

Artificial Intelligence-Assisted Art Education Foster Student Inclusion and Engagement: Opportunities and Challenges

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Abstract

Today, creative education is increasingly shaped by Artificial Intelligence (AI) and is opening up new possibilities for personalized education, accessibility and student participation. This research study explored how AI-enhanced art education can help foster student inclusion and engagement and revealed the problems with using AI in visual arts classrooms. The quantitative cross-sectional survey design was used and data was gathered from 200 art education students, teachers and art instructors from the National College of Arts (NCA), the Indus Valley School of Art and Architecture and the Karachi School of Art. with a structured questionnaire. Descriptive statistics, reliability analysis, correlation and regression analyses were performed. The findings indicated positive perceptions of AI-assisted art education, student engagement, and student inclusion. All internal consistency measures were satisfactory, showing excellent Cronbach's alpha values through reliability analysis. The regression results indicated that there was a significant prediction of student inclusion by AI-assisted art education and of student engagement by AI-assisted art education. Other important implementation barriers that were identified were teacher training and technical difficulties. The researchers draw a set of conclusions regarding the use of AI in art education. The study's researchers offer a series of conclusions about how AI can be used in art education to create inclusive and engaging learning environments.

Keywords: Artificial Intelligence, Art Education, Student Inclusion, Student Engagement, Educational Technology, Inclusive Learning, AI Integration, Creative Learning

1. Introduction

Artificial Intelligence (AI) has rapidly emerged as an important educational technology that is reshaping teaching, learning, assessment, feedback, and student support. In recent years, AI tools have been adopted in the education sector to better tailor learning experiences, provide automated feedback, help with engagement and support teachers in creating more responsive learning experiences (Garzón et al., 2025; Zhang & Zhang, 2024). AI technologies are also increasingly impacting the creative and visual learning domains, such as visual arts and art education. Students can now investigate art concepts, develop visual ideas, play with styles and be supported as they create (Denny et al., 2024; Olga et al., 2023).

In art education, AI-assisted tools can provide new opportunities for creativity, experimentation, and participation. Students who struggle with traditional drawing or visualization or technical art production may utilize AI tools to generate ideas, to visualize concepts or to become more confident in engaging in artistic activities (Sánchez, 2025; De Eguino, 2025). AI can also be used to assist the varied learner through personalized guidance, multimodal learning resources, assistive features, and expression flexibilities. Recent research related to AI and inclusive education has indicated a potential for enhancing various aspects of accessibility and engagement for learners with diverse abilities, backgrounds, and learning styles (Chalkiadakis et al., 2024; Li et al., 2025).

The classrooms today encompass students with a variety of abilities, languages, cultures, learning styles and socio-economic conditions, making inclusion and accessibility a central issue in contemporary education. The principle of inclusive education is that of equal participation, equal access to learning resources and class environments supporting all children. However, in this context, AI-powered art education could play a role in making classrooms more accessible for all students by minimizing participation obstacles and allowing students to express themselves through various digital forms (Salas-Pilco et al., 2022). But researchers caution that AI is not a panacea for inclusion in education. New forms of exclusion can arise through the misuse of AI tools, particularly due to digital divide, algorithmic bias, inadequate teacher training, insufficient infrastructure, and ethical considerations (Bulathwela et al., 2024).

While AI is taking on a larger place in educational contexts, its application in art education, and then in student inclusion, is under-explored. Creativity and accessibility benefits, along with increased participation and confidence in the classroom for a wide range of learners, are possibilities with AI-assisted art tools. However, empirical evidence for the effectiveness of these tools in student inclusion in art education remains limited (De Eguino, 2025). The adoption of AI-driven art learning resources is also hindered by challenges such as a lack of training, digital resources, and ethical considerations, along with a conflict between human creativity and machine-generated art support. Therefore, there is a need to investigate both the opportunities and challenges associated with AI-assisted art education in promoting inclusive learning environments.

2. Research Objectives

1. To examine the level of AI-assisted art education, student inclusion, student engagement, and challenges associated with AI integration in visual arts education.

2. To determine the relationship between AI-assisted art education and student inclusion in visual arts learning environments.
3. To investigate the predictive effect of AI-assisted art education on student engagement and examine the challenges associated with AI integration in visual arts education.

