International Journal of Graphic Design (IJGD)
Volume 04 No. 01 April 2026
E-ISSN: 2987-9434; P-ISSN: 2988-0343, Page 52-69
DOI: https://doi.org/10.51903/ijgd.v4i1.3214
Available online at: https://journal.stekom.ac.id/index.php/ijgd

AI-Assisted Mood Board Development: Enhancing Creative Ideation in Graphic Design Education

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Abstract. *This study examines how integrating Artificial Intelligence (AI) into mood board development enhances the ideation process in graphic design education. The research aimed to understand how AI-supported visual exploration influences students' originality, complexity, and goal alignment during creative concept development. A mixed-method approach was employed, combining quantitative rubric-based evaluation of student mood boards with qualitative thematic analysis of interviews and classroom observations to capture both performance outcomes and design thinking processes. The findings show that AI tools expanded visual exploration and improved conceptual clarity, yet their effectiveness depended on how critically students engaged with prompt iteration and keyword synthesis. Students who refined descriptive keywords and combined AI outputs with digital imaging achieved higher originality and coherence. Complexity increased when students generated multiple AI iterations from different visual angles, whereas goal alignment benefited from structured mind mapping informed by tone and manner. Qualitative results revealed six interrelated themes: idea exploration, AI assistance, visual curation, AI limitations, ethics and reflection, and implementation recommendations, highlighting the interplay between human judgment and computational generation. Overall, the study affirms that mood board development remains essential in guiding conceptual direction and visual storytelling in design education. AI serves as a creative collaborator that supports deeper ideation and expands the boundaries of visual experimentation in contemporary design learning.*

Keywords: *Mood Board, Artificial Intelligence, Design Education, Ideation*

INTRODUCTION

The advancement of Artificial Intelligence (AI) has begun to redefine creative processes across multiple disciplines, particularly in how designers develop and visualize ideas (Prasetya et al., 2025; Sivaranjani & S, 2025; Sudha & Nafeeza, 2025; Sugiarto & Sultana, 2025). In graphic design, the mood board remains a fundamental medium for transforming abstract concepts into visual form (Divyadharshini et al., 2025; Rosyida et al., 2025; Yvier & Eizstvkov, 2025). Traditionally, mood boards bridge the gap between ideation and production, helping designers organize inspiration, establish visual direction, and communicate conceptual intent. The rapid emergence of AI-based visual generation tools has changed how students explore, iterate, and articulate design ideas, making it crucial to understand how such technologies can be strategically utilized to enrich creative thinking and improve the quality of ideation outcomes.

The increasing accessibility of AI-driven image generation tools such as DALL·E, Midjourney, and Stable Diffusion has revolutionized how designers search for, generate, and manipulate visual references. These tools enable students to explore complex ideas more rapidly, yet they also present challenges related to ethical use, originality, and conceptual alignment. Many design students rely on AI outputs as finished results rather than as exploratory stimuli. As a

Received: October, 2025; Revised: November, 2025; Accepted: December, 2025; Published: April, 2026
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result, their mood boards often lack analytical depth and coherence with the design brief. The central problem this research addresses is the misalignment between AI-assisted visual exploration and conceptual reasoning in the design ideation process. Without proper guidance, the use of AI may inadvertently diminish the reflective and interpretative dimensions of creativity.

This study addresses this challenge by positioning AI as a collaborative tool in the ideation process. Rather than replacing human creativity, AI serves as an assistive mechanism that expands visual exploration while allowing designers to retain curatorial and evaluative control. The motivation for this research stems from the growing need to understand how AI can be strategically leveraged to enhance originality, visual complexity, and conceptual alignment in the early phases of design development. By treating AI as a cognitive scaffold that supports ideation, the study explores its potential to strengthen conceptual clarity and improve visual synthesis.

The purpose of this research is to examine how AI-assisted mood board development can enhance the ideation process in graphic design education. It aims to provide both empirical and conceptual insights into how AI-based visual tools can enrich creative thinking and improve design outcomes. The contribution of this study lies in three areas: first, it establishes a framework for evaluating AI-assisted mood boards using the criteria of originality, complexity, and goal alignment; second, it illustrates how students utilize AI to expand and refine visual ideas during concept formation; and third, it identifies practical strategies for integrating accessible AI tools into the ideation workflow. Collectively, these contributions advance understanding of how AI can be effectively leveraged to support creative ideation and elevate the quality of visual communication in design education.

LITERATURE REVIEW

The use of mood boards as an ideation tool has long been recognized in design research for externalizing, structuring, and communicating emerging visual ideas. Mood boards help designers move from abstract, verbal, or emotional input toward concrete visual direction by assembling images, textures, colors, materials, and references into one coherent field of meaning (T. D. Cassidy, 2008). (Endrissat et al., 2016) describe mood boards as “external representations” that support design cognition by making intangible concepts shareable and discussable, thus enabling early validation of ideas before high-fidelity execution. (Lucero, 2012) further argues that mood boards function as framing devices that align perceptions among team members or between the designer and the client. At the same time (T. Cassidy, 2011) shows their value in articulating sensorial and affective qualities that are otherwise difficult to express verbally. In this sense, mood boards are not decorative collages but ideational instruments that mediate between what a designer thinks and what eventually gets produced.

