A Conceptual Framework for Integrating Generative AI in Advertising Image Creation for Graphic Design Education

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ABSTRACT

Generative artificial intelligence (AI) has transformed creative practice, enabling designers to visualise complex ideas through human machine collaboration. Yet, its pedagogical integration within graphic design particularly in advertising image creation remains underdeveloped. This conceptual paper proposes a framework for integrating generative AI into advertising education, aiming to balance technological innovation with human creativity and ethical responsibility. Drawing on constructivist learning theory, the componential model of creativity, and the Technology Acceptance Model, the framework outlines four iterative phases: **Concept Formation**, **AI-Assisted Ideation**, **Human Refinement**, and **Critical Evaluation**. Each phase is supported by three cross-cutting principles: **Ethical Practice**, **Pedagogical Guidance**, and **Creative Authenticity**. The model positions AI as a cognitive partner that enhances divergent and convergent thinking while preserving human interpretive agency. Discussion of the framework highlights its pedagogical implications for curriculum design, reflective assessment, and educator training. By situating the discourse within global and regional contexts of design education, this study contributes to the evolving scholarship on human-AI collaboration in creative pedagogy. The framework offers a practical and ethical pathway for preparing future-ready designers capable of navigating the hybrid creative ecology of Industry 5.0.

Keywords - Generative Artificial Intelligence; Graphic Design Education; Advertising Design; Conceptual Framework; Creativity; Pedagogical Innovation

INTRODUCTION

The emergence of generative artificial intelligence (AI) technologies has fundamentally reshaped how visual content is conceptualized, produced, and communicated across creative industries. Tools such as DALL·E 3, Midjourney, and Stable Diffusion allow designers to translate text-based prompts into highly detailed images, fostering new modes of human–machine collaboration and accelerating visual ideation. Recent studies in marketing and communication demonstrate that generative AI enhances both efficiency and creative exploration, expanding the possibilities for innovation and personalization (Grewal, Satornino, Davenport, & Guha, 2025; McKinsey & Company, 2023; Toubia & Bodapati, 2025). In advertising, AI is evolving from a productivity tool into a co-creative partner that shapes concept development, message framing, and aesthetic direction (Cui, Yuan, & Liu, 2025). Yet, despite its growing industrial influence, design education especially advertising-oriented courses continues to lack structured pedagogical models to guide its effective and ethical integration.

Traditionally, graphic design education has emphasised human-centred creative processes that develop visual literacy, conceptual reasoning, and storytelling. The integration of generative AI challenges these traditions by enabling instant visualization, potentially disrupting established learning processes and assessment norms. Emerging research indicates that AI can enhance divergent and convergent thinking when applied within intentional pedagogical structures, allowing students to iterate ideas more fluently (Melker, Gabrils, &

Villavicencio, 2025). However, other studies warn that uncritical adoption may lead to dependency, reduced originality, and creative homogenization (Hartmann, Exner, & Domdey, 2025). Thus, educators must balance technological innovation with critical reflection, ensuring that students use AI as a creative support system rather than as a replacement for human insight and authorship (Yuan & Wu, 2024).

Within global and regional contexts, scholars have begun to re-examine how curricula in art and design respond to generative technologies. Hwang and Wu (2025) highlight the transition of graphic design programs toward content creation and hybrid skill development, while Lan (2025) emphasises the importance of structured integration of AI tools in classroom learning. Similarly, Kiliánová, Kočková, and Kostolányová (2024) argue that AI's impact on design education represents a paradigm shift, requiring pedagogical innovation that merges creativity, ethics, and digital literacy. These findings underline the urgent need for a coherent conceptual framework that specifically addresses advertising image creation a critical domain where creativity, persuasion, and technology intersect most dynamically.

To address this gap, this paper proposes a conceptual framework for integrating generative AI in advertising image creation within graphic design education. The framework draws upon creativity theory, technology adoption models, and design pedagogy to define progressive stages of AI-assisted ideation, human refinement, and critical evaluation. It aims to guide educators in designing curricula that promote human AI collaboration while preserving creative authenticity and ethical awareness. By positioning this study within both global and educational perspectives, the paper contributes to the broader discourse on preparing future designers for an industry increasingly shaped by generative intelligence.