3. Research Questions

1. What are the levels of AI-assisted art education, student inclusion, student engagement, and challenges associated with AI integration among art education students and instructors?
2. What relationship exists between AI-assisted art education and student inclusion in visual arts education?
3. To what extent does AI-assisted art education predict student engagement, and what challenges are associated with the integration of AI-based tools in visual arts education?

This research is important because it helps advance the knowledge and understanding of the use of AI in art education and the connection between such use and student inclusion. It could guide teachers in understanding the potential of AI tools to serve the needs of a diverse student body, enhance engagement, and foster creativity within art classrooms. The study also benefits students as it sheds light on opportunities for the accessible and technology-enriched learning environment of art. For policymakers and educational leaders, the study provides insights into inclusive educational practices and the responsible integration of AI technologies in creative learning environments. This study can contribute to promote the effective, ethical, and inclusive implementation of AI in art education.

4. Literature Review

4.1. Artificial Intelligence in Education

Artificial Intelligence is the application of computer systems that are capable of carrying out tasks that would typically be done by a human person, including problem-solving, decision making, feedback generation, pattern recognition and adaptive response. AI is being leveraged in education for various purposes, such as assistance in teaching, learning, evaluation, managing classroom activities, and advising students. AI-driven educational tools have been found to tailor learning experiences, offer real-time feedback, detect learning gaps, and enhance student engagement in their learning (Ali et al., 2024; Garzón et al., 2025; Adeleye et al., 2024). Examples of AI use in education involve intelligent tutoring systems, learning analytics, automated assessment systems, adaptive learning platforms, chatbots, generative AI tools, and assistive technologies. According to Zhang and Zhang (2024), AI can assist teachers in several areas such as classroom management, digital literacy, inclusive learning, and student-centered teaching. While there is a technological aspect to AI-supported teaching and learning, there is also a pedagogical, ethical, and teacher readiness aspect that must not be overlooked (Adeleye et al., 2024).

4.2. AI-Assisted Art Education

AI-assisted art education is the application of artificial intelligence (AI) tools and systems to enhance artistic learning, visual creativity, artwork appreciation, design thinking and creative expression (Sánchez, 2025). AI applications can be used in art education for image generation systems, deep learning for analyzing artwork, digital drawing, virtual art applications, generative design, and AI feedback systems (Ke, 2023; Zhanguzhinova, 2024; Yiyi, 2025). The tools enable students to brainstorm artistic concepts, develop visual ideas, play with color and composition and gain immediate feedback during the creative process. Chiu et al. (2022) created an art learning system that employed deep learning techniques, and revealed that the artwork appreciation, learning motivation, self-efficacy, technology acceptance, and painting performance of university students were positively affected by AI-supported art learning. Likewise, Lim et al. (2023) stated that AI could be a relational artifact in creative learning, not a replacement for human creativity, when students are using AI as a collaborative partner. Recent research also indicates that using AI to assist in art education fosters co-creation, experimentation, and creative problem-solving in interactive digital spaces (Evangelidis et al., 2024; Rong et al., 2025; Cai, 2025). AI in art education is personal, interactive, experimental, multimodal, and offers immediate learning assistance (Chen et al., 2025; Zhang et al., 2025).

4.3. Student Inclusion in Education

Student inclusion is the practice of providing access to meaning in learning opportunities for students of all abilities, backgrounds, languages, genders, culture, disability and socio-economic status (Jamal & Iqbal, 2023). All the elements of inclusive education are around the themes of participation, accessibility, equity and respect for learner diversity. Importance of inclusion in modern educational system: In today's education, the classroom is increasingly diverse, and the traditional teaching method may not be able to fully cater to the needs of all students. Inclusive learning environments offer flexible educational practices, accessible materials, supportive teacher relationships and opportunities for all students to be actively involved in learning. For instance, recent studies indicate that the use of AI and emerging technologies can help foster inclusion by providing assistive technologies, customized learning paths, language assistance, adaptive feedback, and alternative modes of communication (Chalkiadakis et al., 2024; Li et al., 2025; Adeleye et al., 2024; Davoodi, 2024). Incorporating AI into the classroom, however, requires ensuring equitable access, culturally responsive design, teacher training, and ethical implementation. AI-driven educational frameworks have also been shown to enhance the accessibility and learning opportunities for multilingual and diverse learners (Davoodi, 2024; Kotsidis & Dima, 2025).

