Macrothink Institute™

Journal of Educational Issues
ISSN 2377-2263
2026, Vol. 12, No. 1

Case Study: Integrating AI in Graphic Design Education

Sauman Chu (Corresponding Author)

Department of Design Innovation, University of Minnesota

240 McNeal Hall, 1985 Buford Ave., St Paul MN 55108, USA

Tel: 1-612-624-9705 E-mail: schu@umn.edu

Risheng Liang

Department of Design Innovation, University of Minnesota

240 McNeal Hall, 1985 Buford Ave., St Paul MN 55108, USA

Tel: 1-612-624-9705 E-mail: liang941@umn.edu

Received: October 15, 2025 Accepted: November 19, 2025
Published: January 2, 2026

doi:10.5296/jei.v12i1.23221 URL: https://doi.org/10.5296/jei.v12i1.23221

Abstract

The rapid advancement and integration of AI tools are fundamentally transforming design education. However, the practical reality of this shift is hindered by significant challenges at the educational and operational levels. A case study on logo design was conducted in a university's graphic design class to examine how students integrate AI into their creative process. For this project, students were tasked with redesigning a logo for an existing business, basing their justification for the redesign on the brand's ineffectiveness in both traditional design terms and its failure to align with the company's mission. The required design process asked students to research the brand, generate preliminary concepts using a combination of AI tools and hand-sketches, develop concept variations, and ultimately finalize a new logo. The results from the cohort of 33 students revealed a strong preference for traditional design methods and indicate that, in this educational context, human creativity, critical thinking, and sketching remain the essential origin points for innovative design work, highlighting the current limitations of AI as a primary conceptual generator.

Keywords: Design process, AI tool, Case study, Creativity, Graphic design

1. Introduction

1.1 Introduce the Problem

With the advancement of artificial intelligence (AI) over recent years, DALL·E, Midjourney, Stable Diffusion, and Adobe Firefly have been widely introduced into design classes, driving a significant transformation of design education (Mansour, 2024; Muji et al., 2023; Zhang et al., 2023). However, in actual teaching practice, issues such as insufficient preparedness of colleges and instructors themselves for AI training, students' limited literacy and ethical understanding of AI, the unclear role of AI in creative ideation, and the tension between embedding AI into teaching strategies and creative thinking demonstrate that there are challenges at the educational and practical levels (Melker et al., 2025; Ng et al., 2025; Tien & Chen, 2024).

To explore how design students can integrate AI into the design and creative process, a case study was conducted in a graphic design class focused on logo design. For this experimental short project, students were tasked with redesigning a logo for an existing business whose current branding they reasoned ineffective in representing the company. The criteria for justifying the logo's ineffectiveness were defined broadly, including both traditional design perspectives and alignment with the business' mission. The design process required students to research companies and their current branding, generate preliminary concepts through a combination of AI tools and hand-sketches, develop variations of their chosen concept and finalize the redesigned logo.

The objectives of the project include:

(1) To provide students with a foundational understanding of AI (its nature and function)

(2) To experiment and integrate AI into the design process

(3) To provide a constructive and intentional opportunity for students to understand the limitations and possibilities of AI in design

(4) To critically evaluate AI-generated designs for quality and relevance, and to compare AI outputs with their original hand-sketches

1.2 Importance of the Problem

Since AI is an emerging tool that could significantly influence the teaching and learning environment, this case study provides empirical evidence of the perception, experience, and evaluation of using generative AI tools in the design process. The results could lead to actionable insights for design educators and curriculum designers on how to effectively integrate AI tools into design education. In addition, the outcome would help students to better understand how to navigate the usage of AI in the creative process, the ethical consideration when using AI for idea generation, and the importance of one's own critical judgment in assessing the effectiveness and creativity of a design.

1.3 Relevant Scholarship

In various design fields, including architecture, graphic design, and interior design, studies have provided insights into using AI in the teaching and learning environment. While generative AI tools offer significant potential when integrated into design teaching practice, they also introduce challenges. Zhang et al. (2023) indicated that the lack of parameter control, unrealistic generated results, and insufficient prompt skills emerged as key challenges. For example, in architectural education, students experimented with using Diffusion models combined with hand sketching in early architectural design to quickly generate rendering images and spatial concepts. The study found that most students believed this process could quickly expand concepts and generate diverse ideations in early design. However, many students simultaneously noted that AI generated "fantasy concepts" with unreasonable, unimplementable structures, or that the tool had difficulty accurately understanding professional architectural terms.

