Innovation Humanities and Social Sciences Research, Volume 21, Issue 5, 2025. ISSN: 2949-1282
Proceedings of The 10th International Conference on Contemporary Education, Social Sciences and Humanities (ICCESSH 2025)

# Design of AI-Driven Immersive Experiences in Children's Art Education Spaces

Ping Li[1]

[1] *Yunnan College of Business Management, Kunming 650106, China*

**ABSTRACT**

This study aims to explore the application of artificial intelligence (AI) and immersive experience design in children's art education spaces, with the goal of stimulating children's interest, creativity, and artistic expression through innovative interactive experiences. Focusing on the context of "children's art education spaces," this research combines AI technology with immersive design concepts to investigate how digital technology, virtual reality (VR), and augmented reality (AR) can be used to create educational and engaging learning environments. By analyzing the integration of AI and art education, this study proposes an AI-driven immersive experience design framework that enhances the interactivity, sensory engagement, and immersion of art education spaces, thereby improving children's art learning experiences. The results indicate that this technological integration can effectively enhance children's artistic expression, motivation to learn, and in-depth understanding of art, promoting innovative development in children's art education.

***Keywords***: *Artificial intelligence (AI), Immersive experience design, Children's art education spaces, Digital entertainment design.*

## 1. INTRODUCTION

At present, most children's art education spaces still adopt the traditional linear teaching model, which lacks effective stimulation of children's creative thinking and artistic exploration abilities. This model often overlooks the individual needs of children in art education, resulting in art education remaining at the level of skill transmission without fully promoting the diverse development of children's thinking. Creative thinking plays a crucial role in children's growth, especially in the cultivation of logical thinking, problem-solving, and innovation abilities. This study explores how to construct an interactive and creative learning environment in children's art education spaces by introducing artificial intelligence (AI) technology and immersive experience design. By combining AI technology, virtual reality (VR), augmented reality (AR), and other digital means, this study aims to provide a new design framework for children's art education, enhance the interactivity between the space and children, improve children's artistic creativity and cognitive abilities, and offer a more immersive and personalized art education experience for children.

## 2. SPATIAL NARRATIVES AND IMMERSIVE EXPERIENCE DESIGN

Narrative, as a form of expression, aims to construct storylines through abstract concepts and visual elements, thereby enhancing the audience's sense of immersion and engagement. In children's art education spaces, spatial narratives strengthen the emotional expression and storytelling of the space through design elements such as color, lighting, sound effects, and interactive exhibits, allowing children to experience deep interaction with the exhibits and environment. This interaction not only stimulates children's curiosity and imagination but also enhances their immersive learning experience.

According to research in child psychology, children respond more positively to bright and warm colors. Therefore, the design of the "children's art education" space adopts a warm orange tone as the main color, combined with the

design of natural light and indoor lighting, to create an educational environment that is both cozy and vibrant (“Figure 1”). With the introduction of technologies such as virtual reality (VR) and augmented reality (AR), spatial narratives are further elevated. As Professor Xu pointed out, VR provides learners with materials and tutorials from globally outstanding artists and educators, expanding the scope of education and transforming traditional learning environments into immersive innovative experiences (Professor Xu, 2024). This is supported by Professor Liu et al., who emphasize that virtual technology can greatly enhance the creativity and artistic skills of young learners (Professor Liu et al., 2021). Through this technology, students can gain a deeper understanding of artistic concepts and techniques, thereby improving their overall artistic proficiency.

Figure 1 Educational environment.

Moreover, the effectiveness of spatial narratives is not only reflected in visual and auditory stimulation but also in the engagement of touch and smell to deepen immersion. Through this multi-sensory experience, children's emotions and cognition are fully activated, thereby enhancing their memory of the exhibits and space. This design approach differs from the traditional single-space form; it breaks the static model of traditional educational spaces dominated by rectangular boxes and focuses on the interaction between the construction of spatial atmosphere and children's cognitive development. The application of artificial intelligence (AI) in art education also has a profound impact. AI-driven personalized learning experiences meet the subjectivity of artistic expression, enhancing students' participation and motivation to learn (Yang et al., 2023). Wang and Sun pointed out that the combination of AI and art education provides more effective support for students' skill development in subjects such as music and visual arts, thereby forming a more efficient educational framework (Wang & Sun, 2024). With the digital transformation of education, art education must keep pace with technological progress to meet new educational demands (Li, 2023).

With the advancement of digital technology, traditional art education spaces are gradually transitioning to digital and immersive educational environments. The "Children's Art Education" exhibition, through its carefully designed narrative spaces, not only provides children with an interesting and educationally rich learning environment but also brings innovation to traditional educational models. In the exhibition hall design, curved passages and soft gallery arcs avoid the rigidity of traditional right angles, making the space more flexible and suitable for children's physical and mental development. This change in spatial layout not only makes it easier for children to integrate into the exhibition environment but also stimulates their desire to explore and enhances the interactivity of the space. To further enhance parent-child interaction, the exhibition has specially set up a family experience room, which improves the exhibition's sense of hierarchy through parent-child integration design. Through the design of this parent-child interactive space, the exhibition not only enriches children's artistic experiences but also promotes communication and interaction in family education.