At the same time, contemporary design work takes place in increasingly image-saturated and time-constrained contexts. Designers, including students, must search for, select, and synthesize visual references from very large datasets (e.g., the web, social media, and platform-based portfolios). This creates a new problem: abundance does not automatically produce clarity. Without structured curation, mood boards can become mere visual aggregations lacking conceptual focus. Former studies have therefore emphasized the need for methodical mood board construction, starting from key message, tone and manner, and verbal descriptors, so that visuals are always traceable to design intent and brand context (Anggarini & Maheni, 2022). This aligns with current studio teaching practice in which mind mapping and keyword generation precede mood board making, ensuring that the visual outcome supports the brief (Anggarini, 2025).

Against this backdrop, Artificial Intelligence has introduced a new layer to visual ideation. Studies on computational and generative systems (Choi et al., 2024; Oxman, 2004) argue that AI can expand the divergent phase of design thinking by generating numerous, fast alternatives, sometimes unexpected. More focused systems, such as ImageSense (Koch, Taffin, Beaudouin-Lafon, et al., 2020) or SemanticCollage (Koch, Taffin, Lucero, et al., 2020) have shown that AI can retrieve and organize images based on semantic intent, not just keywords, helping designers traverse large image spaces more meaningfully. Although many of these systems are research prototypes, they point to an important shift: AI not only supplies images; it can also *structure* the space of visual possibilities.

However, existing literature also warns that AI does not automatically improve design quality. Several studies on AI-assisted creativity note two recurrent issues: (1) designers sometimes accept first-generation outputs without deeper iteration, which leads to shallow or homogeneous results; and (2) AI can drift away from the original brief, especially when prompt formulation is vague or when models are trained on culturally generic data (Brisco et al., 2023; Schetinger et al., 2023). In educational contexts, this manifests as mood boards that look visually rich but are weakly tied to the project's key message (Anggarini, 2025). This confirms that AI must be embedded in an ideation workflow that still foregrounds human authorship, curation, and alignment.

Recent work on human–AI collaboration in design stresses this point: AI is most productive when treated as an *exploratory assistant* rather than an *automatic creator* (Berni et al., 2024). In such a role, AI helps students broaden their search space, test adjective–object combinations, and generate variations in angle, material, or atmosphere. The human designer then performs convergence by selecting, editing, compositing, or even re-rendering images digitally to achieve

coherence. This two-step AI-to-human curation pattern is consistent with accounts of reflective design practice, where the tool provides stimuli and the designer provides judgment.

Despite these advances, two gaps remain in the literature. First, much of the work on AI-supported visual ideation focuses on system prototypes. It does not address how accessible, general-purpose AI tools (the kind students use) are mobilized in everyday design tasks such as mood board construction. Second, few studies explicitly examine the *link* between AI-generated imagery and the eventual quality of the mood board, as assessed using concrete criteria such as originality, complexity, and goal alignment. Classroom and studio observations, including in this study, suggest that the strongest outcomes do not come from AI alone, nor from manual sourcing alone, but from students who: (a) derive keywords from the brief through iterative mind mapping; (b) use AI to explore those keywords in several iterations and angles; and (c) refine the selected images through digital imaging to achieve a more intentional visual narrative. This hybrid, iterative, and keyword-driven approach is not yet well modelled in current literature.

Accordingly, the present study is positioned at the intersection of three strands of scholarship: (1) mood boards as cognitive and communicative artefacts in the ideation phase; (2) AI as a catalyst for divergent visual exploration; and (3) design education that requires clear, assessable criteria for judging early-stage visual thinking. By bringing these together, the study addresses the need for an evidence-based account of how AI can be leveraged in practice to improve mood boards, a concrete enhancement of the ideation process in graphic design education.

METHODS

This research employed a mixed-methods approach to investigate how Artificial Intelligence (AI) can be integrated into the development of mood boards to enhance creative ideation in graphic design education. The study combined quantitative assessment of students' works with qualitative exploration of their reflective experiences, enabling both measurable and interpretive insights into AI's pedagogical role.

The study adopted an explanatory sequential design (Creswell & Creswell, 2018), beginning with quantitative evaluation followed by qualitative interpretation. Conducted within a project-based learning (PBL) framework, it involved inquiry, iteration, and reflection as core principles of learning (Dorst & Cross, 2001). Students engaged in authentic packaging design projects that required the use of AI to support visual exploration and conceptual development.

The research was implemented in the Graphic Design Program at Politeknik Negeri Jakarta (PNJ) during the 2024/2025 academic year. Twenty-five second-semester students participated

voluntarily, divided into six groups tasked with creating brand identities and packaging concepts for local small and medium-sized enterprises (SMEs). The relatively homogeneous academic background of participants ensured comparable baseline competence.