In a graphic design course, Muji et al. (2023) interviewed 10 students on six types of AI resources (including DALL-E, ChatGPT, and Khroma, among others). Results indicated that these resources were helpful for learning and inspiration and found that DALL·E could inspire creativity and efficiency. However, the study emphasized the risks of limited critical thinking and AI-generated illusions and misinformation.

On the other hand, in an interior design course, Karadağ and Ozar (2025) conducted a two-phase case study integrating Midjourney as a text-to-image generator. Their study assessed the tool's impact on students' concept development and project outcomes, and sought to understand their perceptions, attitudes, and ethical concerns regarding AI in the design process. The results indicated that students believed AI could help them visualize abstract concepts in the early stages, provide inspiration, and accelerate iterative thinking, while still emphasizing the need to maintain design originality and human judgment.

Wei and Long (2025) proposed a study using artificial intelligence-generated content (AIGC) to assist the logo design process. The study demonstrated that AIGC can efficiently assist designers in extracting keywords, generating examples, and refining logo design instructions. However, AI-generated logos still face limitations in cultural depth, brand consistency, and visual coordination, which require designers' manual adjustment and refinement to achieve professional quality. Similarly, Zhou et al. (2024) systematically analyzed 271 studies on AIGC in product design and proposed an integrated framework summarizing its applications across text, image, audio, video, 3D, and multimodal design processes. Their findings highlighted AIGC's potential to accelerate concept ideation and cross-modal creativity, while also revealing challenges such as technical limitations, ethical dilemmas, and legal problems with generated content.

Although many design teaching practices have shown that AI tools can increase student engagement and creative output (Mansour, 2024; Muji et al., 2023), they have also revealed the inherent challenges and risks. Specifically, teaching practice faces multiple challenges: First, the relationship between students' interaction with AI output and the cultivation of creative ability is not yet clear. Second, there is uncertainty regarding the quality, bias, and

stability of AI-generated content. Third, differences in students' prompting skills lead to significant disparities in their output results, which in turn affect the quality and confidence of creative exploration. Furthermore, most research has tended to focus on tool characteristics, collaborative frameworks, and teaching strategies, lacking a systematic examination of students' perceptions and experiences within a structured design process (Grájeda et al., 2024; Marrone et al., 2025; Tierney et al., 2025). Concurrently, AI-assisted design practice exposes issues such as the ambiguous definition of authorship, uncertainties in output reliability, and the growing risk of creative homogenization. Overall, these challenges highlight the urgent need for educators to explore how to effectively integrate AI tools into design teaching practices.

1.4 Research Questions

The research questions of this study are:

(1) Does using AI tools in the logo redesign process enhance the quantity of students' initial design concepts compared to their usual ideation practices?

(2) Does using AI tools in the logo redesign process enhance the quality of students' initial design concepts compared to their usual ideation practices?

(3) Will using AI tools lead students toward design directions or concepts that they would not have considered on their own during the ideation phase?

(4) How useful and of what quality will AI-generated ideas (prior to human refinement) be perceived by students in supporting their design process?

(5) Will students report a moderate to high level of confidence in their ability to write effective and detailed prompts to guide AI tools in generating the desired types of design ideas?

2. Method

2.1 Participants and Design Process

A total of 33 students participated in this case study project, completing it as a required part of the class curriculum. All students are majoring in a graphic design BFA program. Students were instructed to experiment with and integrate AI tools (with no limitations on the platform) during the initial, rough idea generation stage. They were required to generate at least 10 original ideas using AI tools and 10 original ideas through hand sketches.

Students then participated in a group critique (led by the instructor) to discuss the potential of all sketches before advancing three selected ideas for further refinement. During this critique, students shared the platform(s) they used, and the specific prompts employed for generating concepts. Following the extensive critique, each student had at least three ideas recognized as the most effective directions.

Variations and refinements were then developed for each of the chosen directions. A subsequent critique session was held to select the final direction before students submitted the

project in a PDF format documenting the entire design process. Finally, a presentation was held on the project's due date, which included a further discussion about the use of AI.