LITERATURE REVIEW

Generative AI in Creative Industries

Generative AI has become a transformative force in creative production, redefining how ideas, narratives, and visuals are generated across sectors. McKinsey & Company (2023) report that generative models contribute substantially to productivity and innovation in marketing, design, and entertainment, demonstrating potential to reshape creative workflows. In advertising, AI tools increasingly function as co-creators that enhance ideation, automate repetitive tasks, and optimize message delivery (Cui, Yuan, & Liu, 2025). Similarly, Grewal, Satornino, Davenport, and Guha (2025) highlight that marketers now integrate generative AI not merely for efficiency but for expanding creative possibilities and personalization at scale. Hartmann, Exner, and Domdey (2025) empirically show that AI-generated marketing visuals can rival human work in persuasion and aesthetic value, suggesting a convergence between computational and human creativity. Toubia and Bodapati (2025) further note that AI-driven data synthesis offers new insights for concept testing and consumer research, creating a feedback loop between creative generation and market intelligence. Collectively, these studies affirm that generative AI is not a peripheral trend but a catalyst for a broader reconfiguration of the creative economy.

Generative AI in Design and Graphic Design Education

Within design education, the integration of AI has sparked both enthusiasm and concern. Melker, Gabrils, and Villavicencio (2025) argue that generative tools can enhance divergent and convergent thinking processes when embedded within structured pedagogical contexts, improving students' ideation fluency. Yuan and Wu (2024) similarly contend that AI empowerment in graphic design fosters innovative approaches to composition and form-finding, enabling learners to explore multiple creative directions rapidly. Yet, the pedagogical implications remain complex. As Kiliánová, Kočková, and Kostolányová (2024) explain, AI's introduction requires rethinking the role of the instructor from technical expert to creative facilitator who guides interpretation, ethics, and reflection. Lan (2025) adds that systematic integration of AI tools should be accompanied by critical discussions about authorship and bias, ensuring that students engage in conscious, value-driven design. Taken together, the literature underscores that AI's educational value depends less on technological sophistication than on how it is pedagogically contextualized.

Pedagogical Shifts in Advertising Design Education

Advertising design represents a unique pedagogical challenge because it merges creativity, communication strategy, and cultural sensitivity. Hwang and Wu (2025) describe how the proliferation of text-to-image generators compels a shift from traditional composition training toward content-creation and conceptual development skills. Their findings indicate that educators must cultivate students' ability to curate and critically evaluate AI outputs rather than merely produce visuals. In this sense, AI serves as a creative collaborator that stimulates ideation but still requires human direction to achieve persuasive and contextually appropriate outcomes. Hartmann et al. (2025) reinforce this by showing that even advanced generative systems rely on human framing to translate computational novelty into meaningful advertising narratives. The educational focus thus pivots from technical execution to creative orchestration the capacity to integrate AI outputs into coherent communicative strategies.

Theoretical Foundations for Integrating Generative AI

The adoption of generative AI in design pedagogy can be grounded in several interrelated theoretical lenses. From a **constructivist** perspective, learners construct meaning through interaction with technology; AI becomes a mediating tool that facilitates experimentation and reflection. The **Technology Acceptance Model (TAM)** explains how perceived usefulness and ease of use influence students' willingness to adopt AI tools, suggesting that pedagogical framing is critical to positive learning outcomes. Moreover, contemporary creativity theories, including the **componential model of creativity**, emphasize the interplay of domain-relevant skills, creative processes, and motivation each of which can be augmented, but not replaced, by AI assistance (Melker et al., 2025). These frameworks collectively suggest that effective integration of generative AI requires balancing automation with agency, ensuring that learners maintain cognitive ownership of creative decisions.

Synthesis and Research Gap

The reviewed literature converges on three insights: (1) generative AI is rapidly transforming creative production and marketing communication; (2) its educational integration can enhance ideation and innovation when guided by sound pedagogy; and (3) advertising design, despite being highly impacted by AI, lacks a consolidated framework that aligns creative learning outcomes with emerging technologies. While prior studies have explored AI in general design education, none provide a comprehensive model dedicated to advertising image creation in graphic design curricula. This conceptual gap justifies the development of a structured framework to guide educators in balancing technological potential with creative authenticity and ethical responsibility.