Three main data sources were used: (1) a structured assessment rubric, (2) semi-structured interviews, and (3) classroom observations. The rubric assessed mood board quality based on originality, complexity, and goal alignment, derived from creative process frameworks (Endrissat et al., 2016; Runco & Jaeger, 2012). Each group's work was rated on a four-point Likert scale. Interviews with eight representatives explored how AI influenced ideation, visual curation, and ethical considerations, while classroom observations recorded collaboration, feedback, and critical decision-making during design sessions

The study followed several key stages. Students were first introduced to the project objectives, ethical guidelines, and the evaluation rubric. During the ideation phase, they generated keywords reflecting the desired emotion, texture, and style, using AI tools such as Midjourney, ChatGPT, and Gemini to expand their visual vocabulary. They then curated AI-generated images and manually sourced references to construct hybrid mood boards. Presentations and critiques provided opportunities for peer feedback and reflection on creative strategies. In the final stage, students participated in interviews and written reflections discussing their learning process, AI's assistance, and ethical insights.

Quantitative data were analyzed descriptively to determine average scores across originality, complexity, and goal alignment, identifying variations in creative performance. Qualitative data from interviews and observations were analyzed thematically following (Braun & Clarke, 2006) model. Coding yielded key themes: idea exploration, AI assistance, visual curation, AI limitations, ethics and reflection, and recommendations for future use. Triangulation between quantitative and qualitative findings ensured robust interpretation, linking measurable outcomes with experiential evidence.

Validity and reliability were maintained through expert validation of instruments and participant confirmation of interview results. Detailed contextual descriptions supported transferability, and ethical research standards were followed. Participation was voluntary, data anonymized, and discussions emphasized AI transparency and attribution.

The study acknowledges several limitations, including its small sample size, differing digital literacy levels, and reliance on freely accessible AI tools that may produce inconsistent visual quality. Nevertheless, these constraints are typical in exploratory educational research and provide practical insights for future pedagogical implementation.

RESULTS

This chapter presents findings from research on integrating Artificial Intelligence (AI) into mood board development in the context of graphic design education. The results are organized into quantitative and qualitative sections, each addressing different aspects of students' performance, experiences, and reflections. The data are interpreted inductively to reveal how AI-assisted tools influenced creativity, critical thinking, and ethical awareness during the design process.

A. Overview of Findings

The integration of AI-assisted tools in mood board development yielded both measurable and experiential impacts. Quantitatively, the students demonstrated strong performance in originality, complexity, and goal alignment. Qualitatively, the results showed nuanced changes in the way students explored ideas, negotiated authorship, and reflected on ethical practices. Together, these findings underscore the pedagogical potential of AI when positioned as an exploratory and reflective partner rather than a mere generative tool.

B. Quantitative Findings

Quantitative analysis was based on the evaluation of six group projects, each representing a distinct brand identity and packaging concept. Using a four-point rubric adapted from Runco and Jaeger (Runco & Jaeger, 2012) and (Endrissat et al., 2016) scores were assigned for originality, complexity, and goal alignment. The overall average score across all projects was 3.61/4, corresponding to the "Very Good" performance category. Two groups (Group C and Group E) achieved the highest composite scores, exceeding 3.8, while the others ranged from 3.4 to 3.6. It is important to note that these quantitative results are descriptive and intended to illustrate patterns and tendencies within the observed sample, rather than to support inferential statistical generalization beyond the study context.

Table 1. Summary of Quantitive Scores for Each Evaluation Criterion

Code	O1	O2	O3	K1	K2	K3	S1	S2	Average	Category
GROUP A	3	4	3	3	4	3	4	4	3,5	Very Good
GROUP B	4	4	4	4	3	3	4	4	3,75	Very Good
GROUP C	4	4	4	4	4	4	4	4	4,0	Excellent
GROUP D	2	2	4	3	2	2	4	2	2,63	Adequate-to Good
GROUP E	3	4	4	4	4	4	4	4	3,88	Excellent
GROUP F	4	4	4	4	3	3	4	4	3,75	Very Good

In terms of *originality*, students who employed AI early in the ideation phase did not always achieve higher ratings. Some early adopters of AI received lower originality scores because they failed to integrate objects and adjectives carefully into cohesive visual narratives. In contrast,

those who combined AI-generated visuals with deliberate keyword refinement and digital imaging achieved stronger originality and conceptual coherence. Groups that relied mainly on manual image sourcing tended to struggle with novelty, yet still improved their results through careful use of digital imaging and filter-based adjustments.

In terms of *complexity*, the results reflected students' capacity to integrate multiple layers of visual relationships, textures, and styles within a coherent conceptual framework. The average complexity score was 3.57, indicating a strong ability to manage and synthesize visual diversity. However, achieving this level of complexity required students to explore different visual angles and perspectives, often through multiple iterations of AI prompts to generate varied yet cohesive design alternatives. The presence of AI-assisted imagery expanded the visual pool, allowing richer exploration of color schemes, composition dynamics, and material references. At the same time, iterative experimentation helped refine visual depth and structural balance.

