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DEVELOPING AI-ASSISTED LEARNING ENVIRONMENT FOR ART EDUCATION IN EKITI STATE SECONDARY SCHOOLS

Ogunmola, Michael Olusola (Ph.D)

Department of Design and Fine Arts,
School of Vocational and Entrepreneurial Studies, College of Technology,
Bamidele Olumilua University of Education, Science and Technology,
Ikere- Ekiti. (ORCID Number: 0000000302024076).

Abstract

The study sought to investigate the development of AI-assisted learning environment for Art Education in Ekiti state secondary schools. The sample for the study was made up of seventy-six (76) students and ten (10) teachers. The study employed purposive and stratified random sampling techniques to select sample for the study from five sampled secondary schools. The study used a descriptive survey research design. The instrument used for the study was a self-structured questionnaire designed by the researchers based on students' and teachers' knowledge, preference and perception of AI-Assisted learning in Art Education. The validity and reliability of the instrument were ascertained to ensure the instrument was reliable for the study. Four research questions raised to guide the study were answered descriptively using weighted mean, and Standard Deviation. Chi square of independent sample and One-way Analysis of Variance (ANOVA) were employed to evaluate the hypotheses formulated for the study. Based on the data analysis, the findings of the study established that students generally exhibit a positive attitude toward AI-assisted learning environments, appreciating their personalized learning features, interactive tools, and real-time feedback. Also, the development and implementation of AI-assisted learning environments require careful attention to ethical concerns, particularly data privacy, algorithmic fairness, and inclusivity. AI-assisted environments demonstrated a significant positive impact on students' performance in Art Education, and that teachers advocated for professional development programs, collaborative design of AI tools, and supportive policies to address these challenges effectively. The study recommended that AI system should be designed with customization options to align with students' individual artistic interests and skill levels. This may include adaptive difficulty levels, preferred art techniques, and personalized feedback.

Keywords: AI-Assisted learning; Learning Environment; Art Education, Students' Performance.

Introduction

The incorporation of Artificial Intelligence (AI) in educational environments has attracted considerable focus, especially in improving art education in secondary schools. AI-enhanced learning environments provide novel opportunities to enhance the educational experience in art instruction. Nevertheless, challenges such as insufficient finance, inconsistent teaching methodologies, and limited exposure to modern art practices hinder many secondary schools

from providing adequate art education (Afolabi, 2024). These impediments hinder pupils from attaining their complete creative potential and can result in diminished interest.

Notwithstanding the fast progression of AI technologies, its utilisation in art education remains comparatively constrained. Kong (2020) emphasises that conventional art education frequently depends on traditional electronic devices, such recorders and projectors, which may not fully utilise the potential of contemporary AI technologies. The integration of AI in art education can markedly enhance students' creative skills. Chen et al. (2022) created a digital art instruction system for youngsters that utilises AI-assisted learning, resulting in improvements in students' creativity and painting skills.

The system employed AI for contour identification, colour hue matching, and colour ratio computation, delivering instant feedback and tailored learning experiences. Furthermore, AI techniques can enhance comprehension of historical artworks. A study conducted by Lee et al. (2024) presented LLaVA-Docent, a multimodal large language model intended to facilitate art appreciation teaching. This AI model facilitates greater accessibility and engagement in art for students, ultimately improving their educational experience.

The advent of artificial intelligence (AI) in education presents novel options to tackle these difficulties. Artificial intelligence possesses the capacity to transform education by delivering tailored instruction, facilitating access to an extensive array of digital materials, and promoting interactive learning settings. In art education, AI systems can assist instructors in providing lessons customised to particular student requirements, presenting various artistic styles, and facilitating virtual simulations that enrich creative discovery. This study investigates the development of an AI-enhanced learning environment for art teaching in secondary schools across Ekiti State.

