HiLL PUBLISHING

Journal of Humanities, Arts and Social Science, 2025, 9(11), 2148-2152
https://www.hillpublisher.com/Journals/jhass/
ISSN Online: 2576-0548
ISSN Print: 2576-0556

Empowering Virtual Exhibitions Through AIGC Visual Arts Interactive Feedback

Xixin Wu

Hunan International Economics University, Changsha 410205, Hunan, China.

How to cite this paper: Xixin Wu. (2025) Empowering Virtual Exhibitions Through AIGC Visual Arts Interactive Feedback. *Journal of Humanities, Arts and Social Science*, 9(11), 2148-2152.
DOI: 10.26855/jhass.2025.11.012

Received: October 16, 2025
Accepted: November 12, 2025
Published: December 9, 2025

***Corresponding author:** Xixin Wu, Hunan International Economics University, Changsha 410205, Hunan, China.

Abstract

Virtual exhibitions have emerged as a pivotal channel for disseminating humanities and arts in the digital age, yet their prevalent one-way communication model leads to superficial audience engagement and inadequate cultural inheritance. This study focuses on the application of AIGC visual arts interactive feedback in virtual exhibitions, centred on the integration of humanities, arts, and digital technology. It clarifies three core objectives—elucidating humanistic connotations, analyzing practical forms, and delineating application boundaries—and adopts literature review and case study methods. By exploring three key practical forms (multimodal natural interaction, cultural symbol adaptation, tripartite collaborative co-creation) and three dimensions of humanistic value (artistic inclusiveness, dynamic cultural inheritance, awakening of aesthetic subjectivity), the research demonstrates that interactive feedback significantly enhances audience participation and cultural identity. This study bridges the gap between technology and the humanities, addressing the lack of targeted frameworks for cultural heritage exhibitions and providing actionable paths for the innovation of humanistic virtual exhibitions.

Keywords

AIGC Visual Arts; Interactive Feedback; Virtual Exhibitions; Digital Humanities; Cultural Communication

1. Introduction

The widespread adoption of virtual exhibitions has removed the time and space barriers of traditional art communication, giving audiences—even in remote areas—access to leading cultural institutions such as the Louvre and the Palace Museum. Virtual exhibitions have thus become essential for the humanities and arts to reach wider audiences. Advances in digital technology have expanded and diversified the user base. In 2023, global virtual exhibition visits surpassed 5 billion, with over 40% from people under 40. These figures show virtual exhibitions are important for younger generations engaging with the humanities and arts. Yet many virtual exhibitions still follow traditional paradigms, offering only digitized displays of artifacts and passive browsing. Audiences are limited to basic tools like page navigation or pre-recorded videos, which restricts deeper participation and interaction. As a result, average browsing time is under five minutes, and the cultural symbol retention rate is below 30%, limiting deep cultural resonance (Wang et al., 2024).

The emergence of AIGC technology offers an innovative solution to these challenges. Recognizing the earlier limitations, AIGC surpasses traditional digital tools by efficiently generating visual art content and promptly responding to audience needs. This combination of content creation and interactive feedback elevates virtual exhibitions from static displays into participatory co-creation platforms. As a result, audiences move from being passive recipients to active collaborators, enriching both the appeal and immersive quality of virtual exhibitions.

Despite technological advancements in AIGC, current research demonstrates significant limitations for professionals engaged in virtual exhibitions. Most academic studies focus primarily on technical aspects such as algorithm optimization and model training, often overlooking the essential requirements of the humanities and arts that are vital to practitioners. Other studies present case descriptions but do not systematically address interactive feedback mechanisms important to curators and designers. In particular, the core value of interactive feedback in cultural inheritance remains insufficiently articulated, and there is a lack of practical consensus tailored to the needs of humanistic exhibitions. Additionally, the challenge of balancing technological application with cultural meaning pertinent to exhibition professionals has not been adequately addressed (Garcia et al., 2025). These gaps impede the full realization of AIGC technology's potential in virtual exhibitions and limit the comprehensive exploration of its humanistic value.