4.4. Student Engagement

Successful learning is dependent upon student engagement, which is manifested in three components: behaviour, cognition and emotion. Behavioral engagement is when students are actively involved in the activities they do in the classroom, completion of tasks, attendance, and engagement in learning processes (Zhang et al., 2025). Cognitive engagement is the thinking work students do in solving problems, considering and reflecting, and wanting to understand concepts well. Emotional engagement involves pupils' interest, enjoyment, motivation, confidence and

sense of belonging in the classroom (Cano, 2022). In AI-supported learning, engagement can be enhanced by providing personalized feedback, interactive learning support, creative stimulation, and opportunities for self-directed exploration. Lin and Chen (2024) revealed that AI can lead to more engaging and creative learning experiences through features such as interactive elements, individualized feedback, and innovative problem-solving strategies. The study also pointed out that there is a potential for emotional distancing, anxiety, or frustration when the AI interaction is a repetitive, impersonal, or technically challenging experience for students. The adoption of AI for art education will rely on the teachers' ability to combine AI tools with human creativity and support. AI's potential to foster critical thinking, collaborative creativity, and sustained engagement among learners has also been demonstrated in studies focused on art education, where its integration is carefully managed and leverages the unique characteristics of creative learning activities (Park, 2023; Evangelidis et al., 2024).

4.5. Opportunities of AI-Assisted Art Education

There are a number of ways that AI can be used in art education that can include students and enable creative learning. First, AI can provide personalized learning experiences by providing individual feedback, adaptive support, and flexible pathways based on students' abilities and learning needs. Second, it enables creative exploration and expression by letting learners experiment with ideas, explore artistic styles and visualize abstract concepts. This works well for learners who find it difficult to execute traditional art skills, but have good creative concepts. Third, AI can improve accessibility by offering multimodal resources, assistive features and other means of engaging in visual art activities. Fourth, AI can enhance student engagement by minimizing risks and fostering experimentation. Fourth, AI can help to make students feel more at ease and less afraid of failure, and allow them to experiment more. Fifth, AI can assist with a wide range of learning requirements, providing students with the flexibility of their pace, learning style, and expression. While the potential for technology and AI to enhance performance, engagement, and interest in diverse and minority students exists, technological and pedagogical barriers have been identified by Salas-Pilco et al. (2022). In the art education classroom, these opportunities could support the development of more inclusive classrooms that allow students to participate as they are able. Recent reviews have also pointed out that generative AI applications have been found to assist creative exploration, co-creation, accessibility or personalized artistic learning experiences (Rong et al., 2025; Evangelidis et al., 2024; Yiyi, 2025; Chen et al., 2025).

4.6. Challenges of AI Integration in Art Education

While AI has the potential to transform art education, there are some challenges that need to be addressed. Technical constraints are the lack of reliable output, lack of contextual knowledge, software bugs, reliance on the internet, and inability to produce culturally or artistically consistent results (Evangelidis et al., 2024). Another significant obstacle is the lack of teacher training and digital literacy, as some teachers might not be knowledgeable about the effective use and assessment of AI-powered art tools. Ethical concerns exist regarding academic dishonesty, and authorship and originality, copyright, data privacy, algorithmic bias, and reliance on AI-generated images. Another factor is the availability of resources, particularly in under-resourced schools where they may lack devices, internet or paid AI platforms for students to use. The fear of technological change resistance may also emerge when some teachers, parents, and institutions

may be afraid that artificial intelligence will reduce the importance of creativity or art skills. Ali et al. (2024) amalgamated the following as critical issues for the education sector when it comes to adopting AI: ethical, technological, operational, user-related, and environmental concerns. There have been some similar problems in art education that have been debated about originality, artistic authenticity, excessive dependence on AI-generated art, and the integration of human creativity and machine assistance (Ke, 2023; Park, 2023; Zhang et al., 2025; Zhanguzhinova, 2024). So, the integration of AI should be done carefully, as it is a tool for support and not a replacement for teacher guidance and creativity.