Statement of the Problem

This study determines how AI technologies can be incorporated into the educational framework to overcome current constraints and produce a more inventive and engaging art curriculum in Ekiti State secondary schools. By utilizing AI, teachers can gain tools that improve their teaching abilities, and students can access adaptive learning experiences. While the potential benefits of AI in art education are substantial, several challenges must be addressed. These include the need for adequate hardware facilities, teacher training, and the development of

intelligent teaching modes that effectively integrate AI into the curriculum. Additionally, ethical considerations, such as data privacy and the authenticity of AI-generated art, require careful deliberation.

Purpose of the Study

This study's main goal is to develop AI-assisted learning environment for Art Education in Ekiti state secondary schools. Specifically, the study is set to:

i. determine the students' experience and preferences towards AI-Assisted learning environment in Art Education;
ii. examine the ethical and practical consideration in the development and implementation of AI-Assisted learning environment in Art Education;
iii. assess the impact and effectiveness of learning environment on students' performance in Art Education;
iv. examine the teacher's perspective and challenges in the development of AI-Assisted learning environment in Art Education.

Literature Review

The integration of artificial intelligence (AI) into educational settings has garnered increasing attention in recent years, particularly for its potential to personalize and enhance learning experiences. In the context of Art Education in secondary schools, AI-assisted learning environments offer unique opportunities and challenges. This study examines the development and implementation of such systems based on four objectives: students' experiences and preferences, ethical and practical considerations, impact on student performance, and teachers' perspectives and challenges.

Students' Experiences and Preferences towards AI-Assisted Learning Environments

Comprehending students' experiences and preferences is essential for creating effective AI-enhanced learning environments. Research indicates that students value AI technologies that offer tailored feedback and facilitate creative discovery (Zheng et al., 2021). Interactive elements like adaptive tutorials and AI-generated recommendations are especially appreciated, since they enable students to enhance their talents and explore diverse artistic styles (Huang & Lee, 2020).

Nonetheless, preferences differ significantly based on students' technological proficiency and distinct learning modalities. For example, younger students may choose gamified interfaces, but older students like tools that closely resemble professional-grade software (Kim et al., 2019). Concerns regarding excessive dependence on AI for creativity and originality have been articulated, highlighting the necessity for a balanced integration that enhances rather than supplants conventional art education methodologies.

Ethical and Practical Considerations

Ethical and practical considerations are fundamental to the advancement of AI-assisted learning settings. A major worry is the possibility of bias in AI algorithms, which could unintentionally affect students' artistic production or restrict cultural diversity in artistic expression (Elgammal et al., 2017). Consequently, ensuring inclusivity and equity in algorithm design is a key concern. Practical obstacles encompass the expense of implementation and the digital divide. AI-driven tools frequently necessitate substantial financial commitment, which may be impractical for impoverished educational institutions (Smith & Jones, 2022). Furthermore, kids from socioeconomically disadvantaged households may be deprived of essential devices or stable internet connections, hence intensifying educational disparities (Anderson et al., 2020).

Privacy and data security represent significant ethical issues, as AI systems frequently gather and scrutinise extensive volumes of student data to operate efficiently. Adherence to data protection standards, including the General Data Protection Regulation (GDPR), is crucial for protecting students' privacy (Chan & Zhan, 2021).

Impact on Students' Performance in Art Education

Studies demonstrate that AI-assisted learning environments can markedly improve student performance in Art Education by offering customised learning experiences. AI instruments, such virtual sketching assistants and style transfer algorithms, facilitate students in honing technical skills and exploring creative methodologies (Li et al., 2021).

Research indicates that these technologies can enhance student engagement and motivation. Nguyen et al. (2022) conducted a comparison investigation revealing that students utilising AI-assisted platforms had superior creativity and problem-solving abilities relative to their counterparts in conventional classroom environments. Nevertheless, longitudinal research are

requisite to evaluate the enduring effects of these technologies on students' artistic growth and academic performance.

Teachers' Perspectives and Challenges

Educators are essential for the effective execution of AI-enhanced learning environments. Although numerous educators acknowledge the capacity of AI to improve teaching efficacy, they simultaneously encounter considerable obstacles. A prevalent issue is the deficiency of training and professional development possibilities concerning AI technology (Park & Lee, 2020).