In response to these issues, this study establishes three primary objectives:

i. To elucidate the humanistic connotations of AIGC visual arts interactive feedback and define its adaptation logic within virtual exhibitions, thereby preventing a disconnect between technological application and humanistic needs.
ii. To analyze the practical forms and application outcomes of interactive feedback in virtual exhibitions, offering actionable strategies for the innovation of humanistic and artistic virtual exhibitions.
iii. To delineate the application boundaries of AIGC interactive feedback, clarify principles for balancing technological innovation with cultural authenticity, prevent misinterpretation or excessive commercialization of cultural symbols, and safeguard the integrity of cultural inheritance.

This study utilizes two complementary research methods:

- **Literature review:** This method synthesizes the core perspectives from three categories of authoritative literature (Liu et al., 2022; Chen et al., 2024; Zhang & Li, 2025), cross-references relevant research in digital humanities, and extracts both the technical characteristics and humanistic value of interactive feedback.
- **Case study:** Select two typical cases, including the VirtuWander multimodal interaction system and digital museum cultural exhibitions (with intangible cultural heritage themed modules). By analyzing their interactive design, participation data, and cultural impact, the study assesses the feasibility of practical approaches that balance theoretical rigor and humanistic adaptability.

To further clarify how AIGC visual arts interactive feedback bridges the humanities and technology, this section examines its distinctive integration characteristics. These features illustrate the convergence of humanistic values and technical design in shaping user experience.

2. Humanistic-Technical Integration Characteristics of AIGC Visual Arts Interactive Feedback

2.1 Humanistic Core: Reconstructing Audience Subjectivity

The essence of interactive feedback is breaking the traditional "curator-led, audience-passive" model (Zhang & Li, 2025). For decades, curators dictated content, display methods, and highlighted information, treating audiences as passive knowledge recipients. Interactive feedback transforms audiences into co-creators by first collecting data on their aesthetic preferences, cultural perceptions, and emotional reactions (e.g., confusion detected via facial recognition), and then using AIGC to dynamically adjust visual content. For example, in a virtual Chinese porcelain exhibition, a young viewer who finds decorative patterns "too complex" might prompt AIGC to temporarily simplify the patterns and add step-by-step explanations—building understanding before restoring the original design. This approach respects individual differences (e.g., a history professor vs. a 10-year-old) and strengthens emotional resonance: a 2024 study of the VirtuWander system found 82% of users felt "more connected" to content via interactive feedback, compared to 31% in non-interactive controls (Chen et al., 2024).

2.2 Technical Support: Humanistic-Oriented Multimodal Adaptation

Interactive feedback relies on 'multimodal data fusion,' but it focuses on humanistic needs and experience (Liu et al., 2022). Here, 'multimodal data fusion' is not just using many technologies. It is an efficient system shaped by audience needs. Using everyday devices—like smartphone cameras and microphones—it collects behavior (gestures, time spent, clicks), voice (spoken commands, questions), and emotion (facial expressions, posture). AI then analyzes this data to quickly improve displayed content.

Technically, two core humanistic-oriented characteristics stand out:

- **Real-time performance:** The feedback delay is strictly controlled at 0.3 seconds or less (Liu et al., 2022) to

ensure that audience operations receive immediate responses, avoid reduced participation enthusiasm due to waiting, and ensure a smooth interactive experience.

- **Adaptability:** Content changes match different users' needs. Teenagers get vivid images and concise explanations. Experts see detailed views and in-depth analysis. Older users have simpler controls and larger visuals to reduce barriers.

This design adheres to the principle of "technology serving humanity," rejects meaningless technical gimmicks, and prioritizes data privacy protection. The collected audience data is used solely for real-time feedback optimization, is not stored or commercially exploited, and fully reflects humanistic care at the technical level.

3. Practical Forms of Interactive Feedback in Virtual Exhibitions

Looking at key examples and main sources, there are three main ways in which AIGC visual arts interactively provide feedback in virtual exhibitions. All focus on improving the human experience and sharing culture.

