

# Children's Learning Experiences in Immersive Museum Art Education: An Observational Case Study

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**Abstract:** This study explores students' learning experiences within an immersive art education environment through an observational case study conducted at the Shandong Museum. Grounded in constructivist learning theory, the research examines how immersive settings influence the learning engagement, peer collaboration, creative expression, and reflective thinking of students aged 9 to 11. Data were collected and analyzed using qualitative research methods, including participatory observation and visual documentation, within a series of immersive art education programs. The findings indicate that immersive learning effectively stimulates students' curiosity, emotional involvement, and collaborative awareness. Students actively engaged in hands-on exploratory activities, demonstrating creative interpretations and personalized understandings of cultural artifacts, and expressed internal reflections through artistic creation. The museum space, enhanced by multisensory stimulation and interactive teaching strategies, was redefined as a student-centered and dynamic learning environment. Furthermore, the study reveals how, under the support of well-designed educational programs, museums can serve as effective platforms for fostering inquiry, interaction, and creativity.

**Keywords:** Art Education, Learning Experience, Museum Education, Immersive Learning.

## 1. Introduction

With the continuous evolution of educational concepts, immersive learning—an instructional approach that emphasizes sensory engagement, contextual construction, and deep experience—has increasingly been integrated into museum-based art education [3]. Compared to traditional lecture-based teaching, immersive learning places greater emphasis on learners' emotional involvement, active exploration, and multidimensional perception, playing a significant role in stimulating students' creativity and critical thinking.

As informal learning environments, museums possess inherent advantages in motivating students, providing authentic contextual support, and enabling interdisciplinary integration [10]. Particularly in the field of art education, museums offer rich visual cultural resources and immersive exhibition spaces that present new possibilities for curriculum innovation [2].

This study focuses on an elementary-level art education program conducted at the Shandong Museum, aiming to examine students' learning experiences from their own perspectives during immersive teaching processes. By organizing and analyzing classroom observation records, this paper seeks to demonstrate how immersive pedagogy influences students' behavioral responses, emotional attitudes, and artistic understanding in real teaching settings.

## 2. Literature Review

### 2.1. The Development and Significance of Immersive Museum Art Education

In recent years, museum education has gradually shifted from a "display–explanation" model centered on knowledge transmission to an "interaction–inquiry" model focused on learner experience. In the field of art education, immersive learning environments are considered effective in enhancing

students' emotional engagement and cognitive depth. Immersive museum education emphasizes situating students in authentic or simulated cultural contexts and stimulating their learning through multisensory inputs—such as visual, auditory, and tactile experiences—to spark curiosity and encourage active participation [11].

Immersive art education extends beyond technological immersion; it centers on the integration of contextual construction, cultural connection, and experiential participation [8]. In such pedagogical practices, students are no longer passive recipients of knowledge but actively construct their understanding of art and culture through observation, experience, interaction, and reflection, thereby achieving deep learning. This approach is particularly significant for children aged 9 to 11, a critical period for both cognitive and emotional development.

### 2.2. Learning Behaviors and Experiences in Museum Settings

Students' learning experiences in museums differ greatly from those in traditional classrooms. Studies have shown that students in museums typically exhibit heightened curiosity and exploratory behavior, with learning becoming more active and collaborative [9]. Scholars such as Falk have proposed that museum environments encourage students to observe, question, compare, and express themselves within authentic contexts, thereby supporting inquiry-based learning [5]. In particular, direct encounters with artworks or artifacts allow students to gain immediate, sensory-rich experiences that, when guided, foster interest and understanding in culture, aesthetics, and history.

Immersive educational strategies—such as role-playing, group tasks, and on-site creative activities—can enhance student engagement and motivation. Students are not merely "seeing" but also "doing" and "speaking," constructing personal meaning and emotional connections within authentic or simulated cultural contexts. This model of "embodied

learning” supports not only cognitive development but also peer collaboration, emotional expression, and social competence.

### 2.3. Observational Methods and the Value of Qualitative Research in Museum Education

Due to the unstructured and situational nature of museum education, an increasing number of studies adopt observational methods to collect behavioral data from students during educational activities [7]. In particular, qualitative observational research captures nuanced behaviors and interaction patterns that emerge in multisensory environments. Through the use of classroom observation forms and photographic documentation, researchers can analyze students’ levels of engagement, emotional responses, problem-solving strategies, and collaborative behaviors [1].

Previous research has indicated that participant observation reveals the immediate effects of teaching implementation, making it especially suitable for studying the learning changes induced by immersive experiences [4]. Unlike interviews or questionnaires, observational methods can provide non-verbal data such as facial expressions, body posture, and eye contact, which are crucial for understanding students’ genuine experiences and reactions in art education processes.

Moreover, observational records offer a solid evidential basis for case analysis, allowing researchers to track the entire learning process and construct a deeper understanding of the underlying learning mechanisms [6]. The combined analysis of visual and textual data further enables a more precise representation of students’ full participation in immersive environments.

