

Who Designs with AI? Ethical Boundary-Making and Authorship Negotiation in Generative AI–Assisted Product Design Education

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Research Overview

This study examines how undergraduate product design students negotiate authorship and ethical responsibility when integrating generative artificial intelligence (GenAI) into design practice. Through qualitative thematic analysis supported by descriptive survey triangulation, the research explores how students construct ethical boundaries between AI-generated suggestions and human design ownership.

Purpose of Study

The emergence of generative artificial intelligence (GenAI) has introduced new questions regarding authorship, originality, and responsibility in creative practices. GenAI tools can generate images, forms, and conceptual suggestions that blur the boundary between machine-generated outputs and human creativity. In design education, this development raises an important ethical question: when students collaborate with GenAI during the design process, how should authorship be understood?

Rather than focusing solely on GenAI's technological capabilities, this study examines the ethical dimension of human–GenAI collaboration in product design education. The research investigates how students interpret GenAI-generated outputs within their design workflow and how they determine whether a design outcome should be considered their own work.

The study addresses three research questions:

1. How students differentiate between GenAI-generated suggestions and human design decisions.
2. How students evaluate originality and stylistic similarity when using GenAI-generated images.
3. How interaction with GenAI encourages reflection on ethical responsibility and authorship in design practice.

By analyzing these dynamics, the research contributes to discussions on values and moral education in creative disciplines. It explores how design education can cultivate ethical awareness in GenAI-assisted design processes.

Research Methods

The study was conducted in an undergraduate Product Design I studio course, where GenAI tools were introduced to support concept exploration and visualization during the design process.

Students used GenAI tools to generate design variations, explore material options, and visualize product concepts from textual prompts that describe form, function, and usage scenarios. However, GenAI-generated outputs were not treated as final designs. Students were required to evaluate, modify, and refine them through manual design development and modeling. Data were collected through two in-depth semi-structured interviews with students who actively integrated GenAI into their product design projects. These interviews explored students' decision-making processes, experiences with GenAI-generated outputs, and reflections on authorship and originality.

The interview data were analyzed using inductive thematic analysis. Initial coding identified recurring patterns in students' descriptions of GenAI-assisted design workflows. These codes were grouped into five analytical themes: GenAI-supported ideation expansion, human design authority, prompt articulation, communication friction with GenAI tools, and emerging ethical awareness.

To contextualize the qualitative findings, responses from a post-course questionnaire completed by ten students were analyzed descriptively. Given the limited sample size, the survey results were used only to support qualitative interpretation rather than to produce statistically generalizable conclusions.

Results and Discussion

The analysis reveals that integrating GenAI into product design education prompted students to negotiate the ethical boundaries of authorship actively during the design process.

First, students consistently described GenAI as an ideation expansion tool rather than a design author. GenAI was primarily used to generate multiple conceptual alternatives or explore potential design directions. Students typically allowed the system to generate many variations and then selected ideas that aligned with their own intentions. In this sense, GenAI broadened the design search space while leaving decision authority with the designer.

Second, students emphasized the importance of human judgment in evaluating GenAI outputs. Rather than adopting generated results directly, students described selecting promising ideas, modifying them, or manually reconstructing designs through modeling and refinement. These practices reinforced the designer's role as the final decision-maker in the creative process.

Third, interaction with GenAI tools exposed technical limitations and communication challenges. Students frequently reported that generated images contained unrealistic details or failed to accurately convey design intentions. These breakdowns required students to revise prompts or manually correct outputs, reinforcing the need for human oversight in GenAI-assisted design workflows.

Fourth, the design process prompted ethical reflection on originality and authorship. Some students described verifying GenAI-generated images by searching for similar references online to ensure that their designs did not unintentionally replicate existing products. Others raised concerns about the training data used by GenAI systems and the potential ambiguity of copyright ownership.

Taken together, these observations suggest that GenAI does not eliminate human authorship in design education. Instead, it creates situations in which students must determine how to interpret, modify, or reject GenAI-generated suggestions within their own design process.

Overall, the findings indicate that integrating GenAI into product design studios can function as an opportunity for ethical learning, encouraging students to reflect on originality, responsibility, and authorship in technologically mediated creative practice.

Keywords

Generative AI; Design Ethics; Authorship; Product Design Education; Human–AI Collaboration