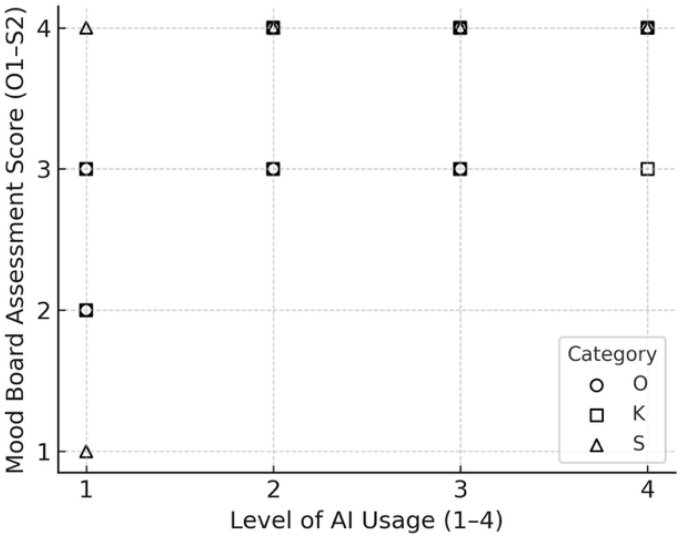

Figure 1. Relationship between Level of AI Usage and Mood Board Assessment Score

The dimension of *goal alignment*, defined as the degree to which the mood board aligned with the design brief, had a mean score of 3.67, the highest among the three criteria. This high score can be attributed to the structured process that guided students in developing specific keywords derived from the project's key message, tone, and manner. Through iterative mind-mapping, students refined their vocabulary until they identified the most appropriate descriptors to define their intended mood and visual direction. AI-supported visual exploration helped clarify brand personality and conceptual focus, as students used generated visuals to test coherence between abstract ideas and practical design objectives. However, the evaluators found that one group's packaging visualization was not rooted in its mood board, revealing a lack of coherence between the two. The issue stemmed from a mood board that contained only object-based

keywords without corresponding adjectives, resulting in a collage-like appearance rather than a conceptually driven composition. This case illustrates how insufficient attention to keyword development can weaken the connection between mood board and design execution, despite the overall strength of AI-assisted processes.

The diagram in Figure 1 illustrates how varying levels of AI usage correspond to mood board performance across three assessment categories. While there is a general upward trend in scores with increased AI use, the relationship is not linear. Some early adopters of AI achieved lower originality due to limited synthesis between object and adjective keywords, whereas students who iteratively refined prompts and combined AI outputs with digital imaging achieved the most balanced results. The figure thus visualizes the nuanced interaction between AI engagement and creative performance. Therefore, beyond the quantitative analysis, a qualitative analysis was also necessary to capture the nuances of students' experiences and interpretations.

C. Qualitative Findings

Thematic analysis of interview transcripts and classroom observations revealed six interrelated themes that illuminate the cognitive, affective, and ethical dimensions of AI-assisted learning: (1) idea exploration, (2) AI assistance, (3) visual curation, (4) AI limitations, (5) ethics and reflection, and (6) recommendations for future implementation.

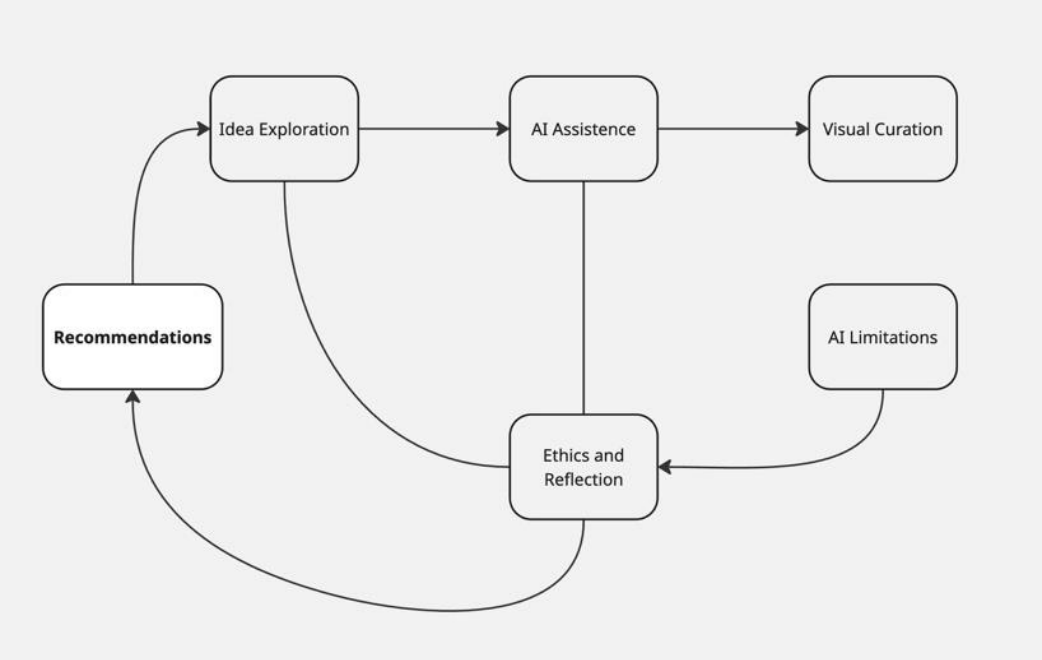

Figure 2. Interconnections Among the Six Themes of AI-Assisted Learning in Mood Board Development

The diagram illustrates the cyclical relationship between idea exploration, AI assistance, visual curation, AI limitations, ethics and reflection, and recommendations for future

implementation. Arrows indicate the iterative flow in which idea exploration triggers AI assistance, leading to visual curation; challenges arising from AI limitations prompt ethical reflection, which informs recommendations that ultimately feed back into new cycles of idea exploration. This figure emphasizes the recursive and reflexive nature of AI-supported creative learning.