### 2.4. Theoretical Foundations and Research Gaps of This Study

Although there is extensive research on museum education and student learning, in-depth observational studies focusing on students’ subjective experiences in immersive art education remain limited. Most existing studies emphasize instructional effectiveness or curriculum design, with a lack of detailed analysis of students’ learning behaviors and perceptual processes. This study employs observational methods as the core research tool, focusing on students’ learning states, observable behaviors, and emotional responses in immersive art courses, aiming to fill the practical gap in immersive art education research.

Furthermore, most existing studies on learning are conducted in formal classroom settings, with relatively few exploring informal learning environments such as museums. This study, through on-site participatory observation of art courses at the Shandong Museum, highlights the situational and experiential characteristics of museum education. It centers on the students’ perspectives to reflect their authentic learning experiences within immersive teaching contexts.

## 3. Methodology

This study employed a qualitative case study approach, focusing on students aged 9 to 11 who participated in an immersive learning program at the Shandong Museum—a stage marked by heightened curiosity and creativity. The primary data sources included eight 90-minute classroom observations and photographic documentation. Observations

focused on student behaviors such as questioning, collaboration, and emotional engagement.

Participant observation was used to capture authentic, real-time interactions in a museum setting—a dynamic and multisensory learning environment distinct from traditional classrooms. Observation forms recorded instructional strategies and student responses, while photographs supplemented the data with visual cues like facial expressions and body language. This approach enabled a nuanced understanding of how immersive teaching influenced students’ engagement and learning outcomes.

## 4. Findings and Analysis

### 4.1. Enhanced Participatory Behavior and Development of Hands-On Skills

In the digital exhibition hall of the Shandong Museum, students actively engaged in self-directed exploration around a large interactive touch screen (Figure 1), demonstrating high levels of motivation and enthusiasm for learning. Through diverse interaction methods such as swiping and tapping, students were able to view high-resolution images and 3D models of artifacts, while also accessing detailed historical and cultural information via audio narration. More importantly, the inclusion of mini interactive games stimulated students’ curiosity and manual skills, effectively narrowing the psychological distance between them and the exhibits, and significantly enhancing their sense of immersion and experiential engagement.

Observation data revealed that students frequently communicated and shared information during the interactive process. For instance, some students eagerly introduced their discovery of “hidden information” to peers, while others organized group members to take turns operating the interactive device, reflecting strong collaborative skills. Students generally reported that the hands-on learning approach was more engaging and effective than traditional lecture-based instruction. As one student remarked, “I love making pottery with my own hands. It feels like I’m drawing just like the ancients did—it’s fun and gives me a great sense of achievement.” Another student excitedly shared, “I found a Triceratops fossil at the simulated excavation site—it felt like I was a real archaeologist!” These firsthand participatory experiences not only enhanced memory retention but also increased learning interest and self-efficacy.



Figure 1. Self-directed exploration

Furthermore, these practical activities fostered social interaction and collaborative learning among students. In the immersive animation experience zone, students watched a video on the ancient process of making black pottery and then simulated the production steps using multimedia tools. This activity transformed students from “passive observers” into “active creators,” enabling them to internalize knowledge and

emotionally resonate with the content through authentic experiential learning.

## 4.2. Emotional Engagement Mechanisms under Contextual Narrative Strategies

In the Ancient Egyptian Civilization Gallery, the teacher skillfully guided students into historical narratives about the lives of pharaohs, burial rituals, and hieroglyphics using vividly illustrated display panels. Acting as a compelling storyteller, the teacher transformed static exhibition content into dynamic historical scenes, evoking strong emotional resonance among the students. Gathered closely around the panels, the students listened attentively, asked thoughtful questions, and demonstrated a high level of interest and emotional engagement in the learning process.

Observation records indicated that during the explanation of the "mummification process," students not only listened carefully but also mimicked the actions illustrated on the panels, reflecting a high degree of involvement. After the session, students continued to engage in active discussions, posing questions such as "Why did the ancient Egyptians preserve the body?" and "If I were a child in that era, would I feel scared?" These reflections not only showcased their capacity for historical thinking but also revealed the development of historical empathy and cultural imagination stimulated by narrative-based instruction.

Further data from the observation sheets showed that students exhibited heightened attention and emotional investment during this session. They frequently asked questions and attempted to paraphrase the teacher's explanations, indicating that the integration of storytelling with contextualization is a highly effective strategy in immersive learning. This approach successfully bridged the gap between knowledge transmission and emotional resonance.



Figure 2. Contextual Narrative

## 4.3. Active Learning Behaviors and Task-Oriented Exploration

In the immersive learning environment of the museum, students demonstrated significantly increased engagement. Through free observation, group collaboration, and hands-on activities, students displayed more dynamic and in-depth cognitive engagement. They were able not only to independently generate innovative ideas and pose targeted questions, but also to attempt solving various challenges encountered in real tasks. Throughout this process, students engaged in deep reflection on their learning experiences, revealing strong intrinsic motivation and a heightened sense of autonomous learning. This proactive learning atmosphere not only facilitated richer interaction among peers and with instructors, but also deepened students' emotional connections with cultural artifacts, thereby broadening and enriching their exploratory learning.

