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Research Article

2D and 360° Images: Enhancing Interest and Performance Tasks in Contemporary Arts

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ABSTRACT

Contemporary Philippine arts in senior high schools demands innovative approaches to engage students meaningfully. Although virtual reality and 360º videos have been explored in educational settings, limited research has investigated the impact of 360-degree photos, particularly in the context of Philippine Contemporary Arts education. This study addresses this gap by examining the effectiveness of semi-immersive imagery in enhancing student learning. This study aimed to determine the effectiveness of 2D and 360-degree images in improving the learning interest and performance tasks of Grade 12 students in Philippine Contemporary Arts. A quasi-experimental design was employed, involving a control group exposed to traditional 2D images and an experimental group using 360-degree images. Data were collected using pre-tests, post-tests survey which were validated instrument that measured four indicators of learning interest: pleasure, attention, interest, and engagement. Findings revealed that students in the 360-degree group demonstrated significantly higher post-test scores and stronger learning interest across all indicators ($p < 0.05$) compared to the 2D group. Moreover, their performance tasks showed greater improvement, with mean scores increasing from 13.00 ("Good") to 16.00 ("Excellent"). Outputs from the 360-degree group reflected enhanced creativity, spatial awareness, and curatorial thinking. In contrast, the 2D group's work, while technically accurate, less imaginative in depth and showed limited growth. The study affirms the effectiveness of 360-degree photo integration in fostering both cognitive and affective learning outcomes in art education. However, the study is limited in scope, as it involved only one public high school, a specific subject (Contemporary Arts), and a relatively small sample size. Additionally, the intervention period was brief, and long-term retention and applicability across different disciplines were not explored. Despite these limitations, the

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findings provide valuable insights into the use of 360-degree imagery as an accessible and engaging tool for enhancing arts instruction in the Philippine senior high school context.

Keywords: *Virtual Reality, 360-degree images, Student engagement, Art education, Technology in education*

Introduction

The integration of technology in education has fundamentally transformed the ways in which students interact with and absorb learning materials. Digital innovations from interactive multimedia to immersive virtual environments—have shifted traditional pedagogical approaches toward models that prioritize engagement, interactivity, and personalized learning. In the realm of art education, where sensory experience and aesthetic appreciation are paramount, this technological evolution is especially pertinent.

In the Philippine educational landscape, contemporary art has historically been underappreciated. This under-recognition stems partly from limited exposure and the predominance of didactic teaching methods, which fail to capture the dynamism and cultural resonance of Philippine Contemporary Arts. As students in this context often interact with art solely through static images or textbook descriptions, there is a pressing need to revitalize art instruction and foster a deeper, more personal connection with local artistic expressions.

Recent advances in immersive visual technology offer promising avenues for bridging this gap. Among these, 360-degree images have emerged as accessible yet potent tools for creating semi-immersive learning environments. Research indicates that such immersive media can lead to higher levels of student engagement, improved attention, and increased participation in classroom activities. Studies in related fields have demonstrated that immersive visual experiences—whether via virtual reality (VR) or panoramic imagery—can enrich students' learning by providing them with contextualized, multi-sensory experiences that traditional 2D media cannot offer.

This study is underpinned by several theoretical frameworks that emphasize active and experiential learning. Experiential Learning Theory (Kolb, 1984) posits that learning occurs as students encounter and reflect on real-world experiences. By integrating immersive 360-degree images into art instruction, the study leverages this theory to create learning experiences that are both engaging and reflective. Additionally, Technology-Enhanced Learning (TEL) Theory supports the use of digital tools to create interactive, learner-centered educational environments, suggesting that technology can bridge gaps in traditional methods and cater to diverse learning styles.

A comprehensive review of the literature reveals that while there is substantial research on the use of VR and 360-degree videos to enhance educational outcomes, there is a notable paucity of studies focusing specifically on the application of 360-degree photos in art education. Prior research has primarily concentrated on how immersive technologies impact learning outcomes and performance in various subjects; however, the unique potential of 360-degree photos—offering immersive yet accessible experiences without the high cost and technical demands of full VR—remains underexplored, particularly within the context of Philippine Contemporary Arts.

The significance of this study, therefore, lies in its attempt to fill this research gap. By investigating the effectiveness of 360-degree images in enhancing learning interest and performance tasks among Grade 12 students, this study seeks not only to improve the delivery of Contemporary Arts instruction but also to provide empirical evidence that supports the integration of semi-immersive digital tools in the classroom. Ultimately, the findings are anticipated to offer valuable insights for educators and policymakers striving to enrich Philippine art education and stimulate a renewed appreciation for local contemporary arts.

Methods

This research used to a quasi-experimental approach through two groups, a control group who were given traditional 2D images and an experimental group who were provided with 360-degree images. This approach was used to permit comparison between two naturally occurring groups within the school environment where it was not possible to have random assignment. This intervention was carried out to find out the influence of varying levels of visual content on the student's learning interest and performance tasks in Philippine Contemporary Arts.

There were 142 Grade 12 students from Cristobal S. Conducto Memorial Integrated National High School (CSCMINHS) who took part in the study in the academic year 2024-2025. Students belonging to STEM and GAS tracks comprised the population. Intact class sections were assigned into control and experimental groups through cluster sampling to reduce selection bias but maintain classroom dynamics.

To gather the overall data, the study used the following tools:

Pre and Post Assessments. These measured learning interest and performance tasks of students prior to and after the intervention. The content of the test was validated by subject matter specialists and pilot-tested for relevance and clarity.