1. Idea Exploration

Students consistently described AI as a catalyst for expanding their visual imagination. As one participant remarked, *"AI made me see more possibilities when I changed the keywords; it helped me imagine textures and moods I did not think of before."* The ability to manipulate prompts encouraged divergent exploration and experimentation with form, texture, and mood. Another student explained, *"When I played with different adjectives, the images changed completely, and it gave me ideas for combining organic and modern elements."* Many students reported that AI-generated imagery introduced them to unexpected associations and stylistic hybrids that inspired new conceptual directions.

2. AI Assistance

The role of AI was largely perceived as a collaborator, providing inspiration and structure. Students emphasized that AI simplified the visualization of abstract keywords and facilitated communication within their design teams. One student commented, *"It felt like talking to another designer. When I adjusted the prompt, it responded with new visuals that made my concept clearer."* The iterative prompt-based process mirrored an interactive dialogue, enabling them to articulate their intentions more precisely. However, participants also noted that AI's assistance required interpretive filtering; not every generated image met conceptual or aesthetic expectations. Another participant stated, *"Sometimes the AI gave something that looked good but didn't fit the mood; I had to choose carefully what really represented the concept."* The reflective judgment applied during selection reinforced their agency as creative decision-makers.

3. Visual Curation

A dominant theme across all interviews was the centrality of curation in maintaining creative coherence. Students highlighted the need for human oversight when selecting and arranging AI-generated visuals to ensure alignment with the project's narrative and emotional tone. As one student noted, *"The images from AI are only useful when I combine and organize them with my own sense of balance and storytelling."* The curation process transformed AI from a passive producer into a responsive design partner. As (Munk et al., 2020) suggest, mood boards

act as semiotic systems; here, AI expanded the semiotic repertoire, but human reasoning ensured meaning and intent.

4. AI Limitations

While students acknowledged AI's benefits, they also recognized its shortcomings. Common issues included cultural misrepresentation, inaccurate depictions of material, and stylistic redundancy. Several participants expressed frustration when prompts produced visually appealing but contextually irrelevant images. *"It looked perfect visually, but it didn't represent our cultural theme,"* one student observed. These limitations reinforced the need for critical interpretation and adaptive problem-solving. Students learned to modify prompts strategically or combine AI outputs with manual resources, demonstrating adaptive expertise consistent with (Dorst, 2019) reflective design practice.

5. Ethics and Reflection

Ethical awareness emerged as a significant learning outcome. Participants expressed concerns about authorship, originality, and transparency in the presentation of AI-generated content. As one remarked, *"I started to realize that if I don't mention I used AI, it feels dishonest. So I always include that information."* Many recognized the need to disclose AI contributions explicitly within their projects. Ethical reflection also extended to considerations of creative integrity. Students discussed how excessive dependence on AI could dilute personal expression and intellectual ownership. *"I don't want my project to look like the AI made it; I want to show my thinking,"* a participant reflected.

6. Recommendations for Future Use

Students proposed several practical recommendations for integrating AI in future design courses. These included clearer instructional frameworks for prompt formulation, more structured discussions on ethics, and access to curated AI datasets with localized cultural references. *"If we had examples of good prompts or a guide on how to balance manual and AI visuals, it would save time,"* one student suggested. Participants also recommended allocating time for reflective critique sessions to evaluate AI's influence on design outcomes. Such suggestions reflect a growing awareness of the need for institutional frameworks to guide AI literacy and ethical practice in design education.

DISCUSSION

This chapter discusses and interprets the research findings by linking them with existing theoretical perspectives and pedagogical frameworks. It elaborates on how Artificial Intelligence

(AI) influenced students' creativity, learning processes, and ethical reasoning during mood board development. The discussion follows an inductive structure, progressing from the interpretation of results to broader theoretical and pedagogical implications.

A. Interpreting Quantitative and Qualitative Results

The findings indicate that integrating AI into mood board development significantly enhances creative ideation and conceptual clarity; however, its impact is not linear or automatic. Rather than producing uniform improvements, AI-assisted workflows supported originality and complexity only when students engaged with the technology through deliberate keyword synthesis, iterative prompting, and critical visual selection. Some students who adopted AI early failed to achieve high originality scores due to insufficient synthesis between object and adjective keywords, resulting in superficial visual outcomes. Conversely, those who employed deliberate keyword refinement, iterative prompting, and digital imaging achieved more cohesive and distinctive designs. These results reaffirm that creative success depends not on the frequency of AI use but on the depth of critical engagement.

The development of complexity in mood boards also required iterative exploration. Students who achieved higher complexity scores typically experimented with multiple prompt variations and alternative visual angles before arriving at coherent compositions. This iterative experimentation fostered richer connections between material, color, and form, producing designs that demonstrated both variety and unity. Such iterative cycles of exploration and refinement align with (Dorst, 2019) concept of reflective design practice, where creativity emerges from continuous interpretation and adjustment.