Spatial narrative is not only a design technique but also a way of thinking. By employing rhetorical devices such as metaphor and symbolism, it starts from the psychological and cognitive development of children to arouse their interest and guide their active participation in the exhibition. The display of exhibits and spatial narrative interact with each other; together, they construct the context and atmosphere of the exhibits, thereby enhancing the educational attributes of the exhibition. Through hands-on experience and interaction with the exhibition environment, children's cognitive structures are refined, and the educational effects are enhanced.

The "Children's Art Education" exhibition extensively employs digital technologies such as artificial intelligence, virtual reality (VR), and augmented reality (AR). These innovative technologies enable knowledge to be presented more intuitively and provide children with a more

immersive and interactive learning experience ("Figure 2"). This AI-based immersive experience design not only amplifies children's imagination but also cultivates their creative thinking, offering new ideas and directions for the innovation of commercial educational spaces.

Figure 2 A more immersive and interactive learning experience.

## 3. VISUAL PRESENTATION AND IMMERSIVE EDUCATIONAL SPACES

In the design of children's exhibition spaces, designers must be people-oriented, starting from the perspective of children and fully considering their unique needs in perception, cognition, and emotion. By integrating multi-sensory experiences, interactive elements, and vibrant aesthetic elements, exhibits can be made more accessible and understandable to children (Filová & Rollová, 2019; Garip & Evren, 2019).

Incorporating the child's perspective into the design process is crucial to ensure that the space aligns with the children's experience and developmental needs. When designers involve children in discussions about space design, they can more effectively address a range of issues from scale and layout to safety and accessibility (Adiansyah et al., 2023). Through empirical research and the integration of the child's perspective, designers not only confirm children's participation in environmental creation but also innovate in design, balancing functional and emotional needs to ensure that the exhibition is both educational and engaging for children.

The design of modern children's exhibition spaces should integrate technology and digital media to complement physical interaction. Hsu et al. (2018) demonstrated how digital interaction can be combined with traditional exhibition components through mobile game-based hybrid learning services to create immersive learning environments. This technological integration helps extend spatial narratives beyond the physical boundaries of the exhibition, promoting continuous exploration and learning that caters to the needs of today's digitally literate young audience.

The design of children's exhibition spaces should also be based on insights from developmental psychology and cognitive science to optimize spatial and visual elements. Li Li (2023) pointed out that carefully designing spatial themes, color coordination, and functional zoning is crucial for creating an environment that supports cognitive development and promotes emotional health. Applying this approach to exhibition design ensures that every design element—from the layout of exhibits to lighting and interactive technology—can promote the development of children's learning abilities and creativity.

Through the repeated presentation of a large number of visual elements, the exhibition can create a visual exposure effect, enhancing the audience's memory of the exhibition's concepts. In the exhibition, visual design is not only part of the exhibits but also the backbone of the entire storyline, ensuring the unity and rhythm of the exhibition.

In addition to the main visual design, the exhibition also needs to determine the color and graphic design of logos, mascots, promotional materials, and wayfinding systems, building a complete visual communication system. Especially in children's exhibitions, it is necessary to pay special attention to whether the visual design can attract children's interest, avoiding overly complex designs that lead to visual confusion or aversion. At the same time, a unified visual image can enhance the exhibition's brand recognition, reduce unnecessary "noise," and thus improve the signal-to-noise ratio of the visual system.

The "Happy Art Education" exhibition extends the mascot through cultural and creative products at the end of the exhibition hall, providing souvenirs for the audience and giving them away for free. This move not only enhances the exhibition's brand image but also strengthens the audience's emotional connection. In addition, the visual image of the exhibition is centered around timeliness and topicality, promoted through self-media platforms,

and relying on the audience's secondary forwarding to ensure that the exhibition is widely disseminated.

## 4. ARTIFICIAL INTELLIGENCE AND IMMERSIVE EDUCATIONAL SPACES

In children's art education spaces, the core goal of AI and immersive experience design is to provide meaningful virtual experiences through interaction and participation. Digital entertainment design, in this context, infuses exhibitions with emotion and depth by leveraging multi-sensory stimulation, interactive elements, and interdisciplinary integration, thereby enriching the exhibition's connotations and the audience's perception. Digital entertainment not only enhances the exhibition experience in terms of entertainment but also promotes new trends in digital education in the areas of artistic perception and creative thinking. With the development of interactive multimedia technology, exhibitions enhance the audience's experience through personalized design and accessible interaction, especially catering to children's cognitive and sensory development needs.