2.2 Research Design

To examine the research questions, a mixed-method case study was employed, integrating quantitative surveys with qualitative reflections. This study referenced the Metrics for Measuring Ideation Effectiveness framework proposed by Shah et al. (2003) in creative scale to assess students' creative ideation performance in an AI-assisted logo redesign project. The specific dimensions to be measured include Quantity (the number of ideas generated), Direction (the breadth of the explored design space), and Usefulness or Quality (the perceived usefulness and relevance of AI-generated ideas).

A follow up survey was conducted after the completion and grading of the assignment. The goal of the survey was to understand the impact, influence, and perceived quality of using AI. A final reflection question was also included. The survey questions were-

Question 1: To what extent has using AI for idea generation increased the quantity and variety of initial concepts you produce for this design project?

Response: The question was constructed on a 1-5 scale prompt from significantly decreased to significantly increased. The goal of question 1 was to measure the perceived efficiency, impact, and advantages on AI generated ideas, its quantity and variety.

Question 2: Did the AI-generated ideas lead you toward design directions or concepts you would not have considered on your own?

Response: Multiple choice with yes or no options. The goal of question 2 was to assess the influence of AI generated ideas on creative direction and if it facilities out-of-the-box concepts.

Question 3: How would you rate the usefulness or quality of the ideas directly generated by AI, before any human refinement or selection?

Response: The question was constructed on a 1-5 scale prompt from very Poor to very Good. The goal of question 3 was to assess perceived quality and relevance of AI-Generated Ideas.

Question 4: I feel confident in my ability to write effective, detailed prompts that guide the AI tool to generate the specific types of design ideas I need.

Response: The question was constructed on a 1-5 scale prompt from strongly disagree to strongly agree. The goal of question 4 was to measure the student's sense of mastery and control over the AI tool.

Question 5 (optional): Describe a time (not from this assignment) when an AI-generated idea significantly influenced your final design. How did you iterate on the AI's suggestion to make it your own and suitable for the problem?

Response: An open-ended question and the goal were to assess critical reflection in how they had integrated AI into the design process other than this experimental project. In addition, the

question was designed to understand the level of AI being used by students in their design work.

Question 6: Share other thoughts in relation to AI usage or this project (optional).

Response: An open-ended question and the goal were to capture anything else in relation to AI usage or about this project that students would like to share.

3. Results

The results from the cohort of 33 students revealed a strong preference for traditional design methods. Following are the key findings:

- Refusal to Use AI: Eight students out of 33 outright refused to incorporate AI into their process work.
- Attitude in using AI: The 25 students who started the design process in using AI demonstrated positive optimism and an interest in leveraging AI's potential to enhance design outcomes.
- Perceived Ineffectiveness of AI: Among the 25 students who did use AI for generating initial ideas, most found the resulting design directions to be ineffective and lacking in creativity.
- Limited Inspiration: Limited students reported that the AI-generated sketches provided a measurable level of inspiration.
- Zero AI-Sourced Final Designs: None of the students chose to use an AI-generated sketch as the foundational direction for their final logo redesign. In every instance, the 33 final logo redesigns were conceptually rooted in traditional original hand-sketches.

The follow up survey was completed by 25 students with 8 students not participating. The 8 students did not participate because they did not use AI for the project. The survey qualitative reflections were coded by themes and analyzed by the two researchers of this case study.

In response to question 1 (Figure 1) to the extent that using AI for idea generation increased the quantity and variety of initial concepts on a 1-5 scale from significantly decreased to significantly increased, 4 students responded to 1, 8 students responded to 2, 10 students responded to 3 and 0 students responded to 4 and 5.

