



AI-Augmented Branding: Exploring the Impact of Generative Design Tools on Visual Identity Development in the Creative Industry

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Abstract. *This study explores how generative artificial intelligence (AI) is reshaping the way visual designers and educators work and think. With tools like Midjourney, Adobe Firefly, and DALL·E becoming more widely used, creative processes are evolving, raising new questions about who creates, what counts as original, and how creative labor is valued. Through a qualitative approach, this research draws on interviews and document analysis involving professional designers and design educators in Indonesia. The findings reveal a complex landscape: generative AI opens up new space for experimentation, speeds up workflows, and helps spark ideas. At the same time, it brings challenges such as ethical concerns, growing reliance on automation, and the risk of losing touch with foundational design skills. In the classroom, AI is both a disruption and an opportunity, pushing educators to rethink traditional studio methods while also offering fresh ways to build curricula. The study emphasizes the importance of fostering critical awareness in using AI, developing ethical guidelines for creative work, and adapting educational strategies to keep pace with technological change. By shedding light on how generative AI is influencing visual design, this research contributes to broader conversations about creativity, authorship, and innovation in today's digital era.*

Keywords: *Generative AI, Visual Design, Design Education, Creative Practice, Pedagogy*

INTRODUCTION

The creative world is going through a significant shift. With the rise of generative artificial intelligence (AI), long-held ideas about creativity, authorship, and how design is done are being redefined. In fields like branding and visual identity, tools such as Midjourney, DALL·E, and Adobe Firefly are no longer futuristic novelties—they are now part of everyday creative workflows. These AI systems, which generate images based on text prompts and complex algorithms, are changing how ideas are visualized and how fast creative work can be produced (Balasubramanian, 2024; Jin et al., 2025; Tang, Zhang, et al., 2024). From advertising and fashion to publishing and especially branding, designers are beginning to feel both the potential and the pressure brought by this new technology (Y. Huang et al., 2023; Wohl, 2022).

Branding, by its nature, is more than just making something look good. It is about shaping meaning, aligning visual choices with cultural values, business identities, and audience expectations (Erjansola et al., 2021; Karsono et al., 2021; Ng, 2021). Designers play a key role in translating abstract ideas into forms that people can connect with. In this space, the introduction of generative AI does not simply automate tasks—it challenges the creative decision-making process itself. What was once a profoundly human, intuitive practice is now influenced by

algorithms trained on vast image datasets (Anantrasirichai & Bull, 2022; J. Huang & Hedman, 2024).

However, despite its growing presence, the impact of AI on branding practice is still underexplored—especially in Southeast Asia. Much of the existing research focuses on Western contexts or general artistic applications, often emphasizing technical performance over real-world experience (Kazemitabaar et al., 2024; Lee, 2022; Li, 2024). This creates a gap in understanding: how do designers in culturally rich, complex, and rapidly changing regions like Indonesia, Malaysia, or the Philippines adapt to tools that were not designed with their contexts in mind? (Go & Mothelsang, 2024; Mohamad et al., 2022; Silva et al., 2024). Many of these tools carry embedded assumptions about aesthetics, workflows, and design standards that may not align with local practices in these countries.

In these settings, AI-generated images can sometimes feel out of place. They may not reflect local aesthetics, cultural symbols, or the nuanced ways people communicate through visual language. The algorithms, after all, are built on data and assumptions shaped largely by Western developers (J. Huang & Hedman, 2024; Yasniy et al., 2024). For Southeast Asian designers, this can lead to a disconnect between what AI offers and what their audiences expect. As a result, the use of generative AI is often careful, deliberate, and framed by cultural sensitivity (Iswanto, 2022; Priyadi & Slamet, 2024; Wibowo & Zainudin, 2024).

From a theoretical point of view, this phenomenon invites us to think beyond just tools. It brings up questions about where creativity lives—in the human mind, the machine, or somewhere in between. It touches on professional identity, ethics, and how technology is shaped by the cultures that adopt it (Buckeridge et al., 2022; Rachmad et al., 2023). Rather than seeing AI as simply a new gadget, this research looks at it as a force that influences how designers think, feel, and work.

This study, therefore, aims to understand how branding designers in Southeast Asia are responding to the rise of generative AI. What do they make of these tools? How are they using (or avoiding) them in their projects? Moreover, what does that tell us about the broader shifts happening in the creative professions? To explore these questions, the research takes a qualitative approach, combining interviews with professional designers and analysis of design documentation across Indonesia, Malaysia, and the Philippines (Verning et al., 2025).

The findings reveal a nuanced picture. Designers see generative AI as helpful for generating ideas, especially in the early stages of a project. It supports moodboarding, testing out visual directions, and saving time. However, there is hesitation when it comes to relying on AI

for final design outputs—especially when cultural accuracy, originality, and trust with clients are on the line (Jin et al., 2025; Li, 2024). Some see it as a new creative partner; others worry it may replace parts of their role or flatten their cultural voice (Go & Mothelsang, 2024; Lee, 2022).