CONCEPTUAL FRAMEWORK

Framework Rationale

The preceding literature indicates that while generative AI enhances creative efficiency and idea exploration (Cui et al., 2025; Grewal et al., 2025; Melker et al., 2025), its educational adoption requires a structured model that safeguards human creativity and critical reflection (Lan, 2025; Yuan & Wu, 2024). The conceptual framework proposed here synthesises insights from the **Technology Acceptance Model (TAM)**, **constructivist learning theory**, and the **componential model of creativity** to guide how educators can integrate generative AI into advertising image creation within graphic-design education. The framework treats AI as both a creative partner and a learning mediator, positioning students as reflective co-creators who orchestrate ideas through iterative human–AI interaction.

Framework Overview

The model comprises four progressive phases Concept Formation, AI-Assisted Ideation, Human Refinement, and Critical Evaluation supported by three cross-cutting principles: Ethical Practice, Pedagogical Guidance, and Creative Authenticity.These phases mirror real-world advertising workflows while embedding cognitive

and ethical checkpoints essential for higher education.

Component Descriptions

Phase 1: Concept Formation

Students begin with market or client briefs, audience profiling, and message development. At this stage, learning activities emphasise research, brainstorming, and analog ideation to establish conceptual depth before any AI intervention (Hwang & Wu, 2025). Educators encourage divergent thinking through sketching, storyboarding, or word-association exercises, cultivating the human insight that will later steer AI prompts. The pedagogical intent is to ensure that the creative direction originates from human context and communicative purpose.

Phase 2: AI-Assisted Ideation

Generative AI tools are introduced to expand visual possibilities rapidly. Students translate conceptual keywords into structured prompts, exploring composition, mood, and symbolism through multiple AI-generated outputs. This stage aligns with exploratory constructivism, where learners experiment and evaluate machine-generated suggestions (Melker et al., 2025; Cui et al., 2025). Instructors facilitate reflective comparison why certain outputs resonate conceptually while others fail to reinforce analytical skills and aesthetic judgment.

Phase 3: Human Refinement

Selected AI images are refined using traditional design software or manual interventions. Students adjust layout, typography, and visual hierarchy to integrate human craftsmanship with algorithmic inspiration (Lan, 2025; Kiliánová et al., 2024). This hybrid stage reinstates human control and interpretation, transforming raw AI imagery into contextually persuasive advertising visuals. Educators guide students to document their decision-making process, evidencing creative agency and intentionality.

Phase 4: Critical Evaluation

The final phase centres on critique, ethics, and reflection. Learners evaluate originality, message alignment, and audience impact while addressing copyright, bias, and authenticity concerns (Hartmann et al., 2025). Peer review sessions and reflective journals help students internalise the principles of responsible AI usage. Assessment rubrics combine creativity, conceptual clarity, technical execution, and ethical reasoning aligning with emerging accreditation standards for design curricula.

Illustrative Example: Applying the Framework in a Classroom Context

To exemplify the operational flow of the proposed framework, consider a student project within an advertising design course. In **Phase 1 (Concept Formation)**, the student begins with a client brief requiring a promotional visual for a sustainable coffee brand. After researching the target audience and message tone, the student develops initial concept sketches and mood keywords. Moving into **Phase 2 (AI-Assisted Ideation)**, the student inputs these keywords into DALL·E 3 to generate a range of concept visuals, exploring different colour palettes and brand atmospheres. In **Phase 3 (Human Refinement)**, one selected image is refined in Adobe Photoshop the student adjusts composition, integrates custom typography, and enhances visual hierarchy to align with brand identity. Finally, during **Phase 4 (Critical Evaluation)**, the student documents the process in a reflective journal, analysing creative choices, acknowledging AI's contribution, and addressing ethical considerations such as data provenance and content authenticity. This example demonstrates how generative AI can be pedagogically embedded in iterative, reflective design practice.

Cross-Cutting Principles

1. **Ethical Practice** – Students must understand intellectual-property implications, prompt transparency, and bias awareness when employing AI outputs.