4.7. Empirical Review of Related Studies

Research from around the world shows that the world is becoming more interested in AI integration in educational settings. Garzón et al. (2025) in a systematic review, found that since 2022 the use of AI in the sector of education has experienced a significant explosion and is associated with personalized learning and motivation, digital dependency and ethical issues. A review by Li et al. (2025) revealed that empirical studies from the period between 2020 and 2025 showed potential for positive applications of AI in personalization, accessibility and engagement in inclusive education, but emphasized the need for appropriate infrastructure and digital competences. The researchers Chalkiadakis et al. (2024) also claimed that AI and virtual reality technologies can help with the accessibility and social inclusion of students with disabilities. Chiu et al. (2022) demonstrated that the application of the AI to support the students' learning of art greatly improved the outcomes of the students' art achievement, motivation and painting results in art education. Ansone et al. (2025) reported that art students reported benefiting from generative AI when it came to ideation and conceptualization, but not for developing more refined art. AI can be a helpful partner to inspire students to experiment with various artistic styles, as demonstrated by Lim et al. (2023). There have been numerous studies that examined general studies on AI in education, creative applications of AI and inclusive technologies, but few studies that examined the relationship between AI in assisted art education and student inclusion quantitatively.

4.8. Theoretical Foundation

The Technology Acceptance Model (TAM) and Inclusive Education Theory can be used to guide this study. TAM theorizes user acceptance of technology by perceived usefulness and perceived ease of use. The use of AI-supported art tools in this study is relevant because student and teacher acceptance of this technology could be influenced by the perception of usefulness, accessibility, ease of use, and advantages of using AI in art. Chiu et al. (2022) also correlated the use of AI to support students' art learning with the acceptance of technology and learning outcomes. Inclusive Education Theory principles are Equality of access, Participation, Respect for diversity and removal of barriers in learning environments. It facilitates thinking that educational technology should be designed and developed to suit the needs of all learners, such as those with special abilities and learning needs. The theories provide a strong foundation for understanding the potential of AI support in the field of art education for fostering inclusive practice and the associated challenges.

4.9. Conceptual Framework

The conceptual framework in this study depicts how AI support for art education relates to student inclusion, student engagement, and challenges of using AI in art education. In this paradigm, the independent variable is AI-assisted art education which is the key teaching and learning paradigm in visual arts education (Del Pino Santana Domínguez, 2022). This involves the use of AI tools in digital creativity, artwork creation, feedback, customized learning, and artistic exploration (Sánchez, 2025).

Student inclusion and student engagement are the dependent variables. Student inclusion means making all students, including diverse learners, accessible, participating and equally learning in art education. Engagement of students can be defined as students' cognitive, behavioural and emotional involvement in art learning activities. The framework takes for granted that AI-supported art education can help enhance student inclusion by making art education more accessible and flexible. Greater inclusion could also help to further increase student engagement as students feel included are more likely to actively engage in learning, think creatively and emotionally interested in learning. There's also a challenge dimension in the framework. There are potential challenges to implementing AI, such as access challenges, training requirements, technical constraints, and ethical concerns that could affect how AI is used in the arts education.

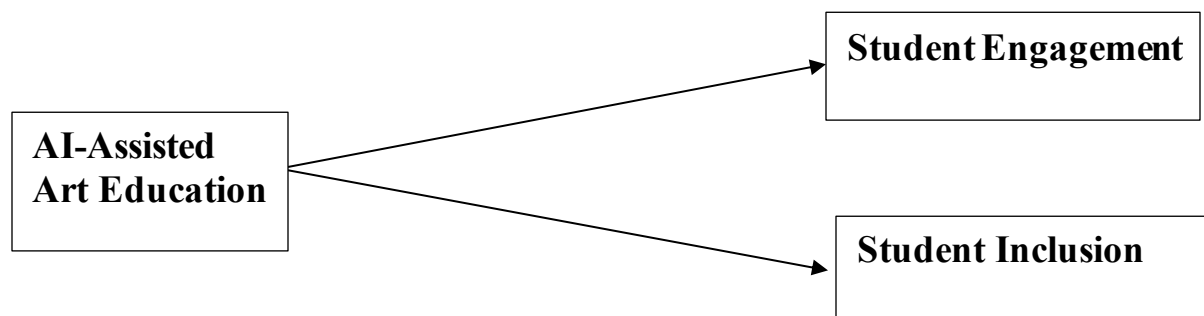


Figure 1. Conceptual framework showing the relationship among AI-assisted art education, student inclusion, student engagement, and challenges of AI integration.

4.10. Hypothesis of the Study

- H1: AI-assisted art education has a significant positive effect on student inclusion in visual arts education.
- H2: AI-assisted art education has a significant positive effect on student engagement in visual arts education.