Survey Questionnaire. A Likert-scale survey was developed based on previously validated instruments (Arliyanti & Kurniawati, 2020) to assess the interest in learning based on four indicators: pleasure, attention, interest, and motivation. The survey provided a Cronbach's alpha internal consistency score of 0.89, reflecting high reliability.

Rubric-Bases Performance Task. Students were assessed via performance tasks in accordance with the DepEd curriculum. A standardized rubric was applied to assess outputs on creativity, conceptualization and artistic implementation. Inter-rater reliability was achieved through calibration sessions with two master-teachers.

Procedure

Both groups received the same content and length of instruction, with the only difference being the method of visual presentation. The control group saw static 2D images, whereas the experimental group engaged with 360-degree images through mobile devices, laptops and classroom televisions. Pre-assessments were given before the intervention, followed by five-weeks of visually based instruction, ending with post-assessment and performance tasks presentation. To counter possible biases, teachers were unaware which students were in the control or experimental group when grading the performance tasks. The same teacher taught the two groups with ready-made lessons to ensure instructional consistency. Environmental conditions such as setting, equipment, duration were maintained equal for both groups.

Data Analysis

Quantitative data were processed using descriptive statistics (mean, standard deviation) to report learning interest and performance scores. An independent samples t-test was used to establish significant differences between the control and experimental groups at a significance level of $p < 0.05$.

Findings on Learning Interest

The comparison of pre and post intervention results indicated a significant increase in the learning interest of learners who were exposed to 360-degree images. The experimental group had consistently higher attention, engagement, pleasure, and interest in Philippine Contemporary Arts than the control group. These results are graphically presented in Figure 1, and it shows the difference in levels of learning interest between the two groups.

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
2D Photos								
Feeling of Pleasure	-.01408	.98275	.11663	-.24670	.21853	-.121	70	.904
Student Interest	-.17606	1.08778	.12910	-.43353	.08142	-1.364	70	.177
Student Attention	-.14429	.81754	.09702	-.33780	.04922	-1.487	70	.141
Student Engagement	-.18451	1.00380	.11913	-.42210	.05309	-1.549	70	.126
360° Photos								
Feeling of Pleasure	-.44085	.87122	.10339	-.64706	-.23463	-4.264	70	.000
Student Interest	-.47324	.91370	.10844	-.68951	-.25697	-4.364	70	.000
Student Attention	-.54523	.89715	.10647	-.75758	-.33287	-5.121	70	.000
Student Engagement	-.44648	1.00140	.11884	-.68351	-.20945	-3.757	70	.000

Legend: Sig. (2-tailed) < 0.05 – Statistically Significant Difference; Sig. (2-tailed) ≥ 0.05 – Not Statistically Significant

Figure 1. Test of Difference 2D photos and 360° photos

This result validates the assertion of researchers like Radianti et al. (2020), who established that interactive visual aids like 360-degree formats promote increased learner engagement by mimicking real life experiences. Utilizing 360-degree imaged presented a more interactive setting that piqued the interest of students and evoked an emotional response to the material, which 2D images could not attain.

Findings on Academic Performance

Performance tasks were assessed based on a standardized rubric covering creativity, conceptual understanding and critical analysis. As shown in Figure 2, students in the experimental group achieved higher mean scores than those in the control group.

	Before			After		
	Mean	**SD**	**VI**	**Mean**	**SD**	**VI**
2D photos group	14.18	.990	Excellent	15.00	.000	Excellent
360°photos group	13.00	.000	Good	16.00	.000	Excellent

Legend:*14-16 (Excellent); 11-13 (Good); 8-10 (Satisfactory); 5-7 (Below Average); 0-4 (Poor)*

Figure 2. Student Performance Tasks Before and After Using 2D & 360°Photos

This demonstrates stronger artistic expression, spatial awareness, and the ability to interpret and contextualize artworks. The consistent improvement among students in the experimental group is significant: all participants attained "Excellent" rating in post task performance, and a standard error of 0 indicated uniform mastery across the group. This finding reflects the assertion of Mayer's Cognitive Theory of Multimedia Learning (2005), which emphasizes that dual-channel processing (visual + spatial) can improve conceptual understanding and retention, evident in the students' enhanced creative outputs.

Comparative Analysis

A t-test comparison verified a statistically significant difference in post-test between the

control group and experimental groups (t=-6.952, p < .000). The control group made modest gains, whereas the experimental group made significant improvement, supporting the efficacy of 36-degree photos in enhancing learning interest as well as academic achievement.

Independent T-test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
2D photos	-.817	.990	.118	-1.051	-.583	-6.952	70	.000

Legend: Sig. (2-tailed) < 0.05 – Statistically Significant Difference; Sig. (2-tailed) ≥ 0.05 – Not Statistically Significant

Figure 3. Test of Difference in the 2D photos and 360-degree photos group

This is in agreement with research by Huang et al. (2021) which established that semi-immersive tools such as 360-degree images fill the middle ground between availability and interaction. Compared to virtual reality, which uses costly equipment, 36-degree images are an affordable and cos-effective strategy for resource-constrained schools.

Conclusion

This research finds that incorporating 360-degree images in Philippine Contemporary Arts education improve students' interest in learning and performance activities greatly. The interactive nature of such images leads to higher concentration, richer appreciation, and greater creativity than in 2D materials. As the results are statistically significant (p-values =0.000), teachers are advised to use 36-degree photos more frequently in related school subjects to enhance teaching. Students are similarly encouraged to review such content while working on projects and performance tasks to extend their own knowledge and artistic expression. Although the results are encouraging, the small scope of the study, examining only one subject area, in one school environment, for a brief intervention period raises the need for additional investigation. Long-tern influence of 360-degree imagery may be conducted for its effect on creativity, critical thinking, and academic motivation among different educational setups in future studies.

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