By focusing on real-world experiences in Southeast Asia, this study adds a much-needed perspective to global conversations about AI in creative work. It suggests that the value of generative AI lies not just in what it can do technically, but in how it is used, questioned, and adapted by people with different cultural backgrounds and professional values (Anantrasirichai & Bull, 2022; Mohamad et al., 2022). These cultural contexts often demand a more flexible and nuanced approach to visual storytelling. Designers must constantly interpret how algorithmic outputs align with local meaning-making processes.

In the end, this research hopes to show that the future of design—and of creativity more broadly—will not be shaped by technology alone. It will depend on how humans choose to work with that technology, how they preserve meaning and authenticity, and how they reshape their practices in thoughtful, ethical ways. By looking closely at these dynamics in the Global South, this study offers a timely reminder: creativity, even in the age of machines, remains deeply human. This ongoing negotiation between tradition and innovation highlights the enduring role of human agency in the design process.

LITERATURE REVIEW

The emergence of generative artificial intelligence (GAI) has brought about a shift not just in how designs are produced, but also in how creativity, authorship, and cultural identity are understood—especially in the field of branding design. In its early stages, much of the conversation around AI revolved around its ability to improve efficiency and streamline workflows (Kazemitabaar et al., 2024). However, recent discussions—particularly within Southeast Asia and in journals such as *IJGD* and *JIMEB*—have moved beyond those practical concerns to grapple with more profound questions. Who truly creates when AI is involved? What happens to cultural nuance and local context when algorithms become part of the design process?

Branding, after all, is not merely about crafting attractive visuals. It is about telling a story, evoking memory, and building emotional connections. In this sense, GAI presents a paradox. On one hand, it allows designers to explore a vast range of ideas quickly, to test styles that might otherwise be inaccessible. On the other hand, it blurs the boundaries of creative ownership and cultural authorship. When an AI model generates a logo trained on datasets from around the world, can it genuinely capture the spirit of a local culture? These questions become even more urgent in postcolonial societies such as Indonesia, Malaysia, and the Philippines—contexts where

visual identity is intimately tied to histories of struggle, reclamation, and cultural resilience (Anantrasirichai & Bull, 2022; Borre et al., 2023).

What is clear from the literature is that designers in Southeast Asia are not simply passive adopters of GAI. Instead, many take a selective and intentional approach—using AI tools to spark ideas or explore aesthetics, but stepping in with human insight to guide the final product. This hybrid approach reflects the growing idea of “human-in-the-loop” design, where intuition, cultural knowledge, and lived experience remain central to the creative process (Jin et al., 2025; Tang, Ciancia, et al., 2024). These practices highlight the ongoing negotiation between technology and tradition in contemporary branding design.

Still, even this blended model has its challenges. As AI becomes more embedded in creative workflows, concerns grow around the dilution of personal style and the erosion of individual authorship. Designers may find it increasingly difficult to claim their work as truly their own, especially when AI-generated elements dominate the output. In this context, creativity begins to resemble a form of curation—an ongoing negotiation between the designer, the machine, and the data that fuels it. This view resonates with posthumanist perspectives that question human-centered notions of originality and instead see creativity as emerging from interactions among both human and non-human agents.

This shift has been evident in branding practices that blend local heritage with AI-driven design. For example, a logo combining traditional Batik patterns with fractal motifs generated by AI not only demonstrates innovation but also raises questions about authenticity and meaning. While the design may look novel, the underlying concern remains: Are we preserving or distorting cultural symbols? Many GAI models are trained on datasets with a strong Western bias, making it difficult for them to capture the subtleties of Southeast Asian visual traditions fully.

Educators have also expressed concern, particularly in design schools. There is growing awareness that while AI tools can accelerate work, they can also contribute to a “flattening” of creative diversity. Students eager to impress may prioritize speed or aesthetic polish over cultural depth, leading to what some scholars call “algorithmic neocolonialism”—a new form of cultural dominance shaped by data and code (Go & Mothelsang, 2024; J. Huang & Hedman, 2024). This phenomenon poses a risk to the preservation of diverse cultural expressions within design education.

In light of these risks, scholars have advocated for the development of localized training datasets—ones that include indigenous motifs, local histories, and region-specific design traditions (Iswanto, 2022). Research published in *IJGD* supports this approach, arguing that AI

tools must be trained on material that reflects the cultural realities of the people using them. Still, this raises further questions: Who decides which cultural content is included? How is it curated? Moreover, how are local communities involved in that process?

There is also a strong pedagogical dimension to this conversation. While digital literacy is now essential, the literature stresses the need for critical literacy as well—the ability to question how AI tools work, what assumptions they carry, and how they influence design outcomes. In this context, educators are encouraged to go beyond teaching software skills and instead help students reflect on how technology shapes their creative identities (Balasubramanian, 2024; Lee, 2022; Tang, Zhang, et al., 2024). Rather than treating GAI as a shortcut, it should be framed as a new design medium—one that requires thoughtfulness, context, and ethical responsibility.

Despite the richness of current debates, there remains a significant gap in understanding how color, when mediated by AI in digital branding, affects user perception in dynamic, screen-based environments. Most studies either address color psychology in isolation or focus on AI-generated content broadly, without examining how these forces intersect in shaping digital brand identity. This study seeks to bridge that gap by exploring how color functions not only as an emotional and symbolic element but as a strategic tool within AI-assisted digital branding ecosystems. This approach aims to contribute new insights to both design theory and practice in the age of AI.