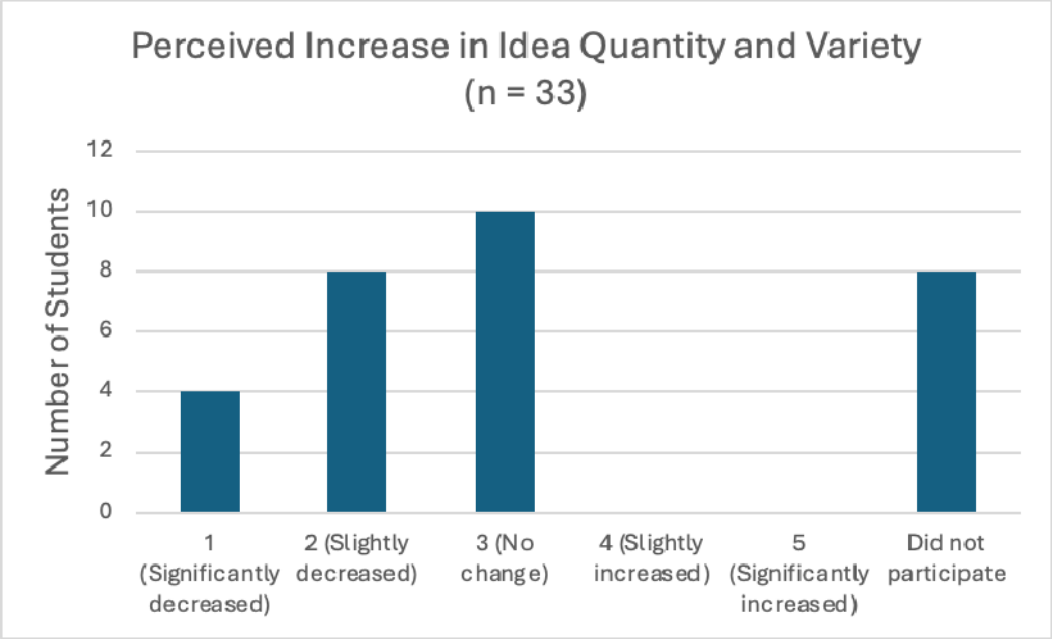

Figure 1. Response rates to survey question1in the extent have using AI for idea generation increased the quantity and variety of initial concepts

In response to question 2 (Figure 2) if AI-generated ideas lead toward design directions or concepts one would not have considered on their own, 20 students responded to no, and 5 students responded to yes.

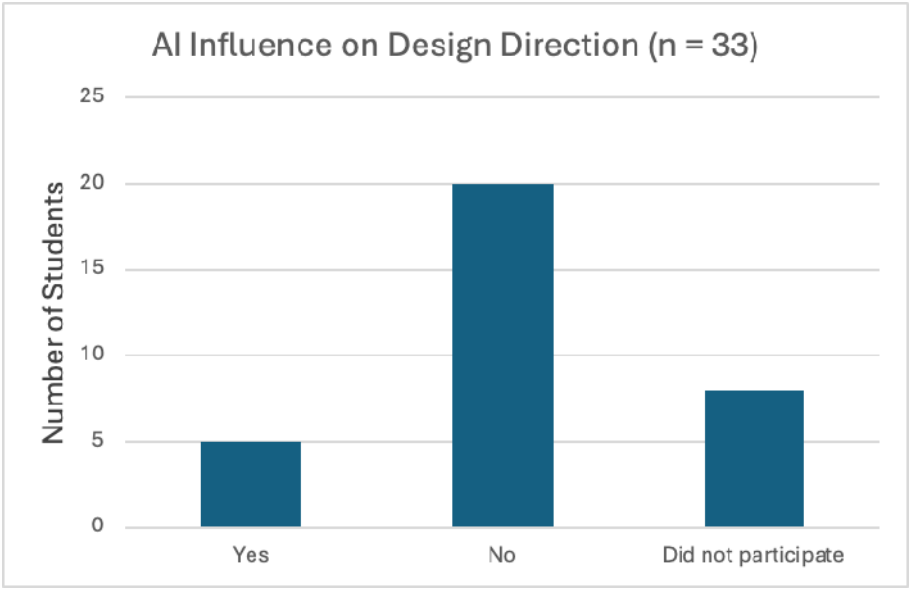

Figure 2. Response rates to question 2 if the AI-generated ideas lead toward design directions or concepts one would not have considered on their own

In response to question 3 (Figure 3) to rate the usefulness or quality of the ideas directly generated by AI, before any human refinement or selection on a 1-5 scale from very poor to very good, 2 students responded to 1, 15 students responded to 2, 8 students responded to 3, no students responded to 4 and 5.