2. **Pedagogical Guidance** – Educators act as facilitators who integrate AI tasks within learning outcomes and ensure alignment with design-thinking methodologies.

3. **Creative Authenticity** – Assignments and assessments prioritise human interpretation, ensuring AI augments rather than replaces student creativity.

Figure Layout Description

Figure 1 Integrative Model for Generative AI in Advertising Image Creation

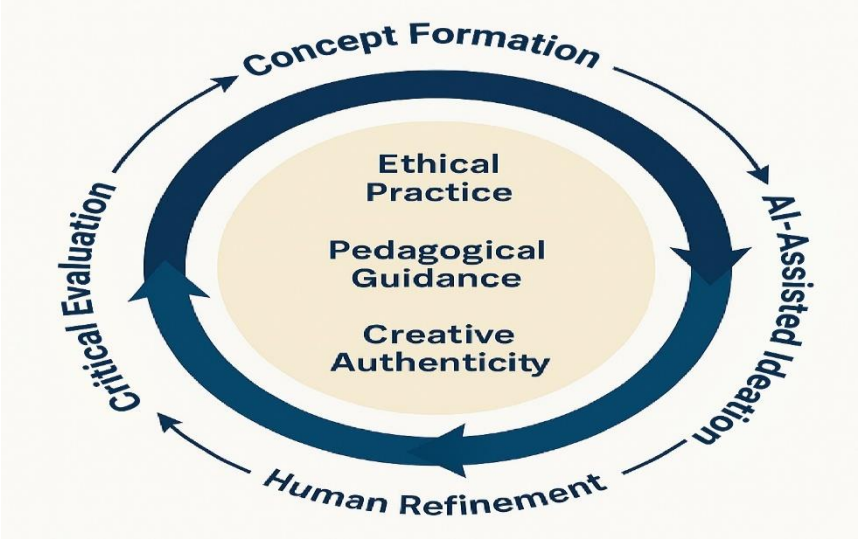

Figure 1 should visualise the **Integrative Model for Generative AI in Advertising Image Creation** as a circular or spiral process illustrating the cyclical nature of learning and iteration:

- **Outer ring:** the four sequential phases — Concept Formation → AI-Assisted Ideation → Human Refinement → Critical Evaluation.
- **Inner core:** the three guiding principles — Ethical Practice, Pedagogical Guidance, and Creative Authenticity.
- **Bidirectional arrows:** show continuous feedback among phases, reflecting the iterative relationship between human insight and AI generation.
  This design highlights the dynamic loop where learning, making, and reflecting coexist rather than follow a strictly linear order.

Pedagogical Implications

The framework positions generative AI not as a technological disruption but as a pedagogical evolution. It provides educators with a structured pathway to scaffold creative inquiry, enhance ideation efficiency, and maintain ethical rigor. By embedding iterative reflection and human refinement within AI-mediated design processes, the model supports future-ready graduates capable of leveraging generative technologies while preserving the essence of human creativity.

DISCUSSION

Interpreting the Framework in Contemporary Context

The proposed framework positions generative AI not as a technological disruption but as a **pedagogical catalyst** for rethinking creativity, authorship, and collaboration in advertising design. As McKinsey & Company (2023) note, the widespread integration of generative systems across creative industries has heightened demand for professionals who can combine strategic thinking with technological fluency. In this regard, the framework reflects a shift from teaching static design skills toward cultivating adaptive intelligence the ability to think, make, and critique within a human–machine ecosystem. Grewal, Satornino,

Davenport, and Guha (2025) emphasise that successful use of generative AI requires both creative insight and ethical awareness, echoing the framework's insistence on **ethical practice** and **creative authenticity** as central pedagogical principles.

The model's cyclical structure moving from concept formation to AI-assisted ideation, human refinement, and critical evaluation embodies the iterative nature of design thinking while embedding opportunities for reflection at each stage. By allowing students to oscillate between divergent exploration and convergent decision-making, it operationalises what Melker, Gabrils, and Villavicencio (2025) describe as "AI-enhanced cognitive iteration." This dual process encourages learners to test conceptual hypotheses through generative experimentation while retaining human authorship through refinement and critique. It also aligns with Hwang and Wu's (2025) observation that graphic-design education must transition from image production toward content curation and contextual reasoning, skills increasingly vital in AI-mediated creative industries.