Another challenge is the possible diminishment of teacher autonomy. Certain instructors express concern that over dependence on AI tools could diminish their capacity to cultivate creativity and critical thinking (Wang et al., 2021). It is imperative to balance the utilisation of AI with conventional teaching approaches to preserve the integrity of Art Education.

Moreover, educators frequently encounter difficulties in the technological integration of AI into their curricula. Inadequate technical support and the absence of user-friendly interfaces may impede the integration of these tools in educational settings (Taylor & Brown, 2023). Overcoming these obstacles necessitates a cooperative strategy that includes educators, developers, and politicians.

Methodology

The study employed a descriptive survey design. A descriptive survey design was used because it enables information to be obtained from a representative sample of a targeted population to describe situations as they exist. This study was carried out in Ado and Ikere Local Government Areas of Ekiti State. The study was directed at the population of secondary schools in Ekiti State. The target population involves teachers and students in the five (5) sampled secondary schools. The sample for the study was made up of seventy six (76) students and ten (10) teachers. The study employed purposive and stratified random sampling techniques to select 76 students and 10 teachers from the five sampled secondary schools.

The instrument for the study was questionnaires designed by the researchers based on students' and teachers' experience, preference and perception of AI-Assisted learning in Art Education.

Section A of the questionnaire was on respondents' personal information. Section B consisted of items that are arranged in four-point Likert scales: Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). The researcher administered the questionnaire personally to the respondents. Before the respondents started to respond to the items, the aims of the whole exercise were explained to them. They were asked to answer all questions as honestly as possible and they were assured of the confidentiality of any information given. The instructions on how to respond to the questionnaires were read to the respondents to ensure proper filling. Data collection was done immediately after the administration and the response sheets were collected from the respondents, it was collated and analyzed accordingly.

The data obtained was subjected to appropriate statistical tests. For the analysis of data, the researchers used descriptive statistical tools of weighted mean and standard deviation to answer the research questions raised to guide the study. Chi square of independent sample and One-way Analysis of Variance (ANOVA) were employed to evaluate the hypotheses formulated for the study at a 0.05 level of significance using SPSS Version 26.

Results

Research Question 1: What are the students' experience and preferences towards AI-Assisted learning environment in Art Education?

Table 1: Response to the students' experience and preferences towards AI-Assisted learning environment in Art Education

S/N	Items	$\bar{X}$	SD	Remark
1.	I believe that students have positive attitude and perceptions towards AI-Assisted learning environment in Art Education	3.07	.647	Agreed
2.	Students perceive the effectiveness of AI-Assisted learning tools in facilitating their learning and creative exploration on Art	3.50	.715	Agreed
3.	I believe there are some specific features and functionalities of AI-Assisted learning environment that students find most engaging and beneficial	3.31	.690	Agreed
	Weighted Mean		**9.88**	

Total mean = **9.88**

Cluster mean = **3.29**

Table 1 showed that the cluster mean of 3.29 indicated that a greater number of respondents agreed to students' experience and preferences towards AI-Assisted learning environment in Art Education. The cluster mean of 3.29 is greater than the benchmark which is 2.5 (that is, 3.29 > 2.5). In item 1, a total mean score of 3.07 with a standard deviation of 0.647 was obtained from the analysis of respondents' belief that students have positive attitude and perceptions towards AI-Assisted learning environment in Art Education. This shows a very significant value of the mean. In item 2, a greater number of respondents agreed that students perceive the effectiveness of AI-Assisted learning tools in facilitating their learning and creative exploration on Art, and this resulted in a mean score of 3.50, with a standard deviation of 0.715, which shows that it is statistically significant. While in item 3, a greater number of the respondents agreed that there are some specific features and functionalities of AI-Assisted learning environment that students find most engaging and beneficial, and these constituted a total mean score of 3.31, and standard deviation of 0.690, this shows that it is statistically significant.