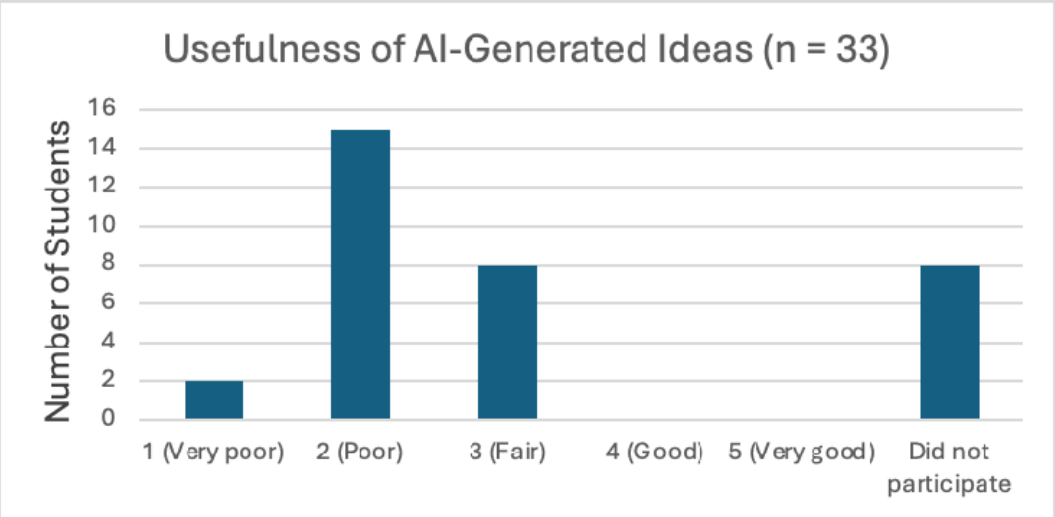

Figure 3. Response rates to question 3 on the usefulness or quality of the ideas directly generated by AI

In response to question 4 (Figure 4) if students feel confident in the ability to write effective, detailed prompts that guide the AI tool to generate the specific types of design ideas on a 1-5 scale from strongly disagree to strongly agree, 3 students responded to 1, 7 students responded to 2, 9 students responded to 3, 6 students responded to 4, and no students responded to 5.

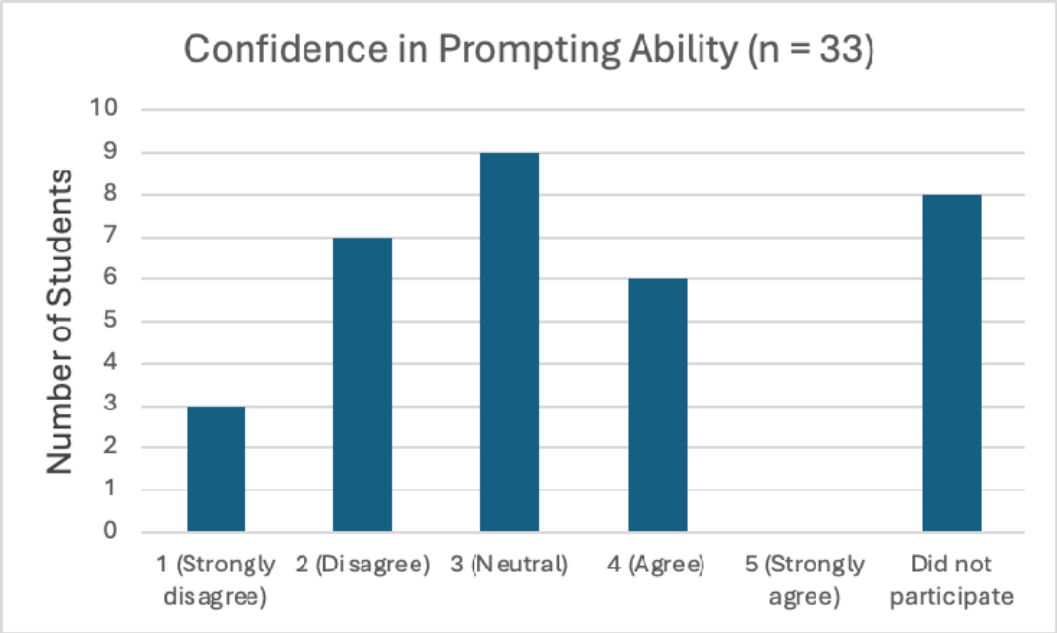

Figure 4. Response rates to question 4 if students feel confident in the ability to write effective and detailed prompts