METHODS

A. Research Design

This study employed a quantitative correlational design through an explanatory survey, aiming to examine the relationship between students' digital mindset, resilience, and learning motivation in a post-pandemic learning environment. This design enabled the researchers to analyze both the direction and strength of these relationships based on students' self-reported experiences. The research design facilitates understanding how each variable interacts within the educational context. To provide a theoretical grounding for this methodology, Table 1 summarizes previous key studies related to digital mindset, resilience, and motivation to learn in Southeast Asian educational settings.

Table 1. Summary of Key Literature on GAI and Branding Design in Southeast Asia

Authors & Year	Focus of Study	Key Findings	Contribution to Study
(Anantrasirichai & Bull, 2022)	Review of AI across creative industries	Highlights the impacts of AI on authorship and production	Provides foundational context on the creative-AI intersection
(Balasubramanian, 2024)	Prototype comparison via generative AI tools	Illustrates how designers use AI for rapid ideation	Situates tools in real-world visual design workflows

(Borre et al., 2023)	Cultural & ethical aspects in creative industries	Emphasizes the need for sustainability and cultural integrity in AI use	The importance of context-sensitive AI adoption
(Erjansola et al., 2021)	Brand identity and logo associations	Shows how visual branding shapes cultural identity	Underlines semiotic dimensions in branding processes
(Go & Mothelsang, 2024)	Typography preferences in e-commerce	Reveals shifts in consumer perceptions due to AI-aided design	Connects AI outputs to the user aesthetic experience
(J. Huang & Hedman, 2024)	Integrating AI in visual art workflows	Emphasizes human-centered control in AI creativity	Merges practical workflow insights with theoretical framing
(L. Huang & Jia, 2022)	Big data in cultural and creative industries	Discusses digital and cultural implications of AI-driven design	Supports argument for culturally grounded AI tools
(Iswanto, 2022)	Visual identity rebranding case study	Shows cultural storytelling via AI as an identity asset	Reinforces the link between AI tools and local identity
(Jin et al., 2025)	AI-generated content for design innovation	Introduces models for AI-augmented creativity	Provides methodological support for workflow analysis
(Kazemitabaar et al., 2024)	Cognitive engagement with AI-generated code	Highlights user-device interaction in learning/design	Then helps link critical literacy with tool use
(Koch et al., 2023)	Creative-business orientation in innovation	Analyses the founder mindset in creative sectors	Offers insight into organizational dynamics behind tool adoption
(Lee, 2022)	Everyday creativity and AI's role	Frames broader cultural shifts in creative identity	Grounds academic narrative in cultural critique
(Li, 2024)	Designers' behavioral intention towards AI tools	Investigates risk/anxiety factors in AI adoption	Adds nuance to the discussion of acceptance and resistance
(Mohamad et al., 2022)	Southeast Asian city branding via visual identity	Demonstrates localized approaches to brand identity	Adds regional depth to your Southeast Asia focus
(Prihatmoko & Setiyadi, 2024)	Public awareness of the designer profession via Instagram	Highlights social media's role in professional identity	Links technology, visibility, and professional narrative

B. Research Flow

The research procedure included six structured stages, beginning with the formulation of research problems and literature review, followed by instrument development and validation, a pilot study, and the administration of the central survey. Data analysis and interpretation concluded the process. Each stage was carefully planned to ensure comprehensive coverage of the research objectives. This workflow is depicted in Figure 1.

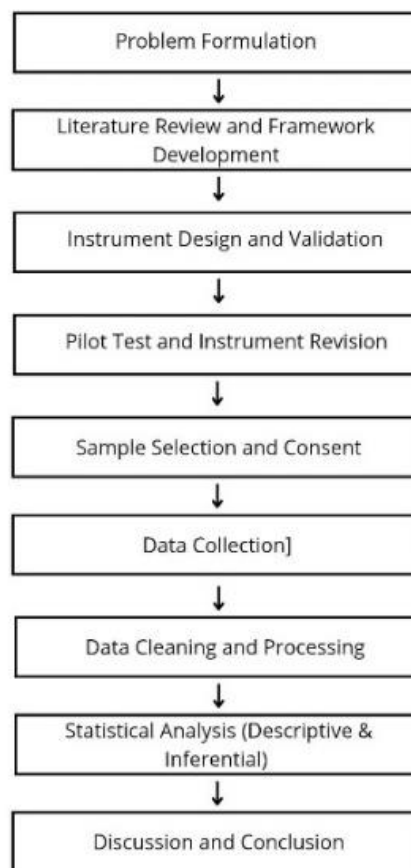


Figure 1. Flowchart of the Research Process

C. Population and Sample

The study involved 110 high school students in West Java, Indonesia, who had experience with online or blended learning during the COVID-19 pandemic. Participants were selected using purposive sampling, targeting students with adequate exposure to digital environments. These criteria helped to maintain a relevant and representative sample for data collection. This sample size is deemed sufficient for multiple regression analysis (Jin et al., 2025; Koch et al., 2023).

