Exploring the Role of Generative Artificial Intelligence (AI) in Art Pedagogy

Prof. Memory Queensoap

Department of Foundations, Arts and Social Science Education, Faculty of Education, Federal University Otuoke, Bayelsa State, Nigeria

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ABSTRACT

This empirical study was to explore the role of generative artificial intelligence (GenAI) (text-to-image and multimodal systems) art pedagogy at Federal University Otuoke, Bayelsa State. A mix-method design was adopted to drive home three research questions. Sixty undergraduate students in the Department of Foundations, Arts and Social Science Education were sampled through simple random sampling technique in a 6-week intervention in which students used GenAI tools (Stable Diffusion / Midjourney / DALL·E variants and conversational GenAI for ideation) as part of studio and concept development tasks. Quantitative measures (pre/post surveys on creative self-efficacy, perceived learning, and tool acceptance) were complemented by qualitative data (focus groups, artifact analysis, and instructor interviews). The study observed an increase in mean creative self-efficacy from 3.02 (SD = 0.62) before the intervention to 3.42 (SD = 0.58) afterward, with a paired-samples test reported as statistically significant, $t(53) = 5.12$, $p < .001$, $d = 0.66$. Seventy-eight per cent of students rated GenAI as helpful or very helpful for ideation, while 44% reported moderate-to-high concern about possible erosion of traditional skills. Artifact ratings reportedly indicated greater stylistic variety but lower evidence of manual craft in work involving heavier GenAI assistance. Results showed that GenAI aided ideation and accelerated visual experimentation, increased perceived creative fluency for many students, but also raised concerns about skill erosion, authorship, and ethics. The article discussed pedagogical models for integrating GenAI as a collaborative rather than replacement tool, proposes assessment strategies to preserve core art competencies, and identifies directions for larger, controlled studies.

Keywords: generative AI, art pedagogy, art education, text-to-image, design thinking, educational technology

INTRODUCTION

Generative AI tools (text-to-image and multimodal generators) have moved rapidly from research labs to public use since 2022 and are increasingly visible in creative practice and design education. Educators and students now face both opportunities (rich ideation, rapid iteration) and challenges (ethical questions about training data, attribution, and learning objectives). Generative artificial intelligence (GenAI) systems can produce text, images, and other media from prompts and examples. In visual art education, text-to-image systems may help learners externalize early ideas, explore visual alternatives, and discuss compositional choices. These affordances do not automatically translate into stronger drawing, painting, design, or other manual skills. The educational value of GenAI depends on how tools are embedded in instruction, how students make and justify decisions, and how learning is assessed.

Emerging classroom research has begun to examine GenAI in art education directly. Hutson and Cotroneo (2023) described a case-based approach in which students refined prompts and iterated on DALL·E 2 outputs; participants reported value for sketchbook development and ideation while raising copyright and artist-replacement concerns. In a controlled study with 78 fifth-grade students, Bian et al. (2025) compared instruction using AI-generated images with instruction using conventional images. The AI-assisted group showed higher classroom engagement and self-efficacy, while cognitive-load differences were not significant.

Rutgers School of Communication and Information (2024) documented that GenAI functions as a collaborator or "conceptual mentor" is useful for ideation and rapid prototyping while limited for nuanced execution and contextual judgement. Researchers cautioned that GenAI alters creative workflows and requires pedagogical reframing rather than simple adoption.

Exploratory work in art and design classrooms reports benefits such as expanded stylistic exploration, lowered barriers to visualization, and support for iterative experimentation. At the same time, literature highlights important concerns: integrity/cheating, student dependence on autogenerated imagery, intellectual property questions, and equity of tool access. Several recent pilot and case-study reports call for teacher training, explicit assessment rubrics, and critical reflection components when GenAI is used pedagogically (Ringvold, 2024).

Most prior work is exploratory or descriptive; there is a need for empirical studies that combine learner outcomes (cognitive and affective), artifact quality, and teacher perspectives to inform practical pedagogy. This study aims to produce empirical evidence about how GenAI affects learning processes, creative outcomes, and teacher strategies in art pedagogy. This study therefore addresses that need with a mixed-methods to provide answer for the following:

1. How did student reported creative self-efficacy and perceptions of GenAI-supported ideation differ between the pre-intervention and post-intervention surveys?
2. What benefits, concerns, and challenges did students and instructors report during the intervention?
3. What patterns were observed in the assessed student artifacts, and what pedagogical practices may support ethical and productive use of GenAI in studio courses?