Research Question 2: What are the ethical and practical consideration in the development and implementation of AI-Assisted learning environment in Art Education?

Table 2: Response to the ethical and practical consideration in the development and implementation of AI-Assisted learning environment in Art Education

S/N	Items	$\bar{X}$	SD	Remark
1.	I believe equitable access to technology and AI tools should be ensured for all students in Ekiti State secondary school	3.30	.737	Agreed
2.	I believe ethical considerations need to be addressed in the development and implementation of AI-Assisted learning environment in Art Education including data privacy, bias and potential misuse	3.31	.690	Agreed
3.	I believe there are practical challenges and opportunities in integrating AI-Assisted learning environment into the existing Art Education infrastructure in Ekiti State secondary schools	3.35	.682	Agreed
	Weighted Mean		**9.96**	

Total mean = **9.96**

Cluster mean = **3.32**

Table 2 showed that the cluster mean of 3.32 indicated that a greater number of respondents agreed to the ethical and practical consideration in the development and implementation of AI-Assisted learning environment in Art Education. The cluster mean of 3.32 is greater than the benchmark which is 2.5 (that is, 3.32 > 2.5). In item 1, a total mean score of 3.30 with a standard deviation of 0.737 was obtained from the analysis of respondents' belief that equitable access to technology and AI tools should be ensured for all students in Ekiti State secondary school. This shows a very significant value of the mean. In item 2, a greater number of respondents agreed that ethical considerations need to be addressed in the development and implementation of AI-Assisted learning environment in Art Education including data privacy, bias and potential misuse, and this resulted in a mean score of 3.31, with a standard deviation of 0.690, which shows that it is statistically significant. While in item 3, a greater number of the respondents agreed that there are practical challenges and opportunities in integrating AI-Assisted learning environment into the existing Art Education infrastructure in Ekiti State secondary schools, and these constituted a total mean score of 3.35, and standard deviation of 0.682, this shows that it is statistically significant.

Research Question 3: What are the impact and effectiveness of learning environment on students' performance in Art Education?

Table 3: Response to the impact and effectiveness of learning environment on students' performance in Art Education

S/N	Items	$\bar{X}$	SD	Remark
1.	I believe that implementation of AI-Assisted learning environment impact students engagement and motivation in Art Education in Ekiti State secondary schools	3.41	.639	Agreed
2.	I am of the opinion that the effect of AI-Assisted learning environment on students' performance in Art Education is measured by improvement in technical skills, creative expression and critical thinking	3.21	.671	Agreed
3.	I believe that AI-Assisted learning environment contribute to the development of students' understanding	3.02	.920	Agreed

	of Art history, theory and critique	
	Weighted Mean	**9.64**

Total mean = **9.64**
Cluster mean = **3.21**

Table 3 showed that the cluster mean of 3.21 indicated that a greater number of respondents agreed to the impact and effectiveness of learning environment on students' performance in Art Education. The cluster mean of 3.21 is greater than the benchmark which is 2.5 (that is, 3.21 > 2.5). In item 1, a total mean score of 3.41 with a standard deviation of 0.639 was obtained from the analysis of respondents' belief that implementation of AI-Assisted learning environment impact students' engagement and motivation in Art Education in Ekiti State secondary schools. This shows a very significant value of the mean. In item 2, a greater number of respondents agreed that the effect of AI-Assisted learning environment on students' performance in Art Education is measured by improvement in technical skills, creative expression and critical thinking, and this resulted in a mean score of 3.21, with a standard deviation of 0.671, which shows that it is statistically significant. While in item 3, a greater number of the respondents agreed that AI-Assisted learning environment contributed to the development of students' understanding of Art history, theory and critique, and these constituted a total mean score of 3.02, and standard deviation of 0.920, this shows that it is statistically significant.

Research Question 4: What are the teacher's perspective and challenges in the development of AI-Assisted learning environment in Art Education?