In goal alignment, the results confirmed the pedagogical value of structured ideation. Students were directed to develop their keywords systematically based on the project's key message, tone, and manner. Through several rounds of mind mapping and reflection, they refined these descriptors into precise verbal anchors for visual direction. This structured verbal process helped most groups achieve conceptual coherence between the mood board and packaging design. However, one case illustrated the consequence of neglecting adjective-based descriptors: a group's final packaging lacked connection to its mood board, which resembled a random collage rather than a conceptual framework. This exception reinforces the idea that meaningful visual outcomes depend on linguistic precision and reflective synthesis, not merely on visual assembly.

B. Cognitive and Creative Implications

From a cognitive perspective, AI acted as an extension of students' creative cognition by broadening the range of visual stimuli and associative thinking available during ideation. The

interviews revealed that AI encouraged divergent exploration while still requiring human convergence in decision-making. Students described AI as an "idea amplifier," one that enabled them to visualize abstract concepts, textures, and moods more vividly. This pattern aligns with Oxman's (Oxman, 2004) view of computational systems as catalysts for hybrid creativity, in which human and machine cognition interact to generate new possibilities.

Nevertheless, the findings also illustrate that effective AI integration demands deliberate reflection. When students used AI outputs uncritically, the results often lacked originality or relevance. Those who iteratively modified prompts, evaluated AI's semantic interpretations, and curated results through digital editing demonstrated more control over the creative process. The human designer remains central, directing the process through interpretation rather than automation.

The findings also reaffirm (Munk et al., 2020) semiotic perspective of mood boards as visual systems of meaning. AI expanded these systems by providing new aesthetic configurations, yet it was human reasoning that imposed coherence and intent. Students' use of AI shifted the mood board from being a static collection of images to a dynamic site of negotiation between idea and representation. This interplay fostered metacognitive awareness, as students became more conscious of how their visual decisions translated conceptual meanings.

C. Ethical and Pedagogical Dimensions

Ethical reflection emerged as a significant educational dimension of AI-assisted learning. Students expressed awareness of the need for transparency in declaring AI's role in their creative process. Several participants acknowledged that omitting AI disclosure would feel "dishonest," demonstrating internalized ethical awareness. This aligns with Candy and Edmonds' (2018) argument that computational creativity should complement human agency rather than obscure it. Students' reflections also revealed an understanding that responsible use of AI includes critical reinterpretation, transforming generated material rather than reproducing it wholesale.

The project context provided a practical setting for discussing digital ethics, authorship, and intellectual integrity. As students navigated questions about originality and ownership, they simultaneously developed moral reasoning applicable to professional design practice. This pedagogical outcome extends beyond technical skills: it cultivates the capacity to critically evaluate one's creative decisions in relation to ethical standards. Such awareness echoes Fan et al.'s (2022) observation that AI-driven creative environments promote curiosity and exploration but require structured guidance to ensure accountability.

D. Human–AI Collaboration as Pedagogical Mediation

The study illustrates that AI can function as a cognitive collaborator when situated within a reflective, constructivist learning framework. AI did not replace students' creativity; rather, it mediated their exploration of ideas, serving as both a generator and a mirror for self-evaluation. AI operated as a "third voice" in the learning dialogue, prompting students to question, interpret, and justify their design decisions.

The feedback loop between human and machine, the generation of images, their evaluation, and subsequent refinement, created conditions for metacognitive growth. Students began to articulate their creative reasoning more explicitly, explaining how specific AI outputs influenced design direction. This process fostered self-awareness and design literacy, confirming that technological integration can strengthen rather than weaken reflective practice.

Pedagogically, these findings emphasize the importance of scaffolding AI use through structured reflection and guided critique. Educators should frame AI not as an autonomous producer but as a partner requiring thoughtful supervision. Classroom strategies may include guided exercises in prompt engineering, peer critiques focused on AI-human balance, and rubrics that emphasize originality, complexity, and coherence. Through such scaffolding, students can develop adaptive creativity, defined by the ability to integrate computational tools into personal design languages without losing agency or ethical sensitivity.

E. Broader Theoretical and Practical Implications

The implications of this study extend to both theory and practice. Theoretically, the findings contribute to an emerging understanding of hybrid creativity as a symbiotic interaction between human cognition and machine computation. By situating AI within mood board pedagogy, the research bridges computational creativity theory and design education practice. It affirms that creativity in the AI era is not solely about generation but about synthesis, reflection, and ethical authorship.

Practically, this study demonstrates that accessible AI platforms can democratize creative learning by offering students tools for exploration regardless of resource constraints. However, democratization must be accompanied by critical pedagogy to avoid superficial or homogenized outcomes. Institutions should therefore establish guidelines that balance innovation with integrity, promoting transparency, cultural sensitivity, and contextual relevance in AI-assisted design work. Furthermore, future research could extend these findings through longitudinal or cross-institutional studies to examine how sustained engagement with AI shapes creative autonomy and ethical awareness over time.