In response to the optional question 5 in describing a time when an AI-generated idea significantly influenced the final design and how did the student iterate on the AI's suggestion to make it as one's own and suitable for the problem, results indicated that the overwhelming majority of respondents either had never used generative AI for a design project before the project being referenced, or try not to use it for design purposes. Several students stated they have never been influenced by AI in their designs or that AI has never been successful in providing good design inspiration.

In addition, when AI was used, students indicated it has been primarily for limited and practical needs rather than full design generation. Mainly usage included text/concept generation such as brainstorming name ideas for a brand, generating adjectives to convey a feeling, and suggesting color options. Some students used AI for image editing of the background or non-existent parts of an image to allow for better cropping and framing; and one participant indicated that AI provided helpful suggestions for improving text legibility and overall composition of a poster. In addition, some students found that AI was useful for a starting point or as a basis or foundation to work off of and expand upon, rather than a final product.

Regarding the last question of thoughts about using AI for this experimental project, a few students indicated and preferred to use AI as a tool for idea generation and experimentation, not as a complete solution or for final graphic elements. The majority of students valued the traditional methods like hand sketching.

In addition, a student felt that AI wasn't helpful for this specific project but acknowledged it's

a tool one "has to learn to use", and plans to limit its application strictly to idea generation. Five students expressed that AI has potential for initial creative exploration, but for this project, it was ineffective because the AI platforms they have tried seemed very limited in generating ideas regardless how many different prompts they tried.

4. Discussion

Despite providing the option to use AI as a tool for the design process, it was surprising to learn that some students refused to integrate AI. The instructor's numerous attempts to encourage these students to experiment were unsuccessful. A follow-up discussion with this student group revealed two key concerns regarding the use of AI. First, some students felt that AI-assisted design was uninspiring and therefore not worth the time invested, citing past experiences. Second, an ethical concern was identified, with several students viewing the use of AI assistance in their work as unethical.

Although the project allowed students to try any existing AI tools without instructor recommendations or preferences, students largely tended to use tools immediately available to them. The platforms most commonly used by the majority of students were Gemini and ChatGPT. Three students tried Design.com (which advertises itself for logo design) and appeared to find that the AI-generated ideas carried some potential and inspiration, based on comments shared during the critique sessions. Figure 5 shows AI-generated ideas by Design.com. and ChatGPT with different prompts. Figures 6 and 7 show ideas generated by ChatGPT for redesigning Aveeno with different prompts.

