

# Enhancing Creativity and Student Engagement in International Art Competitions through Metaverse-Based Art Education

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## Abstract.

This study examines the integration of the Metaverse—specifically through the Spatial platform—into primary school art education and its impact on creativity, engagement, and participation in international art competitions. Virtual art exhibitions featuring award-winning student works were curated to motivate younger cohorts and enhance their artistic development. By leveraging immersive digital environments, avatars, and interactive galleries, students demonstrated increased creative output and stronger motivation to participate in art competitions. Teacher facilitation played a significant role in guiding students through Metaverse-based activities and fostering skill development. The findings indicate that Metaverse integration not only enhances creativity and engagement but also contributes to sustained success in international competitions, thereby strengthening institutional visibility and cultivating early global citizenship.

**Keywords:** Metaverse, Spatial, art education, creativity, engagement, primary school, international art competition

## 1. Introduction

Art education plays a vital role in nurturing creativity, self-expression, and cultural awareness among primary school students. International art competitions provide young learners with valuable opportunities to showcase their talents globally. However, maintaining consistent motivation for creative production remains a significant challenge. The emergence of the Metaverse offers a transformative approach to art education. Platforms such as Spatial allow educators to design immersive virtual galleries where student artworks can be displayed and experienced interactively. By exhibiting award-winning works of older students to younger cohorts, schools can inspire sustained creative engagement and strengthen motivation to participate in both national and international competitions. Since 2021, Mr. Pichai has served as the sole art teacher at Demonstration School of Suan Sunandha Rajabhat University (Primary), teaching approximately 604 students across 20 classes. During this time, he has consistently encouraged participation in art competitions at multiple levels. His implementation of virtual exhibitions on Spatial—featuring winning artworks as exemplary models—has significantly increased students' willingness to submit entries. As a result, the school has achieved a notable rise in awards in recent years. This paper investigates the integration of the Metaverse into primary art education through a case study approach, analyzing its effects on creativity, student engagement, and competition outcomes.

## 2. Literature Review

### 2.1 Metaverse in Education

Recent scholarship identifies the Metaverse as a transformative technology with the capacity to reshape contemporary educational practices. Its immersive, interactive, and collaborative features create learning spaces that mirror and extend real-world environments (Pradana et al., 2023; De Felice et al., 2023). Within these virtual ecosystems, learners engage through avatars, spatial interaction, and gamified elements, which have been shown to enhance presence, motivation, and sustained participation (Islam et al., 2025). Collectively, these studies suggest that Metaverse-based environments provide unique pedagogical affordances that support active and experiential learning.

### 2.2 Art Education and Virtual Environments

Virtual reality (VR) and Metaverse platforms have become increasingly integrated into art education, offering immersive spaces for creation, exploration, and exhibition. These technologies enable digital galleries and virtual studio environments where students can interact with artworks beyond the constraints of physical classrooms (Hwang et al., 2023; Liao et al., 2025). Research shows that such environments promote creativity, broaden access to diverse artistic experiences, and facilitate collaborative learning processes. Additionally, virtual and NFT-based galleries address limitations associated with traditional exhibitions—such as space, cost, or accessibility—allowing artworks to be displayed globally in dynamic and interactive forms (Jin et al., 2023).

### 2.3 International Art Competitions and Student Motivation

Participation in international art competitions offers valuable learning opportunities, including skill development, cultural exposure, and recognition. However, sustaining students' motivation to produce competition-level work remains a challenge. Literature on motivational psychology highlights the influence of peer modeling, wherein observing the achievements of others enhances self-efficacy and encourages effort (Bandura, 1986). Displaying exemplary peer artworks—especially through visually rich, virtual formats—supports observational learning and reinforces students' confidence and aspiration. Integrating virtual exhibitions into art curricula thus aligns with established motivational frameworks, providing accessible exemplars that inspire sustained creative engagement.

## 3. Research Objectives

1. To integrate the Spatial Metaverse platform into primary art education for showcasing student achievements.
2. To examine the impact of virtual exhibitions on students' creativity and engagement.
3. To evaluate the role of teacher facilitation in preparing students for international art competitions using Metaverse-based approaches.