4.11. Research Gap

Despite the recent boom in studies on AI in education, AI supported creativity, and inclusive educational technology, few quantitative studies have explored the connection between AI-assisted art education and student inclusion. Most of the studies that can be found deal with general classrooms, teacher preparation classes or classes for special need students, with fewer studies dealing with visual arts classrooms (Del Pino Santana Domínguez, 2022). In addition, there has been minimal research on the opportunities and challenges of AI-infused education of art for access, participation, engagement and differentiated learning needs. The significance of this study lies in its exploration of the impact of AI in art education on student inclusion and the potential hurdles for educators and students as they adopt AI-based tools in the visual arts education environment (Cano, 2022). Hence, this study aims to fill an important research gap, by investigating the role of AI in education and its application for supporting student inclusion and the challenges faced by educators and students when applying AI-based tools in the visual arts education context.

5. Methodology

5.1. Research Design

This study used a cross-sectional quantitative survey research design to investigate the role of artificial intelligence assisted art education for enhancing student inclusion, engagement and participation in visual arts learning environments. The quantitative approach was deemed appropriate because the study employed numerical data to measure participants' perceptions and explored the correlation between AI-assisted art education, student inclusion, student engagement, and the challenges faced by the integration of AI. The cross-sectional design was suitable since the data was gathered from the respondents at one time.

5.2. Population

The population in the study comprised art educators, art education students and university instructors who teach visual arts the National College of Arts (NCA) in Lahore and Rawalpindi, the Indus Valley School of Art and Architecture in Karachi, and the Karachi School of Art. The selected participants had either direct or indirect experience in art learning, in digital creation, in visual arts teaching, use of AI-based tools in visual arts learning. The population consisted of students from Universities/Institute/College providing art, design, visual communication, fine arts and allied creative education programs.

5.3. Sample

A total of 200 persons were part of the study. The respondents for the sample consisted of art educators, art education students and university instructors from selected universities and colleges. It was believed that this was a sufficient sample size for quantitative data collection and to provide descriptive analysis, correlation and regression analysis. Both teachers and students were included in the study, contributing to a perspective on AI-assisted art education from the perspective of teaching and learning.

5.4. Sampling Technique

A stratified random sampling technique was employed in the study. The participants were divided into different strata, such as art educators, art education students, and university instructors. Following the formation of these strata, participants from the universities/colleges that provide art and design courses were randomly selected. The sampling method used ensured a fair representation of all groups that are engaged in visual arts education, which also minimizes the chances of selection bias.

5.5. Research Instrument

Data were collected through a structured questionnaire. The questionnaire was divided into five sections. Demographic data such as gender, age, academic qualification, institutional affiliation, teaching/learning experience were gathered in Section A. In Section B, AI-assisted art education, AI tools used in art education, perceived usefulness, and frequency of use were assessed. Student inclusion were assessed in Section C on accessibility, participation and equal learning opportunity. Student engagement, measured in terms of cognitive engagement, behavioral engagement and emotional engagement, was the topic of Section D. Section E focused on the challenges associated with AI integration, such as technical hurdles, ethical concerns, training challenges, and resource limitations. All items were rated using a five-point Likert scale, with 1 indicating strongly disagree, 2 disagree, 3 neutrals, 4 agree and 5 strongly agree.

5.6. Validity and Reliability

The questionnaire was expert reviewed to ensure its validity. The questionnaire was reviewed by experts in education, art education, educational technology and research methodology to check the relevance, clarity and appropriateness of the items. They were asked to make suggestions about this which were taken into consideration prior to the final data collection. A pilot test was also done with a small number of respondents to test the clarity and reliability of the instrument. Cronbach's alpha analysis was used to measure reliability. The acceptable alpha value was used as an indicator of internal consistency among the items of the questionnaire.

5.7. Data Collection Procedure

Before data collection, formal permission was taken from the selected Universities and Colleges. Following institutional approval, the questionnaires were sent to the selected participants sent through online. The respondents were fully informed of the purpose of the study and their voluntary participation in it. Completed questionnaires were picked up and carefully checked for missing or incomplete items and for response errors. Finally, only those questionnaires that were properly completed were used in the data analysis.

5.8. Ethical Considerations

Strict ethical principles were adhered to throughout the study. All participants were informed and gave consent prior to data collection. The study was conducted based on voluntary participation and respondents could withdraw at any time. Personal identifying information was not collected,

thus maintaining confidentiality and anonymity. Data was collected solely for academic and research purposes.