The introduction of AI and digital technology compensates for the limitations of traditional physical exhibitions in terms of educational value and information delivery. Through sensory stimulation in the space and AI-driven interaction, exhibitions not only enhance entertainment but also break through the constraints of physical space, combining reality with imagination to create a richer and more multidimensional experience. For example, in the "Listen to Colors" section of the "Fun Art Education" exhibition, children wear headphones and identify object types through natural sounds, then proceed to draw and color. This AI-assisted interactive design not only stimulates children's color perception but also promotes the presentation of visual images and the enhancement of logical thinking abilities.

Modern exhibitions are no longer limited to traditional physical displays but have broken through the constraints of exhibition space by using technologies such as virtual reality (VR) and augmented reality (AR) to create more interactive and immersive experiences. Virtual reality technology simulates real-world environments, allowing audiences to receive information and situational awareness in virtual spaces, thereby expanding the forms of exhibition content presentation. In the "Fun Art Education" exhibition, the exhibition space is divided into several thematic units, and the application of digital technology enhances the connections between these units, making the entire exhibition more coherent. For example, the creation room uses AI scanning technology to instantly project children's artworks into virtual scenes, creating a dynamic interactive effect. This is not only a combination of art and science education but also provides children with a space for exploration and creation.

Moreover, the exhibition employs gesture-based interactive technology, enabling children to control screen content through hand movements, which enhances the fun of learning. This interactive design not only promotes emotional interaction between children and the exhibition environment but also strengthens the conveyance of the exhibition's concepts. Through the integration of AI and interactive design, the "Fun Art Education" exhibition has shifted from traditional didactic education to active participation, creation, and exploratory learning. Children not only accumulate knowledge in the exhibition but also enhance their self-learning abilities and artistic perception through hands-on operation and interaction.

To further stimulate children's interest, the exhibition also incorporates interactive elements such as art-based crossword puzzles. Children who successfully solve the puzzles can receive cultural and creative products related to the exhibition theme as gifts. This reward mechanism not only enhances the fun of the exhibition but also encourages children's active participation. Through AI-driven digital entertainment and interactive technology, the exhibition successfully integrates children's creation with educational content, providing them with a challenging and educationally rich immersive learning environment.

## 5. CONCLUSION

Children's art education spaces should not only focus on the fun appearance design but also deeply pay attention to children's emotional needs and cognitive development. With the rapid development of digital technology and artificial intelligence, the application of digital culture in the field of education has gradually been widely accepted and become an effective way to promote educational innovation and the development of the cultural industry. Commercial educational spaces have both cultural and economic attributes, and the cross-border, innovative, and cultural nature of digital technology brings added value to exhibitions, not only meeting the audience's interactive and

entertainment needs but also enhancing the depth and quality of educational content.

The "Fun Art Education" exhibition, by combining AI technology and immersive experience design, has opened up a new direction for the many single art education projects in the market. Starting from the perspective of children, the exhibition explores the deep relationship between spatial environment and education, proving that design should not only serve specific groups but also be humanized according to different ages, classes, and needs. By integrating entertainment design, the exhibition not only enhances its fun and entertainment but also increases its cultural and artistic value, thereby injecting more cultural connotations into commercial activities with economic attributes.

With the gradual maturation of digital entertainment design in our country, we have reason to believe that AI and digital technology will be combined with exhibition design to inspire more innovative possibilities. In the future, digital technology will play an increasingly important role in children's art education spaces, providing children with more immersive, interactive, and creative learning environments, and further promoting the transformation and innovation of education.

## REFERENCES

[1] Xu, B. Practice of digital media art education based on virtual reality technology. Journal of Electrical Systems, 2024: 20(3s), 1714-1723.

[2] Liu, Q., Chen, H., & Crabbe, M. J. C. Interactive study of multimedia and virtual technology in art education. International Journal of Emerging Technologies in Learning (iJET), 2021: 16(01), 80.

[3] Yang, S., Li, S., & Tong, C. The effectiveness of artificial intelligence teaching methods in art subject classrooms. Journal of Artificial Intelligence Practice, 2023: 6(7).

[4] Wang, X. and Sun, X. Construction of an art education teaching system assisted by artificial intelligence. International Journal of Advanced Computer Science and Applications, 2024: 15(2).

[5] Li, J. Research on the development of digitalization of art education in the era of big data technology. Applied Mathematics and Nonlinear Sciences, 2023: 9(1).

[6] Filová, N. and Rollová, L. Human centered design of a children's museum. SWS Journal of SOCIAL SCIENCES AND ART, 2019: 1(2), 67-80.

[7] Garip, S. B. and Evren, G. The effects of interaction and learning styles on children’s experiences in exhibition spaces. A/Z: ITU Journal of Faculty of Architecture, 2019:16(3), 103-114.

[8] Hsu, T., Liang, H., Chiou, C., & Tseng, J. C. R. Cobochild: a blended mobile game-based learning service for children in museum contexts. Data Technologies and Applications, 2018: 52(3), 294-312.

[9] Li, H. Research on educational space design for preschool children. Journal of Theory and Practice of Social Science, 2023: 3(11), 19-27.