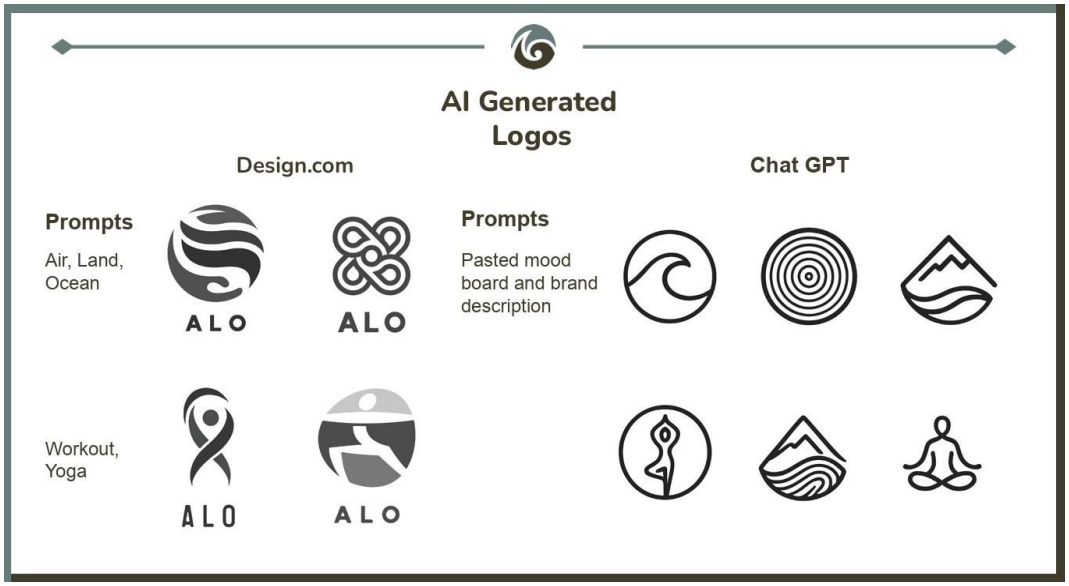

Figure 5. AI generated images provided by Design.com and ChatGPT for redesigning ALO

Figure 6. Six AI generated images provided by ChatGPT for redesigning Aveeno

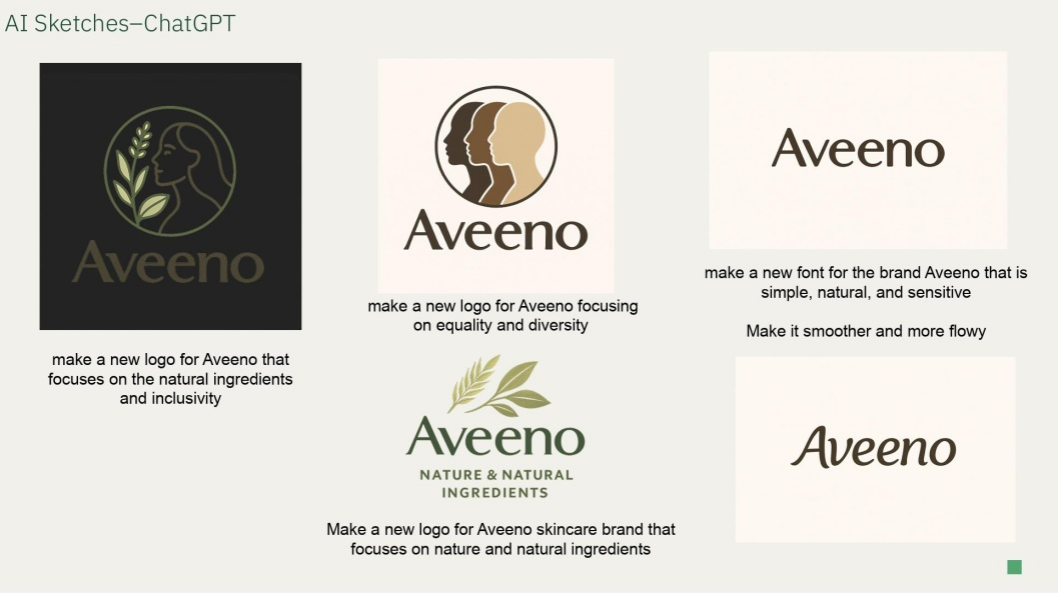

Figure 7. Five AI generated images provided by ChatGPT for redesigning Aveeno

The case study's findings highlight the importance of originality and core creative skills in the field of graphic design. Educators can teach responsible AI use and foster originality in design practice by adopting a pedagogical approach that emphasizes critical engagement rather than passive dependency. This involves introducing and framing AI as a collaborative tool and not a replacement for human creativity. Instructors should design curricula that require students to move beyond simple output generation by applying critical judgment,

making significant modifications, and adding conceptual depth into the AI-generated starting point. Educating students on AI responsibility requires a focus on data ethics and intellectual property. This means ensuring they understand the origins of the training data, the potential biases within AI models, and the critical importance of citing their use of AI and respecting all copyright. Educators should also require hybrid projects where students document their original ideation before and after using AI. This reinforces that human intent and interpretation are the core drivers of ethical design.

It is important to note that this study could not account for pre-existing familiarity or bias toward AI tools, and this is a critical area for future research. While AI offers a tool for rapid ideation, its current capabilities were judged by this group of emerging designers to be ineffective in providing the inspired, creative starting points required for a successful logo redesign. The results strongly indicate that, in this educational context, human creativity, critical thinking, and sketching remain the essential origin points for innovative design work, highlighting the current limitations of AI as a primary conceptual generator.