5.9. Data Analysis Techniques

The data collected was analyzed using statistical procedures. The characteristics of the respondents and study variables were summarized by descriptive statistics. To determine the level of responses, the mean and standard deviation were calculated. Demographic data was analyzed using frequency and percentage calculations. Relationships were analyzed by correlation analysis between AI assisted art education, student inclusion, and student engagement. A regression analysis was used to test the predictive effect of the AI-assisted art education on the inclusion and engagement of students, and to investigate the challenges arising from the integration of AI in art education.

6. RESULTS

6.1. Demographic Characteristics of the Participants

Table 1: Gender Distribution of Respondents

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Male	92	46.0	46.0	46.0
Female	108	54.0	54.0	100.0
Total	200	100.0	100.0	

Table 1 shows a gender distribution of the respondents: Males = 92 (46%), Females = 108 (54%). From these results, it can be concluded that females were in the majority.

6.2. Descriptive Statistics of the Study Variables

Table 2: Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation
AI-Assisted Art Education	200	2.10	5.00	4.08	.61
Student Inclusion	200	2.25	5.00	3.95	.66
Student Engagement	200	2.30	5.00	4.02	.64
Challenges of AI Integration	200	1.80	5.00	3.48	.73
Valid N (listwise)	200				

These findings suggest that AI-Assisted Art Education has an overall positive reception, with a highest mean score among other categories ($M = 4.08$, $SD = .61$). Student Engagement ($M = 4.02$, $SD = .64$) and Student Inclusion ($M = 3.95$, $SD = .66$) were ranked equally. The challenges associated with AI Integration indicated a neutral mean score ($M = 3.48$, $SD = .73$).

6.3. Reliability Analysis

Table 3: Reliability Statistics

Variable	Cronbach's Alpha	N of Items
AI-Assisted Art Education	.892	8
Student Inclusion	.874	8
Student Engagement	.901	9
Challenges of AI Integration	.856	8

The reliability analysis revealed acceptable internal consistency across all constructs. As all measuring scales demonstrated the values of Cronbach's Alpha in the range of .856 to .901, which is significantly above the suggested value of .70, the measuring scales were considered reliable.

6.4. AI-Assisted Art Education and Student Inclusion

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of Estimate
1	.682a	.465	.462	.485

6.5. Predictors: (Constant), AI-Assisted Art Education

Table 5: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	40.548	1	40.548	172.13	.000
Residual	46.640	198	.236		
Total	87.188	199			

Table 6: Coefficients

Model	Unstandardized B	Std. Error	Beta	t	Sig.
Constant	1.104	.225		4.91	.000

AI-Assisted Art Education	.698	.053	.682	13.12	.000
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Regression showed that AI-Assisted Art Education was a strong positive predictor of Student Inclusion ($\beta = .682$, $p < .001$). The model accounted for 46.5% of the variance in Student Inclusion ($R^2 = .465$).

6.6. AI-Assisted Art Education and Student Engagement

Table 7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error
1	.741a	.549	.547	.431

Table 8: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	43.942	1	43.942	236.24	.000
Residual	36.827	198	.186		
Total	80.769	199			

Table 9: Coefficients

Model	B	Std. Error	Beta	t	Sig.
Constant	.921	.206		4.48	.000
AI-Assisted Art Education	.758	.049	.741	15.37	.000

AI-Assisted Art Education significantly predicted Student Engagement ($\beta = .741$, $p < .001$). The model explained 54.9% of the variance in Student Engagement.

6.7. Challenges Associated with AI Integration

Table 10: Descriptive Statistics of Challenges

Challenge Factors	Mean	Std. Deviation
Teacher Training Issues	3.79	.76
Technical Difficulties	3.62	.81
Resource Constraints	3.53	.78
Ethical Concerns	3.41	.84
Internet Dependency	3.06	.88

Teacher training was the most important challenge described by the respondents ($M = 3.79$), followed by technical issues ($M = 3.62$). Based on these results, great importance should be given to capacity building in the successful application of AI.

6.8. Correlation Analysis

Table 11: Correlations

Variables	1	2	3	4
1. AI-Assisted Art Education	1			
2. Student Inclusion	.682**	1		
3. Student Engagement	.741**	.693**	1	
4. Challenges associated with AI integration	-.284**	-.235**	-.311**	1

Correlation is significant at the 0.01 level (2-tailed).