## 4. Methodology

### 4.1 Participants

Participants included approximately 604 primary students (Grades 1–6) from 20 classrooms, along with one art teacher experienced in coaching students for art competitions.

## 4.2 Intervention

Award-winning artworks from previous national and international competitions were digitized and exhibited in a Spatial virtual gallery. Students explored the gallery through avatars, interacted with artworks, and participated in teacher-led discussions.

## 4.3 Activities

Virtual Exhibition Tour: Students explored exemplary artworks. Creative Workshop: Students produced artworks inspired by the virtual exhibition. Peer Sharing: Students uploaded their creations to a separate virtual gallery for peer review. Competition Simulation: A mock art competition was conducted within the Metaverse.

## 4.4 Data Collection

Creativity assessed using the Torrance Test of Creative Thinking (TTCT). Engagement measured through a Likert-scale survey. Qualitative feedback collected via semi-structured interviews. Competition outcomes compared with previous years.

## 4.5 Data Analysis

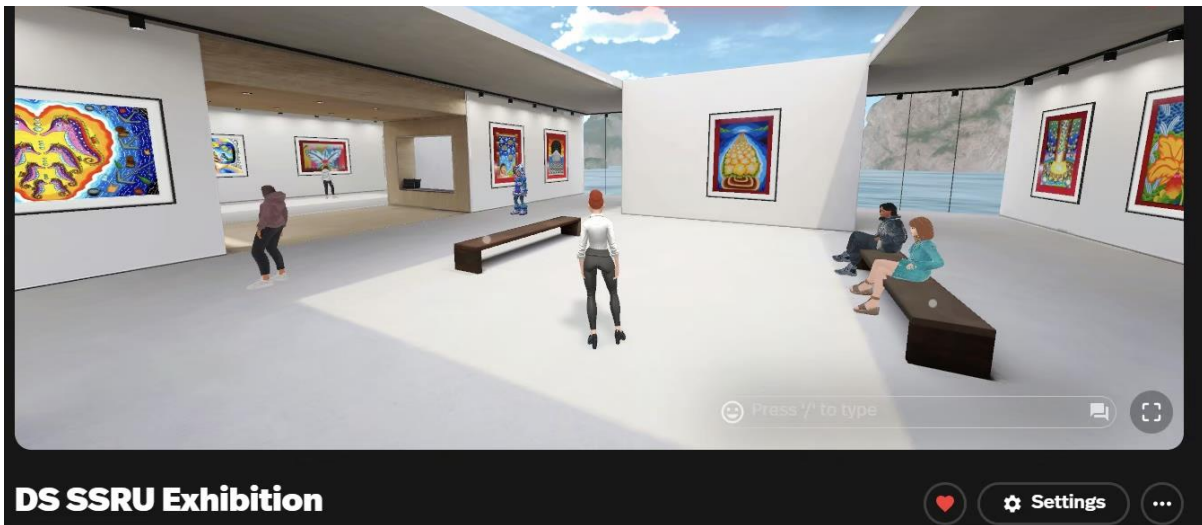
Quantitative data were analyzed using paired t-tests. Qualitative data underwent thematic analysis to identify emergent patterns in student and teacher responses.

**Table 1** Student Engagement Metrics

Metric	Pre-Intervention	Post-Intervention
Creative Motivation	3.1	4.5
Engagement Level	2.9	4.4
Competition Participation	15%	43%