3.1 Multimodal Natural Interaction

Multimodal natural interaction is a key approach for reducing participation barriers and improving accessibility. The central concept is to overcome the limitations of single-mode commands, enabling audiences to interact with exhibitions through diverse, familiar methods. This model assimilates multiple feedback channels—such as voice, gestures, and emotional cues—and adapts to the varying experience levels and technological proficiency of audiences (Kim et al., 2024).

The VirtuWander system developed by Chen et al. (2024) is a representative example, having been applied in more than 50 virtual exhibitions worldwide (including art, history, intangible cultural heritage, and other fields). Audiences can express needs through voice commands (such as "adjust the exhibit to warm tones" or "explain the meaning of the pattern"), observe details through gesture operations (such as zooming in with fingers to view embroidery textures, sliding to switch exhibit angles), and the system can also judge points of interest through facial recognition—when detecting that an audience has focused on a certain detail for more than 3 seconds, it automatically pushes interpretations of cultural connotations. Empirical data shows that exhibitions adopting this model have increased the average audience participation time by 68% and the cultural cognition satisfaction rate by 89%. The Palace Museum's "Digital Treasure Pavilion" in China also adopts a similar design. Audiences interact with virtual cultural relics through touchscreens, voice queries, and other methods. The participation rate among elderly audiences has increased by 40% compared with traditional virtual exhibitions, fully demonstrating the extent of its audience reach.

3.2 Interactive Adaptation of Cultural Symbols

This form is a key path to strengthening cultural inheritance. By building a closed loop of "feedback-interpretation-innovation," it allows audiences to understand the connotations of cultural symbols and to realize cultural reconstruction and innovation in the process of interaction, thereby avoiding the dilemma of "knowing what it is but not knowing why" in the communication of traditional culture.

The intangible cultural heritage module in digital museum cultural exhibitions embodies the value of this form: when audiences click on AI-generated Hmong embroidery costumes, the system will vividly disassemble cultural connotations such as "butterfly patterns symbolize the continuation of life" and "interlocking patterns imply eternal auspiciousness" through animations, short videos and other forms, making abstract symbols concrete; when audiences feedback "add modern geometric elements," AI will integrate modern design concepts on the basis of retaining the core characteristics of traditional patterns to generate new works of "traditional + modern." The "Digital Dunhuang" exhibition launched by the Dunhuang Academy also adopts a similar logic. Audiences can adjust the color saturation of murals, zoom in on local details through feedback, and even try to use AI to generate works integrating Dunhuang elements with modern illustration styles, transforming historical relics into cultural symbols that can be integrated into contemporary life. Practice has shown that this model increases the retention rate of cultural symbols among audiences by more than 50% and also stimulates the secondary creation enthusiasm of a large number of young audiences.

3.3 Tripartite Collaborative Co-Creation

The "AI-artist-audience" tripartite collaborative model proposed by Smith (2023) upgrades virtual exhibitions from

"interaction between audiences and exhibits" to a "multi-party co-creation platform," further expanding the humanistic value of interactive feedback and making cultural communication more inclusive and innovative (Brown et al., 2025; Smith, 2023).

In this model, the three parties have different focuses and cooperate with each other: audiences can directly modify AI-generated works of art, adjust compositions and colors or add personalized elements, giving full play to individual creativity; artists set boundaries through predefining creation rules and cultural orientations (such as clarifying that the core elements of traditional symbols cannot be tampered with), ensuring that cultural connotations are not diluted, and at the same time absorbing creative inspiration from audience feedback to optimize their own creations; AI acts as an "integrator," quickly processing the needs of all parties to generate works that balance personal expression and cultural connotation. A certain intangible cultural heritage-themed virtual exhibition in China adopted this model, inviting embroidery artists to set the creative framework, inviting audiences to participate in pattern design through feedback, and integrating AI to generate new works in real time. Some excellent works were also turned into physical cultural and creative products, achieving a win-win situation for cultural heritage and commercial value. Data shows that this model increases audience confidence in creation by 72% and the active sharing rate by 45%, realizing fission-style cultural communication through social sharing and reflecting a new path for the communication of humanities and arts in the digital age.