AI-assisted art education correlated highly with student engagement ($r = .741, p < .01$) and student inclusion ($r = .682, p < .01$) with a strong positive relationship in both cases. All positive educational outcomes had significantly negative correlations with the challenges associated with AI integration.

6.9. Regression Analysis

Table 12: Multiple Regression Analysis

Predictor	B	Beta	t	Sig.
AI-Assisted Art Education	.521	.547	10.42	.000
Student Inclusion	.338	.284	5.31	.000
Challenges associated with AI integration	-.148	-.117	-2.65	.009

7. Model Summary

R	R ²	Adjusted R ²	F	Sig.
.792	.627	.621	109.82	.000

The regression model was statistically significant ($F = 109.82, p < .001$) and accounted for 62.7% of the variance in Student Engagement. The leading predictor was AI-Assisted Art Education, followed by Student Inclusion, while Challenges had a negative impact.

Hypothesis	β	t	p	R ²	Decision
H1: AI-Assisted Art Education → Student Inclusion	.682	13.12	< .001	.465	Supported
H2: AI-Assisted Art Education → Student Engagement	.741	15.37	< .001	.549	Supported

8. Summary of Findings

The findings of the study revealed positive perceptions of AI-assisted art education among the respondents. The descriptive statistics showed high levels of all three factors of AI-Assisted Art Education, Student Inclusion, and Student Engagement, indicating that the participants had a positive perception of the use of AI technologies in the field of art education, regarding its potential to enhance learning and participation in art education. The reliability analysis showed that all the measurement scales were internally consistent and reliable in terms of data analysis. The findings also revealed that AI-Assisted Art Education had a significant impact on Student Inclusion and Student Engagement, suggesting its potential to foster more inclusive, participatory, and engaging learning spaces. The results of correlation analysis revealed that there were significant positive relationships between AI-Assisted Art Education and Student Inclusion, as well as between AI-Assisted Art Education and Student Engagement. However, the barriers that were identified were related to the challenges faced in the integration of AI, including teacher training problems, technical problems, and resource constraints. Moreover, these difficulties had negative relationships with educational outcomes. Overall, it can be concluded that AI-Assisted Art Education significantly predicted Student Inclusion and Student Engagement, as supported by regression analysis.

9. Discussion

9.1. AI-Assisted Art Education and Student Inclusion

The results of this research indicated that the use of AI in art education gave a significant boost to student inclusion. The participants mentioned that the use of tools supported by AI was associated with accessibility, participation, and equality in learning in the field of art education. The results indicate that AI tools can help lower participation barriers by offering individualized support in learning, multimodal support and flexible ways of expression. These opportunities are especially important for those with a variety of educational backgrounds, abilities and learning styles. The results are congruent with Inclusive Education Theory which states that learning environment should be tailored to meet the needs of all learners. Previous research also indicates that AI technologies can enhance access to and inclusion in education through adaptive learning routes

and assistive educational tools (Chalkiadakis et al., 2024; Li et al., 2025). Overall, the findings suggested a positive relationship between the use of AI in art education and the experience of inclusion, implying that AI can be a valuable tool in fostering equity and engagement in creative learning spaces.

9.2. AI-Assisted Art Education and Student Engagement

The findings also showed that students' engagement in learning art was strongly improved due to the use of AI in teaching. The positive correlation between AI supported learning and engagement is indicative of a correlation where more students engaged in learning activities when AI tools were used in art education. AI technologies offer real-time feedback, creative exploration, and interactive learning, which stimulate cognitive, behavioral, and emotional involvement. The results are in line with Chiu et al., (2022), which found that use of AI in art learning enhanced students' motivation, self-efficacy, and learning performance. In a similar fashion, Lin and Chen (2024) found that AI-based educational applications enhance student creativity, engagement, and interest by adapting to individual needs, thereby tailoring learning experiences to each student's requirements. The results show that when used appropriately, AI can be a catalyst for active participation in and ongoing interest in art education.