Pedagogical Implications

The framework has direct implications for curriculum design, teaching strategies, and assessment in graphic-design programs. First, it redefines the educator's role from that of software instructor to that of creative facilitator who guides meaning-making and ethical reasoning (Kiliánová, Kočková, & Kostolányová, 2024). Lessons structured around the four phases can help students integrate generative tools within authentic design briefs thereby promoting situated learning consistent with constructivist theory. Second, assessment methods should evolve beyond static artefacts to include **process portfolios** and **reflective documentation** that capture how students formulate prompts, evaluate AI outputs, and justify aesthetic decisions. Such practices reinforce transparency and critical engagement, addressing Lan's (2025) call for frameworks that foreground reflection rather than automation.

For institutions, adopting this model supports alignment with Industry 5.0 educational priorities, which emphasise human-centric innovation and ethical integration of intelligent technologies. In regional contexts like Malaysia, where digital-creative sectors are expanding, the framework can help bridge policy initiatives on digital transformation with classroom realities. By embedding ethical, creative, and technological competencies into advertising education, universities can nurture future-ready designers capable of contributing to both local industries and global creative economies.

Opportunities and Benefits

Applying generative AI through the proposed structure offers several pedagogical benefits. It broadens students' visual vocabulary, accelerates iterative ideation, and fosters experimentation unconstrained by technical limitations (Cui, Yuan, & Liu, 2025). AI also supports inclusive participation by enabling students with differing drawing or software proficiencies to visualise ideas quickly. Moreover, by incorporating peer review during the **critical-evaluation** phase, educators can cultivate collaborative learning communities that mirror professional creative teams. Hartmann, Exner, and Domdey (2025) further suggest that such co-creative processes can elevate the persuasive and aesthetic quality of advertising outcomes, illustrating how AI-mediated collaboration enriches conceptual depth rather than diminishing originality.

Challenges and Ethical Considerations

Despite its promise, generative AI introduces challenges that educators must address proactively. Chief among these are concerns of **intellectual property**, **authorship transparency**, and **algorithmic bias** (Yuan & Wu, 2024). Students may inadvertently reproduce copyrighted or biased imagery generated from opaque training datasets. Hence, explicit instruction in ethical prompting, attribution, and data provenance is essential. Furthermore, without critical scaffolding, overreliance on AI outputs could weaken students' ability to visualise independently or to develop personal aesthetic identities. Kiliánová et al. (2024) argue that maintaining creative diversity requires structured reflection on how and why certain AI results are selected or modified a practice fully embedded in the framework's refinement and evaluation phases.

Theoretical and Practical Contributions

The framework contributes to design-education scholarship by synthesising creativity theories with technology-adoption perspectives. It extends the **Technology Acceptance Model** into an art-education context, where perceived usefulness is linked not to productivity but to creative empowerment. It also operationalises the **componential model of creativity** (domain skills, processes, and motivation) in a digital learning environment, showing how each element interacts with AI mediation. Practically, the model provides educators with a roadmap to structure lessons, define learning outcomes, and assess creative growth within AI-enhanced curricula. The integration of ethical and pedagogical principles ensures that the framework remains adaptable to different institutional and cultural contexts, promoting responsible innovation rather than technological determinism.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This conceptual paper has proposed a structured framework for integrating **generative artificial intelligence (AI)** into advertising image creation within **graphic design education**. Grounded in creativity theories, constructivist learning principles, and technology adoption models, the framework emphasises that generative AI should function not as a replacement for human creativity, but as an intelligent collaborator that enhances ideation, reflection, and innovation. Through its four key phases Concept Formation, AI-Assisted Ideation, Human Refinement, and Critical Evaluation the model provides a systematic approach for embedding AI into the design-learning process while safeguarding ethical practice and creative authenticity.