LITERATURE REVIEW

Concept of Artificial Intelligence

Artificial Intelligence (AI) is the process of modeling human thinking and designing a machine so that it can behave like humans or other terms called cognitive tasks, namely how machines can learn automatically from programmed data and information. Artificial intelligence can also be interpreted Artificial intelligence or AI is one part of computer science that makes machines (computers) able to do work as and as well as humans do. The use of Artificial Intelligence consciously or not we have applied it in everyday life. Many applications have implemented artificial intelligence as an advantage of these applications. Artificial intelligence technology referred to here refers to machines that can think, weigh the actions to be taken, and can make decisions as humans do. Artificial intelligence (AI) is currently being developed on a large scale so that this technology will imitate and even take over the work normally done by humans. Based on the definition of AI, it was created to be able to act like humans in the form of programs and robots, of course to facilitate human work. Even various digital platforms have used AI as a part of it. AI is used to make things easier for humans to do. Several technology companies have implemented AI including Amazon, Facebook, Microsoft, and Google.

Artificial intelligence or (AI) is a technology where machines can learn and understand logic like humans. This technology is said to be able to help simplify human life which is very complex (Ringvold, 2024). AI itself works by combining the presence of several data, iterative processing, and intelligent algorithms. This allows the software to learn automatically from patterns or features in the data. AI can also be said to be a very broad field of study. The scope of theories, methods, technologies, and subfields that exist in AI is very wide, including machine learning, neural networks, cognitive computing, computer vision, and scientific language processing.

The role of Artificial Intelligence (AI) technology is increasingly evident in various sectors, including the education sector. The presence of AI technology has transformed the educational curriculum, especially in the fields of technology, science, mathematics, and engineering. But AI will also change the face of the world of education as a whole. One technology that has recently received attention is Artificial Intelligence (AI). This technology has an important role in facilitating various job functions, including in the field of education.

Generative Artificial Intelligence in Art Education

Generative Artificial Intelligence (GAI) refers to a class of AI systems capable of creating new content—such as images, music, videos, text, and designs—by learning patterns from large datasets. In arts education, generative AI is increasingly recognized as a transformative tool that reshapes how art is taught, learned, and created (Bian, et al., 2025). Rather than replacing human creativity, GAI functions as a supportive technology that expands artistic possibilities and redefines pedagogical approaches.

In the visual arts, generative AI tools enable students to experiment with styles, compositions, and techniques that may otherwise be difficult to access due to limitations in materials, time, or technical skill. By generating multiple variations of an idea, AI encourages exploratory learning and iterative design thinking. Students can quickly visualize concepts, compare artistic outcomes, and refine their creative intentions, fostering deeper engagement with the creative process, Financial Times (2023) posited.

Chen and Wang (2018) emphasized that within music, dance, and performance arts education, generative AI supports composition, choreography, and sound design by offering algorithmically generated patterns, harmonies, and movements. These tools help learners understand structure, rhythm, and form while promoting experimentation. In creative writing and literary arts, AI-generated prompts and drafts can stimulate imagination, support storytelling skills, and assist learners in overcoming creative blocks.

From a pedagogical perspective, generative AI promotes learner-centered and inquiry-based education. It allows educators to personalize instruction, adapt learning materials to diverse skill levels, and provide immediate feedback. This supports inclusive education by accommodating different learning styles and abilities, particularly in contexts where access to specialized art instructors or resources is limited. However, Hutson (2023) asserted that the integration of generative AI in arts education also raises important ethical and educational considerations. Issues such as authorship, originality, intellectual property, cultural representation, and over-reliance on technology require careful attention. Educators play a critical role in guiding students to use AI responsibly, critically, and reflectively, emphasizing creativity, ethical awareness, and human agency.

Nevertheless, GenAI differs from conventional digital tools because it can generate new visual proposals from natural-language prompts. In a learning setting, these outputs can function as references, alternatives, or material for critique rather than as finished substitutes for student work. Hutson and Cotroneo (2023) reported that prompt refinement and repeated generation helped students explore ideas and develop a more deliberate process, while also exposing questions about authorship, copyright, and whether generated images should be submitted as final products. As a case-based study, it offers useful pedagogical observations but does not by itself establish that GenAI improves artistic competence.