F. Summary of Discussion

In summary, AI-assisted mood board development enhances creative ideation and reflective learning but demands structured pedagogical mediation. The study confirms that creativity emerges from deliberate dialogue between human intention and algorithmic generation. Quantitative and qualitative findings jointly reveal that students who critically engaged with AI through iterative prompting, linguistic precision, and digital synthesis achieved the most coherent and original results. The discussion reinforces that AI's educational potential lies not in automating creativity but in cultivating a reflective partnership that deepens cognitive, aesthetic, and ethical understanding in design education.

G. Limitation

Although this study successfully demonstrated the pedagogical value of Artificial Intelligence (AI) in mood board development, several contextual boundaries should be acknowledged to appropriately frame its scope. The research was conducted within a single institution and involved a limited number of student groups, which may not fully represent broader design education settings. This focused sample, however, enabled an in-depth exploration of learning behaviors and creative processes in a controlled environment.

The mixed-method design, combining rubric-based assessment with thematic interpretation, prioritized depth of understanding over statistical generalization. While this approach effectively captured cognitive and ethical nuances, future studies could expand its scope through comparative or longitudinal designs to examine how creative and reflective skills evolve.

Technological and experiential diversity also influenced the results. Students used various AI platforms, each with different levels of accessibility and output quality, reflecting realistic classroom conditions. Likewise, differences in digital literacy and prompt formulation skills shaped individual learning trajectories. Rather than viewing these as weaknesses, they highlight the dynamic, adaptive nature of AI learning in design education and suggest the need for tailored scaffolding in future pedagogical applications.

The evaluation of ethical reflection was based primarily on students' self-reported narratives, which offered meaningful insights but may not fully capture behavioral transformation. Subsequent research could adopt follow-up assessments or project-based evaluations to explore how ethical awareness translates into professional practice. These boundaries reflect the exploratory nature of this research. By transparently identifying these contextual factors, the study establishes a constructive foundation for future inquiry into how AI can be more effectively and ethically integrated into creative learning environments.

CONCLUSION

This study reaffirms the essential role of mood boards as a fundamental tool in the ideation stage of the design process. In design education, teaching mood board development is critical because it nurtures students' abilities to synthesize research insights, define conceptual focus, and visually articulate design intent. Building upon this foundation, the study further demonstrates that integrating Artificial Intelligence (AI) into mood board development can meaningfully enhance creativity, reflection, and ethical awareness in graphic design education. Through mixed-method analysis, the research revealed that while AI-assisted workflows improved the quality of originality, complexity, and goal alignment, success depended not on the intensity of AI use but on the depth of reflective engagement in the design process. Students who combined careful keyword refinement, iterative prompting, and digital synthesis achieved the most coherent and original outcomes. The results further show that AI, when framed as a reflective collaborator rather than an automated generator, fosters higher-order thinking by prompting designers to evaluate, interpret, and justify their creative choices. Importantly, the inclusion of ethical reflection encouraged transparency, authorship acknowledgment, and responsible use of AI-generated content. Collectively, these findings contribute to the growing body of knowledge on hybrid creativity and computational pedagogy, emphasizing that design education must evolve toward integrating intelligent systems without diminishing human agency. Future research should explore longitudinal impacts of AI integration on creative autonomy, cultural sensitivity, and curriculum design across broader educational contexts.

Artificial Intelligence (AI) Disclosure

The authors declare that artificial intelligence tools were used solely for language editing and clarity improvement. All scientific content, analysis, and conclusions were developed entirely by the authors.

Acknowledgement

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by Politeknik Negeri Jakarta. (Grant number: 295.PL3.A.10/PT.00.06/2025)

REFERENCES

Anggarini, A., & Pramesti, R. D. (2025). Pengembangan Metode Kreatif Integrasi Mind Map dan Mood Board dalam Pemecahan Masalah Desain Grafis. *ANDHARUPA: Jurnal Desain Komunikasi Visual & Multimedia, 11*(1), 835–854. https://doi.org/10.33633/andharupa.v11i1.11677

Anggarini, A., & Maheni, M. T. (2022). *Model Penggunaan Mind Map dan Mood Board untuk Pengembangan Konsep dalam Proses Desain Grafis*. Penelitian internal, Politeknik Negeri Jakarta. https://sinta.kemdiktisaintek.go.id/authors/profile/6035868

Berni, A., Borgianni, Y., Rotini, F., Gonçalves, M., & Thoring, K. (2024). Stimulating Design Ideation with Artificial Intelligence: Present and (Short-Term) Future. *Proceedings of the Design Society*, *4*, 1939–1948. https://doi.org/10.1017/pds.2024.196

Braun, V., & Clarke, V. (2006). Using Thematic Analysis in Psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Brisco, R., Hay, L., & Dhami, S. (2023). Exploring the Role of Text-to-Image AI in Concept Generation. *Proceedings of the Design Society*, *3*, 1835–1844. https://doi.org/10.1017/pds.2023.184

Cassidy, T. (2011). The Mood Board Process Modeled and Understood as a Qualitative Design Research Tool. *Fashion Practice*, *3*(2), 225–251. https://doi.org/10.2752/175693811x13080607764854

Cassidy, T. D. (2008). Mood Boards: Current Practice in Learning and Teaching Strategies and Students' Understanding of the Process. *International Journal of Fashion Design, Technology and Education*, *1*(1), 43–54. https://doi.org/10.1080/17543260802015154