D. Data Collection Techniques

Data were collected using a structured questionnaire developed explicitly for this research. The instrument consisted of 27 items across three dimensions: digital mindset, student resilience, and learning motivation. Responses were measured using a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Distribution was conducted both in physical format and online during March 2025.

E. Instrument Validity and Reliability

To ensure validity, the questionnaire was reviewed by three experts in educational psychology and instructional technology. A pilot test with 30 students was used to revise wording for clarity. The pilot test results also identified ambiguous questions that were subsequently refined to enhance participant understanding. Reliability testing yielded high Cronbach's Alpha scores for all dimensions, as shown in Table 2.

Table 2. Reliability Coefficients of Research Instruments

Construct	Number of Items	Cronbach's Alpha
Digital Mindset	9	0.878
Student Resilience	10	0.861
Learning Motivation	8	0.889

The reliability coefficients were calculated using Cronbach's Alpha to assess the internal consistency of the instrument. Each construct demonstrated scores above the commonly accepted threshold, reflecting a high level of reliability. Consistent reliability values suggest that the questionnaire items measure the intended constructs uniformly across different respondents. These values indicate that the instrument is dependable for use in similar contexts.

F. Operationalization of Variables

In order to accurately measure the constructs, it is essential to operationalize each variable through specific, observable indicators. These indicators serve as the basis for data collection and analysis, ensuring the research remains focused and relevant. The theoretical background and prior research were carefully reviewed to select appropriate indicators that reflect the essence of each construct. To provide a clear picture of what each construct represents, the definitions, indicators, and sources of each variable are presented in Table 3.

Table 3. Operationalization of Variables

Variable	Operational Definition	Indicators	Revised Source
Digital Mindset	Students' ability to adapt, explore, and grow in digital settings	Digital self-efficacy, openness, growth	(Jin et al., 2025; Kazemitabaar et al., 2024)
Student Resilience	The capacity to overcome academic difficulties in digital learning	Emotional control, optimism, perseverance	(Koch et al., 2023; Lee, 2022)
Learning Motivation	The drive to persist and succeed in learning tasks	Goal setting, intrinsic drive, effort	(Go & Mothelsang, 2024; Karsono et al., 2021)

This approach helps to clarify the relationship between the theoretical constructs and the practical items used in data collection. Each item was carefully developed to represent specific dimensions of the constructs under study. The clarity of these items was tested during the pilot phase to ensure respondents could understand and respond accurately. The examples presented offer insight into the operationalization process within the questionnaire. A few examples of items from the questionnaire are included in Table 4 to illustrate how these indicators were captured.

Table 4. Indicators and Item Examples

Construct	Indicator	Sample Item
Digital Mindset	Openness to Change	"I enjoy trying new digital tools in learning."
Growth-Oriented Thinking	Growth-Oriented Thinking	"I believe online challenges help me grow academically."
Digital Self-Efficacy	Digital Self-Efficacy	"I feel confident using unfamiliar educational technologies."
Student Resilience	Emotional Regulation	"I remain calm during digital learning obstacles."
Positive Beliefs	Positive Beliefs	"I can adapt to different online learning methods."
Problem-Solving Ability	Problem-Solving Ability	"I actively find ways to solve study-related difficulties."
Learning Motivation	Intrinsic Motivation	"I enjoy learning even when it is challenging."
Goal Orientation	Goal Orientation	"I set learning goals to improve my performance."
Engagement & Persistence	Engagement & Persistence	"I persist in studying even when I fail."

G. Data Analysis Technique

Descriptive statistics were first used to analyze trends in the responses, followed by multiple linear regression to assess the impact of digital mindset on both resilience and learning motivation. The assumptions tested are crucial to ensure the validity of the regression results. These tests verify that the data meet necessary statistical requirements, such as normality via the Kolmogorov–Smirnov test, multicollinearity by checking tolerance and VIF values, and linearity and homoscedasticity assessed through scatterplots and residuals. Only after these checks were the regression analyses conducted with confidence, all analyses were carried out using IBM SPSS Statistics version 26.

H. Research Procedure

The study followed a systematic research procedure, beginning with identifying the research problem and reviewing relevant literature to establish a solid theoretical foundation. This was followed by the development of a conceptual framework to guide the investigation. Instruments were then adapted and validated with expert input to ensure both accuracy and contextual relevance. After conducting a pilot test and refining the instrument, data collection proceeded following the receipt of ethical approval. Subsequent steps included performing statistical analyses and interpreting the findings in detail, with each phase documented carefully to ensure transparency and replicability.

I. Ethical Considerations

The study adhered to strict ethical standards throughout the research process. Participants were fully informed of the study's purpose and provided signed informed consent forms prior to participation. Confidentiality of all personal data was guaranteed, and participants retained the

right to withdraw from the study at any point without penalty. Ethical approval was obtained from school administrators before any data collection activities commenced.