*Figure 1* Example of Spatial Virtual Exhibition



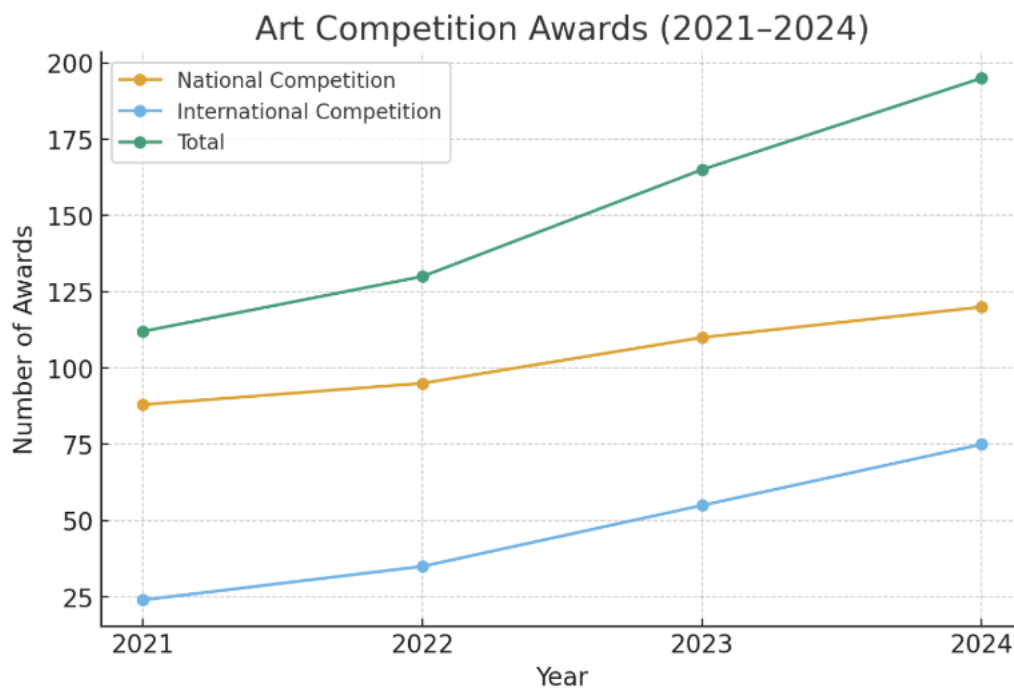


## 5. Results

### 5.1 Summary of Competition Awards (2021–2024)

The school's competition outcomes show a clear upward trend following the integration of Metaverse-based exhibitions.

*Figure 2 the national and international art competition awards (2021–2024)*



These results demonstrate substantial growth, with total awards increasing from 112 in 2021 to 195 in 2024—an overall increase of 83 awards (+74%). Preliminary findings indicate that students exposed to Spatial exhibitions demonstrated higher creative performance compared to those receiving traditional instruction. TTCT scores showed significant improvement in originality, elaboration, and flexibility.

Engagement surveys revealed increased motivation, enjoyment, and willingness to produce artwork for competitions. Students reported that viewing award-winning works inside the Metaverse inspired them to try new techniques and invest more effort into their creations.

Competition data indicated a notable increase in international submissions and awards. Between 2021 and 2024, as Metaverse exhibitions were introduced, the number of awards rose substantially, positioning the school as a leader in international student art competitions.

## **6. Discussion**

The findings suggest that Metaverse integration enriches art education by: - providing immersive artistic experiences, - enhancing student engagement through interactive technology, - offering accessible role models via peer artwork exhibitions, - fostering a supportive environment for creative exploration.

Teacher support proved essential. As the sole art instructor, Mr. Pichai's leadership in utilizing Spatial not only increased students' artistic motivation but also elevated the school's profile internationally.

However, challenges remain, including: - ensuring equitable access to digital devices, - maintaining student data and artwork copyright protection, - sustaining long-term engagement with the Metaverse platform.

Despite these limitations, results align with prior studies showing that immersive technology can significantly enhance creativity and motivation when supported by thoughtful pedagogy (Damaševičius et al., 2024; Liao et al., 2025; Wattanasiripong et al., 2024).

## **7. Conclusion and Future Work**

Integrating Metaverse platforms into art education offers promising opportunities to enhance creativity, engagement, and international competition readiness among primary school students. Virtual exhibitions of award-winning artworks function as powerful motivators and expand the learning experience beyond physical constraints. Future research will include longitudinal tracking of creativity development and multi-school collaborations to examine how Metaverse-based art education supports global citizenship development in the context of international art competitions.

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