Bian et al. (2025) provide directly relevant comparative evidence. Their experiment assigned 78 fifth-grade students to a GenAI-assisted image condition or a conventional-image condition. The authors reported greater classroom engagement and self-efficacy in the treatment group and no significant difference in cognitive load. They also evaluated student paintings using criteria that included technical skill, theme alignment, composition and design, creativity and originality, effort, and improvement. The study is relevant because it separates learner perceptions from ratings of artwork, but its primary-school context and use of generated images as instructional materials differ from a university intervention in which students use GenAI for ideation and studio tasks. In a nutshell, generative artificial intelligence represents a significant innovation in arts education, offering new tools for creativity, collaboration, and learning. When thoughtfully integrated, it enhances artistic exploration and pedagogical effectiveness while preparing learners to engage critically with emerging technologies in contemporary creative industries

Empirically, Jiang et al. (2026) synthesized 19 empirical studies and concluded that structured GenAI integration may support learning, creative thinking, engagement, and cultural understanding, while emphasizing that the evidence remains early-stage and context-dependent. Across this developing literature, important issues include the length of interventions, differences in learner age and discipline, access to tools, the role of instructor scaffolding, and the choice of outcome measures. Perceived confidence or engagement should not be interpreted as equivalent to independently demonstrated artistic skill.

The present study contributes a university-based, mixed-methods account from Nigeria, a context not well represented in the emerging art-education literature. Its contribution is descriptive rather than causal. A key gap remains: without a comparison group, baseline equivalence, and a fully documented artifact-rating procedure, it is not possible to determine whether any observed changes were caused by GenAI, normal studio learning, repeated testing, instructor attention, or other influences. This limitation informs the interpretation of all results below.

METHOD

The study used a convergent mixed-methods design, combining pre- and post-intervention survey data with qualitative data from student focus groups and instructor interviews, as well as student artifacts and process logs. The intervention lasted six weeks and took place in the Department of Foundations, Arts and Social Science Education at Federal University Otuoke, Bayelsa State, Nigeria. The design is best characterized as a single-group pretest–posttest pilot with qualitative triangulation, because the source manuscript does not identify a non-intervention or alternative-instruction comparison group. This design can describe within-participant changes and participants' experiences, but it cannot isolate the effect of GenAI from time, ordinary instruction, maturation, testing effects, or other concurrent influences. Future work should use a comparison group receiving equivalent studio instruction without GenAI, ideally with random assignment where feasible.

The study sampled 60 undergraduate students through simple random sampling, using balloting from the Department of Foundations, Arts and Social Science Education. The population consisted of students in History Education and English Education programmes. The study drafted participants within age bracket 16-45 years. The participants include both male and female who are above 200 level, implying that no 100 levels student was included in the study.

Precisely the study adopted a systematic procedure collecting the data. The study used six weeks in the intervention. During, weeks 1–4, participants completed three scaffolded studio assignments that encouraged GenAI use for ideation, compositional exploration, or remixing. Instruction included a 90-minute workshop on prompt design, ethics, copyright, and technical demonstrations; instructors received a short facilitator guide. The researchers adapted standardized tools such as Stable Diffusion, Midjourney, DALL·E variants, and conversational GenAI as tools. In week 5, six focus groups reportedly involving 8–10 participants each were conducted, alongside instructor interviews; student artifacts and process logs were collected. In week 6, participants completed the post-intervention survey using the same scales and additional questions about perceived learning and ethical attitudes. A total of 54 participants attended the session.

Creative self-efficacy was measured using a six-item adapted scale with five-point modified Likert response options – Very Helpful (VH); Helpful (H); Not Sure (NS); Not Helpful (NH) and Not Very Helpful (NVH). The items addressed perceived usefulness and ease of use, while open-ended reflection prompts addressed learning gains, frustration, and authorship. Student artifacts were assessed by two external art instructors using a rubric covering creativity, craft, and conceptual coherence through a blind rating. The researcher ensured that raters were blind to time point and level of GenAI assistance, and disagreements were resolved to form the valid instrument. Also, an inter-rater reliability was computed via Cohen's Kappa (Cohen *et al*, 2000) which gave a reliability coefficient of 0.75 which was high enough to consider the instrument reliable. Data obtained were analyzed using descriptive statistics with a reflective thematic analysis of transcripts following Braun and Clarke approaches. The study also adopted a triangulation with artifacts analysis.

RESULTS

Quantitative Outcomes

Creative self-efficacy increased from a reported pre-intervention mean of 3.02 (SD = 0.62) to a post-intervention mean of 3.42 (SD = 0.58). the analysis showed a paired-samples t test of $t(53) = 5.12$, $p < .001$, with Cohen's $d = 0.66$. These figures indicate an increase in participants' reported confidence over the six-week period. Meanwhile, seventy-eight per cent of students rated GenAI as "helpful" or "very helpful" for

ideation. Forty-four per cent reported moderate-to-high concern that over-reliance on GenAI could weaken traditional technical-skill development.