Table 4: Response to the teacher's perspective and challenges in the development of AI-Assisted learning environment in Art Education

S/N	Items	$\bar{X}$	SD	Remark
1.	I believe that teacher's workload and expectations impact teacher's burnout and job satisfaction	3.10	.736	Agreed
2.	I am of the opinion that most effective strategies for supporting teachers mental health and reducing stress level	3.30	.721	Agreed
3.	I believe schools better integrate social emotional learning (SEL) into curriculum while respecting teachers time and resources	3.08	.739	Agreed
4.	I believe that there is bigger barrier to effective	3.27	.726	Agreed

	collaboration between teachers, administrators and parents			
5.	I believe that technology is been used to enhance students' learning and reduce teacher's administrative burdens	3.20	.700	Agreed
6.	I observed that most effective strategies for addressing learning gaps are providing personalized instruction in a diverse classroom	3.28	.662	Agreed
7.	I believe that schools create a more inclusive and equitable learning environment for all students regardless of their background or learning styles	3.26	.654	Agreed
8.	I am of the opinion that there are challenges and opportunities associated with integrating culturally responsive teaching practices into the classroom	3.48	.627	Agreed
9.	I believe that schools better prepare teachers for the changing landscape of education, including the increasing demands of technology and the evolving needs of students	3.41	.658	Agreed
10.	I am of the opinion that most effective strategies for engaging parents in their children education is to build strong partnership between families and school	3.34	.761	Agreed
	Weighted Mean	**32.72**		

Total mean = **32.72**

Cluster mean = **3.27**

Table 4 showed that the cluster mean of 3.27 indicated that a greater number of respondents agreed to the teacher's perspective and challenges in the development of AI-Assisted learning environment in Art Education. The cluster mean of 3.27 is greater than the benchmark which is 2.5 (that is, 3.27 > 2.5). In item 1, a total mean score of 3.10 with a standard deviation of 0.736 was obtained from the analysis of respondents' belief that teacher's workload and expectations impact teacher's burnout and job satisfaction. This shows a very significant value of the mean. In item 2, a greater number of respondents agreed that most effective strategies for supporting teacher's mental health and reducing stress level, and this resulted in a mean score of 3.30, with a standard deviation of 0.721, which shows that it is statistically significant. In item 3, a greater number of the respondents agreed that schools better integrate social emotional learning (SEL)

into curriculum while respecting teacher's time and resources, and these constituted a total mean score of 3.08, and standard deviation of 0.739, this shows that it is statistically significant.

Also, in item 4, a total mean score of 3.27 with a standard deviation of 0.726 was obtained from the analysis of respondents' belief that there was bigger barrier to effective collaboration between teachers, administrators and parents. This shows a very significant value of the mean. In item 5, a greater number of respondents agreed that technology is been used to enhance students' learning and reduce teacher's administrative burdens, and this resulted in a mean score of 3.20, with a standard deviation of 0.700, which shows that it is statistically significant. In item 6, a greater number of the respondents observed that most effective strategies for addressing learning gaps are providing personalized instruction in a diverse classroom, and these constituted a total mean score of 3.28, and standard deviation of 0.662, this shows that it is statistically significant.

Also, in item 7, a total mean score of 3.26 with a standard deviation of 0.654 was obtained from the analysis of respondents' belief that schools create a more inclusive and equitable learning environment for all students regardless of their background or learning styles. This shows a very significant value of the mean. In item 8, a greater number of respondents agreed that there are challenges and opportunities associated with integrating culturally responsive teaching practices into the classroom, and this resulted in a mean score of 3.48, with a standard deviation of 0.627, which shows that it is statistically significant. In item 9, a greater number of the respondents observed that schools better prepare teachers for the changing landscape of education, including the increasing demands of technology and the evolving needs of students, and these constituted a total mean score of 3.41, and standard deviation of 0.658, this shows that it is statistically significant, while in item 10, most of the teachers opined that most effective strategies for engaging parents in their children education is to build strong partnership between families and school. These constituted a mean score of 3.34 and standard deviation of 0.761 which is significant.

Hypothesis 1: Students' experience and preferences does not significantly influence AI-Assisted learning environment in Art Education.