In terms of instructional implementation, the curriculum particularly emphasized the integration of task-oriented learning and role participation. Students were required to collaborate within groups and complete designated "museum exploration tasks" to achieve learning objectives. Each student carried a task sheet, working in groups of three to five to observe, record, and discuss as they navigated the gallery. This design encouraged students to actively engage multiple faculties—visual, auditory, logical reasoning, and artistic literacy—within a real-world context. As a result, students not only improved their comprehension of content but also enhanced group collaboration efficiency in task completion. In practice, students voluntarily rotated roles such as recorder, spokesperson, and observer, ensuring that the learning process remained both goal-directed and flexible. The open-ended and inquiry-based nature of the tasks allowed ample space for students to express their personal interpretations and feelings, fostering personalized learning.



Figure 3. Task-Oriented Exploration

## 4.4. Creative Production and Pathways of Reflective Expression

In the final stage of the immersive museum-based art education program, students were encouraged to present their learning experiences and creative outcomes through reflective expression. This segment served not only as a conclusion to the course but also as a comprehensive assessment of students' cognition, emotion, and creativity. As shown in Figure 4, students exhibited artworks inspired by the "Ya Chou Yue Totem" from the Shandong Museum, including a dress design that incorporated patterns from the African exhibition. These works were not merely products of handicraft, but transformative creations grounded in students' understanding of cultural meanings, reflecting both internalization and reconstruction of cultural significance.

Students' performance during the exhibition segment also highlighted the deepening of reflective learning. Observation records noted: "Students expressed strong self-awareness, aligning their verbal and physical expressions with the aesthetic narrative of their works." They explained the concepts, sources of inspiration, and design processes behind their creations, helping the audience better understand the underlying logic and emotional resonance.

The unique value of immersive museum education is fully realized in this integrative stage. Through engaging in artistic creation and cultural expression, students were internally motivated to communicate. By engaging in reflective expression, they transformed acquired knowledge into personalized experiences, achieving a leap in learning from imitation to creation, and from perception to understanding. This integration of cognition, emotion, and culture represents the core educational objective pursued by this program.



Figure 4. Creative Production

## 5. Discussion

This study highlights how immersive museum-based art education fosters deeper cognitive, emotional, and creative engagement among primary school students. The findings indicate that contextualized narrative strategies, hands-on interaction, and task-oriented exploration work synergistically to enhance student participation and learning outcomes.

First, the integration of digital technology and multisensory interaction in the museum setting significantly improved students' motivation and manual dexterity. Activities such as operating interactive screens or simulating archaeological digs transformed passive viewing into active, embodied learning, reinforcing the constructivist view that knowledge emerges from direct engagement with the environment (Piaget, 1970; Hein, 1998). These authentic encounters narrowed the emotional gap between students and the artifacts, facilitating experiential learning that was both memorable and meaningful.

Second, narrative-driven teaching enabled emotional immersion and historical empathy. By positioning students within cultural storylines, educators successfully created an affective learning atmosphere. This emotional engagement not only supported knowledge retention but also fostered critical reflection and imaginative inquiry, as students related personally to ancient rituals and lifestyles.

Third, task-based group learning encouraged autonomy and social collaboration. Through structured exploration and role rotation, students practiced self-directed inquiry and negotiated meaning collectively. These experiences mirror Vygotsky's (1978) emphasis on the social nature of learning and demonstrate how informal museum environments can cultivate peer learning and adaptive problem-solving skills.

Finally, the creative production phase allowed students to synthesize cultural understanding into personalized artistic expression. Their ability to articulate the symbolic meanings of their artworks during presentations reflects a shift from passive reception to reflective authorship. This transition exemplifies Dewey's (1934) ideal of experiential art education, where the learner becomes an expressive agent capable of generating and communicating meaning.

## 6. Conclusion

This study explored the learning experiences of primary school students within immersive museum-based art education, drawing on classroom observations at the Shandong Museum. Findings indicate that immersive

teaching-through narrative context, multisensory interaction, task-driven exploration, and cultural integration-effectively enhanced students' emotional engagement, cognitive understanding, and creative expression. Students demonstrated increased autonomy, collaboration, and reflection, validating the educational potential of immersive environments to support holistic development. The observational method provided rich insights into authentic learner behavior, affirming the value of museum-based informal education grounded in constructivist principles.

While the study contributes theoretically by linking immersive learning with constructivist educational theory, and offers practical strategies for educators and museums, it remains limited by its small, age-specific sample and short-term focus. Future research should broaden participant demographics, adopt longitudinal designs, and incorporate diverse perspectives from students, educators, and parents. Such efforts can help develop sustainable, collaborative models between museums and schools, paving the way for more inclusive, experiential, and learner-centered approaches in art education.

## Acknowledgments

I would like to thank the educational platform and museum for offering the opportunity and environment to carry out this research. Their openness to knowledge sharing and learning greatly enriched my study experience.

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