The framework contributes to the evolving discourse on **AI literacy and creative education** by demonstrating how design pedagogy can adapt to emerging technologies without compromising human ingenuity. It extends the conceptual boundaries of art and design education, situating generative AI as a pedagogical instrument for developing future-ready designers who can navigate complex intersections between creativity, ethics, and technology. As highlighted across global studies (Cui, Yuan, & Liu, 2025; Melker, Gabrils, & Villavicencio, 2025; Hwang & Wu, 2025), educators play a pivotal role in ensuring that AI integration cultivates critical consciousness rather than passive consumption. By adopting reflective and iterative teaching strategies, institutions can align creative education with Industry 5.0 values of human-centric innovation.

Recommendations

Pedagogical Implementation

Educators should adopt the proposed four-phase model as a scaffold for classroom activities, progressively introducing AI tools within conceptual and practical assignments. Each phase should include reflection checkpoints where students articulate creative intent, ethical awareness, and evaluative reasoning. Institutions may develop teaching guidelines or workshops to familiarise lecturers with prompt design, AI ethics, and evaluation rubrics suited for advertising courses.

Curriculum Development and Policy Alignment

Higher education authorities and curriculum developers should integrate AI literacy and creative ethics as key learning outcomes within design programs. As McKinsey & Company (2023) and Grewal et al. (2025) suggest, professionals of the future will require hybrid competencies that merge strategic thinking, data literacy, and creative expression. Embedding these skills at the diploma and undergraduate levels will ensure that graduates remain adaptable in technology-driven creative economies.

Ethical and Assessment Frameworks

Institutions should establish clear policies regarding authorship, intellectual property, and transparency in the use of generative AI outputs. Assessment criteria should evaluate both process and product, rewarding critical

engagement, creative iteration, and ethical compliance rather than technical proficiency alone. This aligns with Lan's (2025) recommendation that assessment in design education should foreground reflective learning rather than automation outcomes.

Professional Development for Educators

Current and future design educators play a decisive role in bridging the gap between traditional creative pedagogy and AI-augmented design practice. However, many existing faculty members in art and design institutions lack the technical and conceptual proficiency to effectively use generative AI tools and integrate them into classroom learning. This competency gap encompasses both technical literacy including prompt engineering, model bias awareness, and AI-assisted workflow management and pedagogical literacy, such as the ability to design reflective assignments and assess hybrid human–AI outputs (Lan, 2025; Yuan & Wu, 2024). Therefore, professional development should move beyond general upskilling to focus on structured capacity-building initiatives that combine theory, ethics, and hands-on experimentation. Targeted workshops, interdisciplinary collaborations with computer science or media departments, and ongoing micro-credential programs can equip educators with practical knowledge of generative systems like DALL·E, Midjourney, or Stable Diffusion while reinforcing their critical understanding of AI's creative limitations. As Melker, Gabrils, and Villavicencio (2025) argue, such dual emphasis on technological fluency and reflective pedagogy is essential for sustaining creative diversity and maintaining the educator's guiding role in AI-driven learning environments.

Future Research Directions

While this study provides a theoretical foundation, the next critical step is to **empirically validate the proposed framework** in real educational settings. Future research should examine how the model functions across diverse design programs through mixed-methods approaches, such as classroom-based interventions, educator interviews, and student learning assessments. Such empirical testing will not only verify the framework's effectiveness but also refine its phases and principles according to contextual factors like institutional readiness, cultural variation, and resource accessibility. Longitudinal and comparative studies could further explore how sustained exposure to generative AI influences students' creativity, ethical awareness, and design-thinking capabilities. By prioritizing this empirical agenda, future scholars can transform the conceptual foundation developed in this paper into evidence-based pedagogical models that advance the discourse on AI-driven creativity in design education.

Final Remark

The integration of generative AI into advertising design education signals a paradigm shift toward a hybrid creative ecology, where human and machine intelligence intersect to produce new forms of expression and learning. The conceptual framework developed in this paper serves as a scholarly foundation for this transition, offering educators a structured pathway to navigate AI integration ethically and creatively. Moving forward, empirical testing and iterative validation of this framework should be prioritised to establish measurable pedagogical impact and cross-cultural applicability. By fostering reflective, technologically fluent designers, the education system can not only adapt to rapid digital change but also shape the future of creative communication with integrity and imagination.

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