J. Conceptual Framework

This study is based on the premise that students with a strong digital mindset—marked by adaptability, self-confidence, and growth orientation—are more resilient and motivated in digital learning settings. Digital mindset refers to a set of cognitive and emotional skills that help learners effectively engage with technology in various educational settings. This is particularly relevant in post-pandemic contexts, where online and hybrid learning models remain prevalent (Go & Mothelsang, 2024; Kazemitabaar et al., 2024). Moreover, the development of such skills is essential to cope with the evolving demands of digital education platforms.

RESULTS

This section outlines the results obtained from the analysis of data gathered from 110 high school students across different regions in Indonesia. The study set out to understand how a digital mindset contributes to students' resilience and motivation to learn within a post-pandemic educational context. All statistical analyses were performed using SPSS version 26, with the threshold for significance established at $\alpha = 0.05$. The collected data included responses related to digital habits, emotional well-being, and academic performance, providing a comprehensive overview of the students' experiences during the transition back to in-person learning.

A. Descriptive Overview of Key Variables

To begin, Table 5 presents the descriptive statistics for the three core variables in this study: digital mindset, student resilience, and learning motivation. The mean score for digital mindset was 3.85 (SD = 0.42), suggesting that most students had a relatively positive view of using digital tools and demonstrated adaptive thinking in tech-driven environments. Resilience averaged slightly lower at 3.77 (SD = 0.39), while learning motivation emerged as the highest-rated variable, with a mean of 3.92 (SD = 0.45). These initial trends indicate that students generally possess a constructive digital orientation and internal drive, which may serve as psychological resources for post-pandemic educational adjustment.

Table 5. Descriptive Statistics of Main Variables

Variable	N	Mean	Std. Deviation
Digital Mindset	110	3.85	0.42
Student Resilience	110	3.77	0.39
Learning Motivation	110	3.92	0.45

These findings echo the insights of (Go & Mothelsang, 2024) as well as (L. Huang & Jia, 2022), who emphasized that adaptive thinking and digital literacy can significantly enhance

student engagement and autonomy, especially in hybrid or digitally mediated learning settings. The data presented in Table 5 provide a clear overview of the average scores and variability of key constructs measured in the study. These descriptive statistics serve as a foundation for understanding the relationships explored in subsequent analyses. Moreover, the consistency of standard deviations across variables suggests a relatively uniform distribution of responses among participants.

B. Assumptions Testing: Normality and Linearity

Prior to inferential analyses, assumption testing was conducted to validate the appropriateness of linear regression models. Results from the Kolmogorov-Smirnov test indicated that all variables were normally distributed ($p > .05$). Additionally, scatterplots demonstrated a clear linear pattern between digital mindset and the outcome variables. Residual plots confirmed homoscedasticity. These diagnostic tests support the use of parametric statistical techniques. (J. Huang & Hedman, 2024).

C. Predicting Resilience from Digital Mindset

A simple linear regression was used to test whether digital mindset could predict student resilience. The model produced significant results, $F(1, 108) = 26.50, p < .001$, with an R^2 value of .197. This suggests that roughly 19.7% of the variance in resilience can be accounted for by differences in students' digital mindset. The detailed results of the regression analysis are presented in Table 6, showing coefficients, standard errors, and significance levels.

Table 6. Regression Analysis of Digital Mindset on Student Resilience

Model	B	SE	β	t	p
Constant	2.49	0.24	—	10.38	.000
Digital Mindset	0.33	0.06	.444	5.15	.000

This supports the argument that a strong digital mindset—including confidence and openness to new tools—contributes meaningfully to emotional resilience and coping capacity, especially in the wake of disrupted learning environments (Anantrasirichai & Bull, 2022; Buckeridge et al., 2022). The regression results outlined in Table 6 provide empirical evidence supporting the relationship between digital mindset and student resilience. Specifically, the positive coefficient for digital mindset indicates that higher levels of this construct are associated with increased resilience. The statistical significance of these findings reinforces the robustness of this predictive model. Digital mindset encompasses factors such as confidence in using technology and openness to new digital tools, which are critical in adapting to changing educational environments.

D. Predicting Learning Motivation from Digital Mindset

A second regression analysis revealed that digital mindset also significantly predicted learning motivation, $F(1, 108) = 36.25$, $p < .001$, with an R^2 of .251. This indicates that about 25.1% of the variance in learning motivation can be attributed to students' digital mindset. The results displayed in Table 7 summarize the regression coefficients, standard errors, beta values, t-statistics, and p-values for the model. These details provide a comprehensive view of how digital mindset influences learning motivation among students.

Table 7. Regression Analysis of Digital Mindset on Learning Motivation

Model	B	SE	β	t	p
Constant	2.31	0.26	—	8.89	.000
Digital Mindset	0.42	0.07	.501	6.02	.000

This finding resonates with the observations of (Jin et al., 2025), who found that digital content fluency and AI familiarity can enhance students' persistence, goal orientation, and intrinsic drive in academic settings. The regression results presented in Table 7 provide detailed statistics including regression coefficients, standard errors, beta values, t-values, and significance levels. These figures demonstrate the strength and significance of digital mindset as a predictor of learning motivation. The positive beta coefficient suggests that students with a stronger digital mindset tend to exhibit higher levels of motivation. This finding aligns with recent literature emphasizing the role of digital skills in fostering academic persistence and goal-directed behavior.