Choi, D., Hong, S., Park, J., Chung, J. J. Y., & Kim, J. (2024). CreativeConnect: Supporting Reference Recombination for Graphic Design Ideation with Generative AI. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems, CHI '24*, 1–25. https://doi.org/10.1145/3613904.3642794

Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). SAGE Publications. https://doi.org/10.1007/s11135-023-01798-2

Divyadharshini, P., Princi, R., Subashini, G., & Moohambgai, B. (2025). Virtual Reality in Adaptive Learning: Identifying Learning Styles and Integration in Educational Apps. *Journal of Technology Informatics and Engineering*, *4*(2), 261–276. https://doi.org/10.51903/jtie.v4i2.268

Dorst, K. (2019). Co-Evolution and Emergence in Design. *Design Studies*, *65*, 60–77. https://doi.org/10.1016/j.destud.2019.10.005

Dorst, K., & Cross, N. (2001). Creativity in the design process: Co-Evolution of Problem–Solution. *Design Studies*, *22*(5), 425–437. https://doi.org/10.1016/s0142-694x(01)00009-6

Endrissat, N., Islam, G., & Noppeney, C. (2016). *Visual Organizing: Balancing Coordination and Creative Freedom via Mood Boards*. *Journal of Business Research, 69(7)*, 2353–2362. https://doi.org/10.1016/j.jbusres.2015.10.004

Koch, J., Taffin, N., Beaudouin-Lafon, M., Laine, M., Lucero, A., & Mackay, W. E. (2020). ImageSense: An Intelligent Collaborative Ideation Tool to Support Diverse Human-Computer Partnerships. *Proceedings of the Acm on Human-Computer Interaction*, *4*(CSCW1), 1–27. https://doi.org/10.1145/3392850

Koch, J., Taffin, N., Lucero, A., & Mackay, W. E. (2020). SemanticCollage: Enriching Digital Mood Board Design with Semantic Labels. In *Proceedings of the 2020 ACM Designing Interactive Systems Conference*, 407–418. https://doi.org/10.1145/3357236.3395494

Lucero, A. (2012). Framing, Aligning, Paradoxing, Abstracting, and Directing: How Design Mood Boards Work. In *Proceedings of the Designing Interactive Systems Conference, DIS '12*, 438–447. https://doi.org/10.1145/2317956.2318021

Munk, J. E., Sørensen, J. S., & Laursen, L. N. (2020). *Visual Boards: Mood Board, Style Board or Concept Board?* In *DS 104: Proceedings of the 22nd International Conference on Engineering and Product Design Education (E&PDE 2020)*. https://doi.org/10.35199/epde.2020.47

Oxman, R. (2004). Think-maps: Teaching Design Thinking in Design Education. *Design Studies*, *25*(1), 63–91. https://doi.org/10.1016/s0142-694x(03)00033-4

Prasetya, D., Utami, I. I. B., & Pertiwi, S. (2025). From Static to Sentient: Designing Emotionally Responsive Interfaces Using Affective Computing for UX Enhancement. *International Journal of Graphic Design*, *3*(1), 120–136. https://doi.org/10.51903/ijgd.v3i1.2811

Rosyida, H. F., Syafei, A., & Nuha, M. U. (2025). The Evolving Field of Graphic Design: Challenges and Opportunities in the Integration of Artificial Intelligence. *International Journal of Graphic Design*, *3*(1), 19–38. https://doi.org/10.51903/ijgd.v3i1.2537

Runco, M. A., & Jaeger, G. J. (2012). The Standard Definition of Creativity. *Creativity Research Journal*, *24*(1), 92–96. https://doi.org/10.1080/10400419.2012.650092

Schetinger, V., Di Bartolomeo, S., El-Assady, M., McNutt, A., Miller, M., Passos, J. P. A., & Adams, J. L. (2023). Doom or Deliciousness: Challenges and Opportunities for Visualization in the Age of Generative Models. *Computer Graphics Forum*, *42*(3), 423–435. https://doi.org/10.1111/cgf.14841

Sivaranjani, S., & S, N. H. (2025). Transforming Fraud Detection in Banking with Explainable AI: Enhancing Transparency and Trust. *Journal of Technology Informatics and Engineering*, *4*(2), 251–260. https://doi.org/10.51903/jtie.v4i2.267

Sudha, S., & Nafeeza, S. (2025). Predicting and Inspecting Food Contamination Using AI based Hyperspectral Imaging. *Journal of Technology Informatics and Engineering*, *4*(2), 204–213. https://doi.org/10.51903/jtie.v4i2.266

Sugiarto, S., & Sultana, M. (2025). Critical Speculations In AI Design: Ethical Narratives And Visual Experiments In Post-Human Aesthetic Practices. *International Journal of Graphic Design*, *3*(1), 81–101. https://doi.org/10.51903/ijgd.v3i1.2873

Yvier, E., & Eizstvkov, T. (2025). Technological Trends In Digital And Interactive Media For Heritage Design: A Systematic Literature Review. *International Journal of Graphic Design*, *3*(2), 279–294. https://doi.org/10.51903/ijgd.v3i2.3100