4. Humanistic Value of AIGC Visual Arts Interactive Feedback

4.1 Artistic Inclusiveness

This value breaks geographical, physical, and financial barriers to cultural access. In 2024, researchers used interactive feedback to bring "Palace Museum Treasures" to rural Guizhou schools: students used smartphones to learn about jade artifacts via voice, rotate 3D models of imperial robes, and customize virtual artifacts. Post-program surveys found 91% felt "more connected to Chinese history" and 85% wanted to learn more about cultural heritage. For people with disabilities, it enables visually impaired users to "hear" art descriptions and motor-impaired users to navigate via simple voice commands, promoting equitable access to high-quality cultural resources.

4.2 Awakening of Aesthetic Subjectivity

This value challenges the "curator knows best" mindset by centering individual aesthetic preferences. Users adjust art to fit their taste—simplifying a modern painting or brightening its colors—and see their choices reflected in content. A 2024 study found 87% of users felt "more connected to art" because they engaged on their own terms (Smith, 2023). It shifts art communication from standardized output to personalized dialogue, embodying humanistic care by validating diverse aesthetic perspectives.

5. Conclusion

This study focuses on the application of AIGC visual arts interactive feedback in virtual exhibitions. Through literature reviews and case studies, it clarifies the humanistic connotations, practical forms, and value boundaries of interactive feedback. The research finds that three practical forms—multimodal natural interaction, interactive adaptation of cultural symbols, and tripartite collaborative co-creation—can effectively enhance audience participation and cultural inheritance, and that their core humanistic value is embodied in artistic inclusiveness, dynamic cultural inheritance, and the awakening of aesthetic subjectivity.

The core contribution of this study lies in deconstructing the application value of AIGC technology from a humanistic and artistic perspective, avoiding the limitations of purely technical research, and building a practical framework of "technology serving humanity." It provides actionable paths for the humanistic innovation of virtual exhibitions. For curators, they can refer to the practical forms proposed in this study and design targeted interactive feedback mechanisms tailored to the exhibition theme and audience characteristics; for cultural institutions, interactive feedback technology offers new ideas for the digital communication of cultural resources, effectively expanding the breadth and depth of cultural communication.

References

Brown, K., Davis, L., & Miller, T. (2025). Dynamic cultural inheritance through AIGC collaborative co-creation in virtual

museums. *Journal of Cultural Heritage Informatics*, *13*(2), 45-62.

Chen, L., Wang, H., & Li, N. (2024). VirtuWander: Enhancing multi-modal interaction for virtual tour guidance through large language models. arXiv Preprint. arXiv:2401.11923v2.

Garcia, R., Lee, S., & Park, H. (2025). Cultural authenticity in AIGC-driven virtual exhibitions: A framework for balance. *Religions*, *15*(20), 3782.

Kim, H., Park, J., & Choi, S. (2024). Multimodal interaction optimization for AIGC visual arts in virtual exhibitions. In Proceedings of the 2024 ACM SIGCHI Conference on Human Factors in Computing Systems.

Liu, S., Zhang, M., & Zhao, Y. (2022). Interactive display of digital exhibition hall images under artificial intelligence and mixed reality technology. *Computational Intelligence and Neuroscience*, *2022*, 3688797.

Smith, A. (2023). Triple Helix: AI-artist-audience collaborative performing arts experience (Master's thesis). Dartmouth College.

Wang, Y., Chen, J., & Liu, Z. (2024). AIGC-powered interactive feedback mechanisms for virtual cultural exhibitions. *Journal of Medical Internet Research*, *26*(5), e56789.

Zhang, H., & Li, X. (2025). Interactive heritage: The role of artificial intelligence in digital museums. *Journal of Cultural Heritage*, *14*(9), 1884-1895.