E. Exploring Subscales for Deeper Insight

To better interpret these associations, the sub-dimensions of each construct were further examined. Among the digital mindset components, digital self-efficacy recorded the highest average ($M = 4.03$), suggesting students felt confident using digital tools in academic contexts. For resilience, emotional regulation ($M = 3.85$) and persistence ($M = 3.81$) stood out, whereas external control scored lower ($M = 3.63$), possibly pointing to gaps in external support systems. In terms of motivation, intrinsic factors ($M = 4.02$) slightly outpaced extrinsic factors ($M = 3.78$), indicating that most students were driven by internal goals and values. These patterns align with the trend toward self-directed learning, as noted by (J. Huang & Hedman, 2024), particularly in digital or semi-autonomous learning environments.

F. Differences by Gender and School Type

Independent-sample t-tests were conducted to explore potential differences across gender and school type. The analysis revealed no statistically significant gender differences in digital mindset ($t(108) = 1.22$, $p = .225$), resilience ($t(108) = 1.04$, $p = .301$), or motivation ($t(108) = 0.87$, $p = .385$). This finding suggests equitable development of cognitive and emotional capacities across male and female students. These results align with previous findings suggesting

that gender may not be a determining factor in students' adaptability to digital learning environments.

However, students from private urban schools reported significantly higher digital mindset scores ($M = 4.01$) compared to those in public rural schools ($M = 3.71$; $t(108) = 2.61$, $p < .05$). This underscores the influence of institutional and infrastructural differences on students' digital preparedness, consistent with (Borre et al., 2023), who highlighted the importance of socio-technological equity in sustainable educational transformation. Students in rural settings may face limitations related to connectivity, device availability, and exposure to digital learning strategies.

G. Correlations Between Digital Mindset, Resilience, and Motivation

Finally, a Pearson correlation analysis was performed to examine the interrelationships among the three core variables. As shown in Table 8, digital mindset was significantly correlated with both resilience ($r = .452$, $p < .01$) and motivation ($r = .503$, $p < .01$). A moderate correlation was also found between resilience and motivation ($r = .428$, $p < .01$). Table 8 illustrates these associations, highlighting the strength and direction of the linear relationships among the key constructs measured in the study.

Table 8. Pearson Correlation Matrix

Variable	1	2	3
Digital Mindset	—	.452**	.503**
Student Resilience	.452**	—	.428**
Learning Motivation	.503**	.428**	—

Note: $p < .01$ (2-tailed)

Together, these results provide a robust empirical foundation showing that digital mindset plays a substantial role in shaping students' psychological resilience and academic motivation. Table 8 clearly presents the strength of these associations, with all correlation coefficients reaching statistical significance at the 0.01 level. These statistical patterns underscore the relevance of digital competencies in fostering both emotional adaptability and academic drive. These findings align with (L. Huang & Jia, 2022), who emphasized the importance of cultivating future-oriented thinking to support learner-centered development in the context of Industry 5.0.

H. Educational Relevance and Practical Implications

While the R^2 values suggest a moderate level of prediction, their educational significance should not be underestimated. The fact that a single cognitive trait—digital mindset—can account for over a quarter of students' motivation highlights its pivotal role in post-pandemic learning environments. This suggests that interventions aimed at enhancing students' digital mindset may have a cascading effect on their motivation and resilience, particularly in tech-mediated learning contexts. As (Go & Mothelsang, 2024) argue, fostering confidence in digital tools and adaptive

learning strategies can lead to more sustainable and engaging academic experiences, particularly when integrated into responsive, student-centered pedagogies.

DISCUSSION

This study reveals how the integration of generative AI tools into creative processes is reshaping the way designers approach ideation and production. Participants consistently noted increased efficiency, broader exploration of visual ideas, and enhanced creative stimulation—particularly when working with platforms such as DALL-E, Midjourney, and Firefly (Balasubramanian, 2024; Tang, Zhang, et al., 2024). These findings support earlier research underscoring AI's role in promoting innovation and cognitive engagement in creative disciplines (Jin et al., 2025; Kazemitabaar et al., 2024). AI-generated outputs also encouraged experimentation with alternative styles and compositions that participants might not have otherwise considered.

A central insight is that generative AI substantially supports the ideation phase, allowing designers to break creative blocks and generate diverse visual outcomes rapidly. This affirms (Koch et al., 2023), who emphasize digital tools as cognitive scaffolds in professional creativity. Participants highlighted how AI-enabled quick iterations and visual experimentation enhanced workflow agility and responsiveness—indicating a shift from linear to more adaptive design processes. This process of accelerated idea generation appears to complement rather than replace traditional brainstorming methods.

However, the designer-AI relationship remains complex. Echoing concerns from (Lee, 2022), participants expressed ambivalence: while AI was seen as a productive co-creator, it also raised fears of creative dependence and diluted authorship. These perceptions mirror the dual role of AI—as an enabler and disruptor (Anantrasirichai & Bull, 2022). Some participants questioned whether originality could be sustained in workflows increasingly shaped by algorithmic outputs. This aligns with concerns in HCAI literature, particularly regarding agency, interpretability, and ethical use (L. Huang & Jia, 2022).