9.3. Challenges of Implementing AI-Based Art Learning Tools

The study noted that while the results were positive, there were several challenges in implementing the AI-based art learning tools. Teacher training, technical problems, and resource constraints were identified as the biggest challenges. The results indicate that it indicates a need for many teachers to have a more nuanced understanding and ability to utilise AI technologies in art education. In addition, access to digital resources and technological infrastructure may be restricted, which could make it difficult to implement this. There are also ethical issues surrounding the originality, copyright, authorship, and excessive reliance on AI-generated content. The results align with the study conducted by Ali et al. (2024) which pinpointed technological, operational, and ethical challenges encountered during the use of AI in education. Likewise, Ke (2023) and Park (2023) highlighted issues of artist authenticity and over-dependence on AI-generated content. Hence, the professional development and ethical guidance are crucial for AI integration in effective ways.

9.4. Comparison with Previous Studies

The results of the present study align with prior studies on the use of AI in education and the teaching of art. Like Garzón et al. (2025), the participants of the study reported that AI technologies positively engaged in learning experiences by fostering engagement and participation. The results are also consistent with Chiu et al. (2022) who found that learning motivation and performance can be enhanced with AI in art education. Moreover, the positive correlation between AI-assisted learning and inclusion is consistent with the findings from Li et al. (2025) and Chalkiadakis et al. (2024), who emphasized the importance of making learning accessible and inclusive with the help of AI. The current study contributes to the existing literature by also considering the opportunities and challenges of AI in art education from the lens of student inclusion and engagement, which is underrepresented in the literature.

9.5. Educational Implications

The findings of this study have important implications for educators, institutions, and policymakers. The findings indicate that AI tools can be used as a complementary teaching aid to foster inclusive and engaging art learning experiences for students. AI technologies should be used to promote creativity, engagement, and individualized learning, all while prioritizing human teaching and artistic expression. It is important for educational institutions to invest in AI infrastructure, digital resources, and their professional development programs to make effective AI implementation possible. Clear policies need to be established regarding ethical considerations, accessibility, and the responsible use of AI in educational contexts. Educational stakeholders can leverage AI-assisted art education to its full extent and provide more inclusive, engaging learning environments for diverse learners by tackling implementation challenges and ensuring equitable access to AI technologies.

10. Conclusion

This research explored the opportunities and challenges that AI can offer to art education with respect to student inclusion and engagement. The results showed that the use of AI in art education positively impacts inclusive learning environments by promoting the accessibility of art, participation, and equitable learning opportunities for all learners. The findings also indicated that the use of AI-based art learning significantly enhanced student engagement by fostering their cognitive, behavioral, and emotional engagement in art learning activities. Correlation and regression results showed that AI-supported art education is a significant predictor of student inclusion and student engagement, which revealed the educational value of AI in the current art classroom.

While the benefits of AI integration are evident, the study also uncovered several challenges, such as teacher training concerns, technical challenges, and resource constraints. These obstacles can hinder the effectiveness of AI-driven learning if not addressed properly. The study concludes that AI has a promising future in nurturing the education of art, with a specific focus on assisting in providing inclusive and engaging learning experiences, yet it is essential that the necessary infrastructure, professional development, and responsible educational practices are in place for effective implementation.

11. Recommendations

11.1. For Educators

Incorporating AI-enabled tools as aids to learning in the field of art education can foster creativity, engagement, and inclusivity. It is important for teachers to have ongoing professional development to appropriately use AI technologies while balancing between technological support and human creativity.

11.2. For Institutions

Schools must invest in digital tools, technological infrastructure, and professional development opportunities to ensure the successful implementation of AI in the field of art education. Equitable access to AI tools for all learners should also be ensured by institutions.

11.3. For Policymakers

Governments need to establish broad principles and ethical standards for the responsible education application of AI. Policies should be oriented towards accessibility, data privacy, digital equity, and building professional capacity in order to foster inclusive learning environments supported by AI.

12. Limitations of the Study

The findings of this study may not be generalizable because it focused on a limited number of respondents from selected universities and colleges. A cross sectional survey design was used to collect participants' perceptions at one specific time and did not allow for consideration of long-term effects. Moreover, there was self-reporting which can have personal biases and individual perceptions of AI technologies.

13. Future Research Directions

Research methods that are suitable for future research include longitudinal research and experimental research to study the long-term effects of using AI in art education on student learning outcomes. AI in art education can also be explored at various schooling stages, in various cultures and art branches. More research is needed to examine other factors like creativity, critical thinking, digital literacy, and artistic performance to gain a deeper understanding of the educational implications of AI technologies. In addition to quantitative research, qualitative and mixed-methods studies are recommended to provide deeper understanding of the students' and educators' experience of the AI supported art learning environments.

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