References

Grajeda, A., Cordova Olivera, P., Córdova Olivera, J. P., Laguna-Tapia, A., Burgos, J., Rodríguez, L., … Sanjines, A. (2024). Embracing artificial intelligence in the arts classroom: understanding student perceptions and emotional reactions to AI tools. *Cogent Education*, *11*(1), 2378271. https://doi.org/10.1080/2331186X.2024.2378271

Karadağ, D., & Ozar, B. (2025). A new frontier in design studio: AI and human collaboration in conceptual design. *Frontiers of Architectural Research*. https://doi.org/10.1016/j.foar.2025.01.010

Mansour, N. (2024). *Redefining Architectural Pedagogy: Navigating the Integration of Midjourney AI in Design Education*. ACSA 112th Annual Meeting: Disrupters on the Edge. https://doi.org/10.35483/ACSA.AM.112.24

Marrone, R., Zamecnik, A., Joksimovic, S., Johnson, J., & De Laat, M. (2025). Understanding Student Perceptions of Artificial Intelligence as a Teammate. *Technology, Knowledge and Learning*, *30*(3), 1847-1869. https://doi.org/10.1007/s10758-024-09780-z

Melker, S., Gabrils, E., Villavicencio, V., Faraon, M., & Rönkkö, K. (2025). Artificial intelligence for design education: a conceptual approach to enhance students' divergent and convergent thinking in ideation processes. *International Journal of Technology and Design Education*, *35*(5), 1871-1899. https://doi.org/10.1007/s10798-025-09964-3

Muji, S., Svensson, E., & Faraon, M. (2024). *Engaging with artificial intelligence in graphic design education* (pp. 31-37). 2023 5th International Workshop on Artificial Intelligence and Education (WAIE). IEEE. https://doi.org/10.1109/WAIE60568.2023.00013

Ng, D. T. K., Chan, E. K. C., & Lo, C. K. (2025). Opportunities, challenges and school strategies for integrating generative AI in education. *Computers and Education: Artificial Intelligence*, 100373. https://doi.org/10.1016/j.caeai.2025.100373

Shah, J., Smith, S., & Vargas Hernandez, N. (2003). Metrics for measuring ideation effectiveness. *Design Studies*, *24*, 111-134. https://doi.org/10.1016/S0142-694X(02)00034-0

Tien, Y.-T., & Chen, R. (2024). *Challenges of Artificial Intelligence in Design Education.* Proceedings of the 2024 15th International Conference on E-Education, E-Business, E-Management and E-Learning, Fukuoka-shi, Japan. https://doi.org/10.1145/3670013.3670044

Tierney, A., Peasey, P. V., & Gould, J. J. M. (2025). Student perceptions on the impact of AI on their teaching and learning experiences in Higher Education. *Research and Practice in Technology Enhanced Learning*, *20*, Article 005. https://doi.org/10.58459/rptel.2025.20005

Wei, Y., & Long, L. (2025). *Research on the Classification of Museum Logo Graphic Language and AIGC Assisted Design Process*. Proceedings of the 2025 2nd International Conference on Digital Systems and Design Innovation, https://doi.org/10.1145/3759275.3759288

Zhang, C., Wang, W., Pangaro, P., Martelaro, N., & Byrne, D. (2023). *Generative Image AI Using Design Sketches as input: Opportunities and Challenges*. Proceedings of the 15th Conference on Creativity and Cognition, Virtual Event, USA. https://doi.org/10.1145/3591196.3596820

Zhou, Z., Han, J., & Li, B. (2025). *Research and Analysis on the Application of Generative Artificial Intelligence Technology in Product Design*. Proceedings of the 2024 International Conference on Artificial Intelligence, Digital Media Technology and Interaction Design, https://doi.org/10.1145/3726010.3726089

Acknowledgments

Not applicable.

Authors Contributions

Dr. Chu designed the study, collected the data, and wrote and revised the manuscript. Mr. Liang was responsible for conducting and drafting the literature review. Both authors read and approved the final manuscript.

Funding

Not applicable.

Competing Interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Informed Consent

Obtained.

Ethics Approval

The Publication Ethics Committee of the Macrothink Institute.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and Peer Review

Not commissioned; externally double-blind peer reviewed.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data Sharing Statement

No additional data are available.

Open Access

Copyrights