From a socio-technical lens, the adoption of AI is not merely a matter of tool use but reflects evolving relations between designers, collaborators, and digital systems. Participants reported increased attention to input control and AI prompt design, suggesting a transition toward more *strategic engagement* with generative systems. This reflects a movement from passive tool adoption to active, reflective co-creation—central to Human-Centered AI principles. The way designers articulate prompts often determines the conceptual direction and fidelity of the AI-generated outputs.

In branding and visual identity design, the study shows how AI enables dynamic, multi-platform expressions, enhancing adaptability and personalization. This reinforces (Purhita & Rudjiono, 2024), who emphasized how digital tools empower visual communication across education and marketing. Additionally, as noted by (Go & Mothelsang, 2024), AI influences typographic and compositional trends, subtly reshaping aesthetic standards in contemporary branding. Such shifts in aesthetic practices are often informed by algorithmic biases and data-driven stylistic preferences embedded in the tools.

These developments also signal a broader transformation in creative labor. Designers are no longer mere visual executors but cultural mediators navigating complex digital ecosystems. In line with (Koch et al., 2023), the role of designers is expanding to include storytelling, experimentation, and value co-creation. Participants noted that design practice now demands not only artistic skills but also technological fluency and ethical judgment.

Yet tensions persist. Respondents voiced concerns over deskilling, loss of aesthetic diversity, and the potential marginalization of human input—resonating with findings from (Tang, Zhang, et al., 2024). These anxieties underline the importance of fostering *digital mindset* and *inclusive AI literacy*, especially to prepare the next generation of designers for evolving expectations and tools. This tension reveals an underlying uncertainty about the long-term impact of AI on the core values and practices of the design profession.

Implications for design education are particularly salient. Embedding AI meaningfully requires curricula that integrate technical proficiency with critical thinking, ethics, and interdisciplinary learning. As J. (J. Huang & Hedman, 2024) argue, Human-Centered AI frameworks in education can cultivate reflective engagement and prepare students to adapt to technological change responsibly. Educational institutions are increasingly exploring how to align design pedagogy with the evolving needs of digitally mediated creative industries.

Moreover, the findings also affirm the rising importance of visual storytelling and public engagement. AI-powered visuals, when used thoughtfully, can enrich public discourse and elevate the visibility of design practices (Prihatmoko & Setiyadi, 2024). Despite rapid technological evolution, participants emphasized the enduring relevance of empathy, narrative coherence, and contextual awareness in delivering impactful design outcomes. Designers noted that emotionally resonant content remains a key factor in ensuring the effectiveness of AI-assisted visual messaging. Nevertheless, several limitations must also be acknowledged to frame the scope of these conclusions.

While this study offers timely insights into the use of generative AI in visual design and education, it is important to recognize several limitations that shape the scope and depth of the findings. These limitations are crucial for framing the interpretation of the study's results. Understanding these boundaries aids in assessing the generalizability of the conclusions. The following sections will detail these limitations comprehensively.

First, the research is exploratory and qualitative, based primarily on in-depth interviews and document analysis. This approach allowed for rich, narrative-driven insights but inherently limits how broadly the findings can be applied. The participant pool was small and largely composed of early adopters who are actively engaging with tools like Midjourney, Firefly, and DALL·E (Balasubramanian, 2024; Jin et al., 2025). As such, it may not reflect the perspectives of designers who are skeptical, under-resourced, or unfamiliar with AI technologies.

Second, relying on self-reported experiences means that participants may have unintentionally overemphasized the benefits or downplayed the challenges. The excitement surrounding AI's possibilities may have colored their responses, leading to an optimistic bias. Issues like tool fatigue, creative dependency, or the diminishing sense of originality might not have been fully captured in such a narrative frame (Lee, 2022; Li, 2024). Such subjective accounts highlight the need for complementary research methods to capture a more balanced perspective.

Third, this study did not include student voices directly. While educator perspectives offer valuable insight, they cannot fully substitute for learners' experiences—particularly regarding how AI affects student engagement, critical thinking, or skill development (Kazemitabaar et al., 2024). In addition, the study did not deeply compare across different institutional settings or regions, which limits how universally applicable the educational implications may be—especially in areas where digital infrastructure and access remain unequal (Go & Mothelsang, 2024). Future studies could enrich understanding by integrating diverse learner perspectives across varied contexts.

Fourth, while ethical concerns were discussed—particularly around authorship and creative agency—the study did not employ a formal ethical framework for evaluating the broader implications of AI in design. Issues such as bias in training data, intellectual property, or the long-term impact of algorithmic aesthetics on cultural diversity warrant deeper ethical scrutiny (Anantrasirichai & Bull, 2022). A structured ethical analysis would facilitate a more rigorous examination of these concerns. This would help guide responsible AI integration in creative domains.

Fifth, the findings reflect a snapshot in time—specifically the period of 2024–2025, during a rapid phase of AI development. The pace of innovation in this space means that some tools or trends mentioned here may quickly evolve or be replaced, and thus future research will need to update or reassess these conclusions in light of emerging technologies (J. Huang & Hedman, 2024; Koch et al., 2023). This temporal limitation points to the importance of longitudinal studies to track evolving dynamics. Continuous monitoring will be essential to capture ongoing changes.