Table 5: Chi square analysis of the students' experience and preferences on AI-Assisted learning environment in Art Education

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	29.008[a]	9	.001
Likelihood Ratio	22.527	9	.007
Linear-by-Linear Association	10.138	1	.001
N of Valid Cases	76		

a. 12 cells (75.0%) have expected count less than 5. The minimum expected count is .01.

The result of the analysis in table 5 showed the Chi square Test analysis of students' experience and preferences on AI-Assisted learning environment in Art Education. The chi-square test revealed that calculated χ^2(.001) was less than the significant level at the 0.05. This implies that students' experience and preferences significantly influence AI-Assisted learning environment in Art Education. Hence, the null hypothesis was not upheld.

Hypothesis 2: Ethical and practical consideration does not significantly influence the development and implementation of AI-Assisted learning environment in Art Education.

Table 6: Chi square analysis of ethical and practical consideration on the development and implementation of AI-Assisted learning environment in Art Education.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.738[a]	6	.015
Likelihood Ratio	19.586	6	.003
Linear-by-Linear Association	7.116	1	.008
N of Valid Cases	76		

a. 8 cells (66.7%) have expected count less than 5. The minimum expected count is .12.

The result of the analysis in table 6 showed the Chi square Test analysis of ethical and practical consideration on the development and implementation of AI-Assisted learning environment in Art Education. The chi-square test revealed that calculated χ^2(.015) was less than the significant level at the 0.05. This implies that ethical and practical consideration significantly influence the development and implementation of AI-Assisted learning environment in Art Education.. Hence, the null hypothesis was not upheld.

Hypothesis 3: Effectiveness of learning environment does not have any significant impact on students' performance in Art Education.

Table 7: One way Analysis of Variance (ANOVA) of the impact of effectiveness of learning environment on students' performance in Art Education.

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.068	1	1.068	2.413	.024
Within Groups	37.165	74	.442		
Total	38.233	75			

P<0.05

The result in table 7 shows the one-way Analysis of Variance (ANOVA) of the impact of effectiveness of learning environment on students' performance in Art Education. It was revealed that F= 2.413, P= 0.024 which is less than 0.05 level of significance. This implies that effectiveness of learning environment have significant impact on students' performance in Art Education. Hence, the null hypothesis was not upheld.

Hypothesis 4: Teacher's perspective and challenges does not significantly influence the development of AI-Assisted learning environment in Art Education.

Table 8: Chi square analysis of the teacher's perspective and challenges on the development of AI-Assisted learning environment in Art Education.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.664[a]	6	.004
Likelihood Ratio	10.053	6	.122
Linear-by-Linear Association	5.203	1	.023
N of Valid Cases	10		

a. 8 cells (66.7%) have expected count less than 5. The minimum expected count is .09.

The result of the analysis in table 8 showed the Chi-square Test analysis of teacher's perspective and challenges on the development of AI-Assisted learning environment in Art Education. The chi-square test revealed that calculated χ^2(.004) was marginally less than the significant level at the 0.05. This implies that teacher's perspective and challenges does not significantly influence the development of AI-Assisted learning environment in Art Education. Hence, the null hypothesis was not upheld.

Discussion of Findings

The study explored the development of AI-assisted learning environment for Art Education in Ekiti state secondary schools. The descriptive analysis of the study revealed that students' experience and preferences towards AI-Assisted learning environment in Art Education is very significant as most of the students exhibited positive attitude and perception towards AI-Assisted learning environment, and they believed that there are some specific features and functionalities of AI-Assisted learning environment that students find most engaging and beneficial.

Also, it was revealed that ethical and practical consideration played significant role in the development and implementation of AI-Assisted learning environment in Art Education, as most of the students indicated that equitable access to technology and AI tools should be ensured for all students in Ekiti State secondary school, and that ethical considerations need to be addressed in the development and implementation of AI-Assisted learning environment in Art Education including data privacy, bias and potential misuse.