Furthermore, Artifact rubric scores in a blind rated assessment showed no significant difference in overall creativity scores between artifacts produced with heavy GenAI assistance and those with minimal GenAI assistance, but artifacts produced with GenAI tended to score higher on variety of stylistic exploration and lower on evidence of manual craft techniques.

Qualitative Themes

From student focus groups and instructor interviews, four dominant themes emerged:

1. **GenAI as ideation accelerator:** students described GenAI as a "visual sketchbook" — speeding the development of visual options and enabling risk-taking. Many students used it to explore styles they would not have attempted manually.

2. **Prompt literacy and process insight:** learning to craft prompts became a substantive skill; students noted that better prompts led to richer, more useable outputs. Instructors reported promising shifts in students' verbalization of concept intentions.

3. **Authorship, ethics and attribution concerns:** students and faculty worried about sourcing (images/models used to train GenAI), appropriation of styles, and how to credit the machine and human collaborator. Several students expressed discomfort submitting AI-generated images as solely their own work.

4. **Pedagogical tensions:** instructors reported the need to reframe assessments (process-focused, reflective statements, and studio critiques emphasizing decision-making) rather than relying solely on final artifacts.

DISCUSSION

The increase in creative self-efficacy and the high proportion of students who rated GenAI as helpful indicate that participants generally perceived the intervention positively. The qualitative themes offer plausible explanations: rapid visualization may help students externalize ideas, compare alternatives, and articulate intentions. However, these are self-reported or interpretive outcomes. They should not be presented as direct evidence that drawing, painting, composition, craftsmanship, or overall artistic quality improved. The artifact findings are more cautious. The study reported no significant difference in overall creativity ratings, alongside a descriptive pattern of greater stylistic variety and less evidence of manual craft in work with heavier GenAI assistance. The findings are broadly consistent with Hutson and Cotroneo's (2023) case-based report that iterative prompt work can support idea exploration while prompting ethical questions. They also resemble Bian et al.'s (2025) findings of higher engagement and self-efficacy in a comparison-group study, although that study concerned fifth-grade learners using AI-generated instructional images rather than undergraduates using GenAI in studio production. The present study cannot make a comparable causal claim because it lacks a comparison condition. Jiang et al.'s (2026) review similarly cautions that positive findings in this new literature should be understood as preliminary and context-dependent.

Pedagogical Implications

- Teach prompt design as one element of visual inquiry, requiring students to explain how each prompt and iteration relates to their artistic intention.
- Use process-based assessment that includes sketches, drafts, prompt histories, selection rationales, revisions, and reflective statements.
- Assess manual and material competencies directly through tasks that require students to demonstrate drawing, painting, composition, or other course-specific skills without relying solely on generated outputs.

- Use explicit attribution rules for AI-generated and AI-assisted elements, and discuss copyright, cultural representation, bias, and the limits of generated imagery.
- Provide equitable access to tools and meaningful non-GenAI alternatives so that access limitations do not determine students' opportunities to demonstrate learning.
- Train instructors to evaluate both the process and the final artifact using transparent rubrics aligned with course learning outcomes.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The principal limitation is the single-group pretest–posttest design. Without a comparison group, observed changes may reflect ordinary learning, instructor attention, novelty, repeated testing, or other factors as well as GenAI use. The sample is modest and drawn from one department at one Nigerian university, limiting generalizability. Participant characteristics and prior experience with art and GenAI are not reported.

Future studies should use a comparison group with equivalent instruction and clearly specified differences between conditions; preregister or otherwise document primary outcomes; report participant flow and baseline characteristics; publish survey items and scoring procedures; use blinded raters and validated rubrics; report effect sizes with confidence intervals; and assess skill retention after the intervention. Research in Nigerian universities should also examine infrastructure, access, language and cultural representation, and locally relevant art practices.

CONCLUSION

This six-week study suggested that undergraduate participants perceived GenAI as useful for ideation and reported higher creative self-efficacy after the intervention. Students and instructors also identified concerns about authorship, ethics, and the preservation of manual craft. GenAI is best positioned as a tool for ideation, iteration, and critical discussion alongside explicit instruction and assessment of human artistic decision-making and technical skill.

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