Finally, this study does not use a mixed-methods or experimental design that could offer more measurable outcomes, such as student learning gains or improvements in design quality. Future work could benefit from triangulating qualitative insights with quantitative metrics—such as creativity scores, time saved, or shifts in educational outcomes over time (Borre et al., 2023; Mund et al., 2022). Employing mixed methods would strengthen the empirical foundation of this research area. Quantitative data could complement narrative findings with objective measures.

In acknowledging these limitations, this research does not seek to present a complete picture—but rather to open a conversation. As the intersection of AI and design education continues to evolve, future studies must take broader, more inclusive, and interdisciplinary approaches. Only then can we fully understand both the promise and the perils of designing with—and alongside—machines. Ongoing dialogue and collaborative inquiry will help shape more nuanced and effective frameworks.

CONCLUSION

This study set out to understand how generative AI is reshaping the everyday realities of visual design practice—and what that means for the future of creative education. By focusing on tools like Midjourney, DALL·E, and Adobe Firefly, the findings go beyond technical capabilities, revealing how designers are beginning to see these systems not just as tools, but as creative partners that influence their ideas, decisions, and the final form of their work (Balasubramanian, 2024; J. Huang & Hedman, 2024; Jin et al., 2025). For many, AI has become a co-pilot in the design process—helping to speed up ideation, expand aesthetic exploration, and lower entry barriers for those still building technical skills (Gao & Grauman, 2021; Lee, 2022). These shifts are influencing how both novice and experienced designers conceptualize their roles in collaborative and computationally assisted workflows.

But this transformation does not come without friction. Designers and educators alike are grappling with deeper questions about authorship, originality, and the place of human intuition in a workflow increasingly shaped by algorithms (Anantrasirichai & Bull, 2022; Koch et al., 2023).

The fear is not only about being replaced, but about losing the richness and unpredictability that makes design human. These concerns are especially urgent in education, where foundational skills and critical thinking are essential, yet at risk of being overlooked in favor of algorithmic convenience (Erjansola et al., 2021; Go & Mothelsang, 2024).

One of the most meaningful insights from this study is the need for a thoughtful integration of AI into design curricula. As generative tools become mainstream, educators must rethink how they teach—not by discarding traditional skills, but by enriching them through AI. This means guiding students to not just use AI, but to question it: how it works, what assumptions it makes, and what it might be leaving out (Kazemitabaar et al., 2024; Prihatmoko & Setiyadi, 2024). Teaching students how to prompt, how to critique bias, and how to interpret visual outputs critically is just as important as teaching them to draw or code.

Equally important is cultivating a reflective mindset. As AI generates more polished images in seconds, students must be encouraged to ask: “Where did this idea come from?” “Is this really mine?” “What values does this design reflect?” In a world where image-making becomes easier, the role of meaning-making becomes even more vital (Borre et al., 2023; L. Huang & Jia, 2022). Encouraging such critical awareness may foster deeper engagement with the design process beyond surface-level aesthetics.

For example, a student creating brand content on Instagram using AI-generated visuals might quickly produce compelling imagery—but without intentional guidance, the results may lack contextual relevance or cultural sensitivity. Embedding case-based learning in curricula—such as analyzing how AI affects brand color usage across platforms—can ground theoretical insights into real-world design decisions. These instructional strategies can help bridge the gap between abstract ethical concepts and their practical implications in digital design. Exposure to real-world scenarios may also improve students’ ability to evaluate visual appropriateness in diverse audience contexts.

However, the findings of this study are shaped by limitations in scope and context. Participants were drawn primarily from design programs in Southeast Asia, meaning the results may not fully capture regional or disciplinary variation. In addition, this study used qualitative interviews, so future research should consider quantitative approaches to validate themes across a broader sample. Expanding the demographic scope in future studies may offer more generalizable insights across global creative industries.

This study also opens pathways for cross-cultural comparisons. How do designers in Western versus Asian contexts relate differently to AI in visual communication? How do client

expectations shape AI adoption in commercial versus educational design settings? Exploring these dimensions could enhance the transferability of findings and deepen understanding of cultural nuance in AI integration.

Finally, the study points toward the value of interdisciplinary thinking. Design students who are exposed to data science, digital ethics, media theory, and humanities will be better prepared not only to use AI—but to shape how it evolves and serves society (Anantrasirichai & Bull, 2022; Mund et al., 2022). As AI continues to blur the lines between disciplines, it will be those who can bridge creative and critical literacies who will lead the way. Educational environments that foster interdisciplinary dialogue can enable more nuanced and socially responsible applications of AI in design.

In short, this study suggests that generative AI is neither a threat nor a miracle—it is a mirror. It reflects back to us the values we bring to our creative work. Educators play a crucial role in ensuring those values remain rooted in human creativity, empathy, and ethical responsibility. The future of design is not about choosing between human or machine—but about teaching the next generation how to work wisely with both (Balasubramanian, 2024; Prihatmoko & Setiyadi, 2024).

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