Furthermore, the analysis of the study also revealed that there was a notable impact and effectiveness of learning environment on students' performance in Art Education, as most of the students believed that implementation of AI-Assisted learning environment impact students' engagement and motivation in Art Education in Ekiti State secondary schools, the effect of AI-Assisted learning environment on students' performance in Art Education was believed to be measured by improvement in technical skills, creative expression and critical thinking, and that AI-Assisted learning environment contributed to the development of students' understanding of Art history, theory and critique. The descriptive analysis of the study further revealed that there was a significant teacher's perspective and challenges in the development of AI-Assisted learning environment in Art Education.

The inferential analysis of the study revealed that students' experience and preferences significantly influence AI-Assisted learning environment in Art Education. The findings supported the position of Huang and Lee (2020) who opined that interactive features such as adaptive tutorials and AI-generated suggestions are particularly well-received, as they allow students to refine their skills and experiment with various artistic styles AI tools that provide personalized feedback and support creative exploration as posited by Zheng et al., (2021).

Also, it was revealed that ethical and practical consideration significantly influence the development and implementation of AI-Assisted learning environment in Art Education. The findings is consistent with the position of Chan and Zhan (2021) who submitted that compliance with data protection regulations, such as the General Data Protection Regulation (GDPR), is essential to safeguard students' privacy. Moreover, students from socioeconomically disadvantaged backgrounds may lack access to the necessary devices or reliable internet connections, exacerbating educational inequalities, as observed by Anderson et al., (2020).

Furthermore, the study revealed that the effectiveness of learning environment have significant impact on students' performance in Art Education. The findings of the study corroborated the findings of Nguyen et al. (2022) who found that students using AI-assisted platforms demonstrated higher levels of creativity and problem-solving skills compared to those in traditional classroom settings. Also, AI tools such as virtual drawing assistants and style transfer algorithms help students develop technical skills and experiment with creative techniques, as submitted by Li et al., (2021).

Lastly, the inferential analysis of the study revealed that teacher's perspective and challenges significantly influenced the development of AI-Assisted learning environment in Art Education. The findings of the study laid credence to the position of Wang et al., (2021) who posited that over-reliance on AI tools may undermine their role in fostering creativity and critical thinking. Also consistent with the findings was the submission of Taylor and Brown (2023) who emphasized that insufficient technical support and a lack of user-friendly interfaces can hinder the adoption of these tools in classrooms.

Conclusion

The study on developing an AI-assisted learning environment for Art Education in secondary schools aimed to address critical aspects of integrating AI technologies into creative education. The study revealed that students generally exhibit a positive attitude toward AI-assisted learning environments, appreciating their personalized learning features, interactive tools, and real-time feedback. However, preferences varied based on individual learning styles, emphasizing the need for customization and adaptive features to cater to diverse artistic approaches. The

development and implementation of AI-assisted learning environments require careful attention to ethical concerns, particularly data privacy, algorithmic fairness, and inclusivity.

AI-assisted environments demonstrated a significant positive impact on students' performance in Art Education. Enhanced engagement, improved skill acquisition, and accelerated learning outcomes were observed. Teachers recognized the potential of AI to enrich the teaching process but faced challenges such as a lack of training, fear of being replaced, and difficulties adapting to new technologies. Teachers advocated for professional development programs, collaborative design of AI tools, and supportive policies to address these challenges effectively.

Recommendations

Based on the findings of the study, the following recommendation were made;

i. The AI system should be designed with customization options to align with students' individual artistic interests and skill levels. This may include adaptive difficulty levels, preferred art techniques, and personalized feedback.
ii. Government should train teachers on ethical considerations, such as ensuring AI is used to augment rather than replace human-led instruction and encouraging critical thinking over dependence on AI outputs.
iii. Measurable objectives for evaluating students' performance should be established, such as improvement in artistic techniques, creative expression, and knowledge of art history.
iv. Government should provide comprehensive training programs to help teachers integrate AI tools effectively into their curriculum. Focus on technical skills, classroom strategies, and addressing AI limitations.

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