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The Designer's Dilemma: Evaluating Hekkert's ViP and Brown's Design Thinking Through the Lens of Generative AI

ABSTRACT

Examining Paul Hekkert's Vision in Product Design (ViP) and Tim Brown's Design Thinking, this paper interrogates their relevance in an era increasingly shaped by generative artificial intelligence. Both methodologies emerged from pre-AI paradigms ViP from Delft University's industrial design tradition (1990s–2011) and Design Thinking from IDEO's human-centered consultancy practice (2009). While each offers distinct approaches to fostering creativity, empathy, and structured innovation, the rapid integration of AI tools into design education raises fundamental questions about their continued validity. Through comparative analysis of primary texts, systematic literature review of recent empirical studies (2024–2026), and critical examination of AI capabilities, this paper argues that both methods exhibit significant limitations when confronted with AI's capacities in pattern recognition, idea generation, and user research simulation. However, their core values contextual awareness (ViP) and empathic engagement (Design Thinking) remain indispensable. The analysis further identifies an experience dependent asymmetry: AI augments novice designers' ideation while supporting experienced designers' refinement. Drawing on recent empirical evidence, the paper proposes a hybrid pedagogical framework that preserves human-centric values while strategically integrating AI as a collaborative design partner. The analysis suggests that design education must evolve from teaching fixed methodologies to cultivating metacognitive skills that enable designers to orchestrate human–AI creative collaboration.

Keywords: Design thinking; Vision in Product design (ViP); Generative artificial intelligence; Design education; Design methodology; Empathy in design; Human-AI collaboration

1. Introduction: The Convergence of Design Methodologies and Artificial Intelligence

In the last ten years, design thinking has become a popular way to innovate in business, along with the more academic Vision in Product Design (ViP) approach. Tim Brown's Change by Design (2009) made design thinking well-known as a method that is easy to understand and focuses on people. It can be used in areas other than design, such as healthcare and public policy. At the same time, Paul Hekkert and Matthijs van Dijk's Vision in Design (2011) provided a strict, context-based framework that puts building future worlds ahead of coming up with new products. Both texts represent mature articulations of design methodologies developed during the late twentieth and early twenty-first centuries (Brown, 2009; Hekkert & van Dijk, 2011).

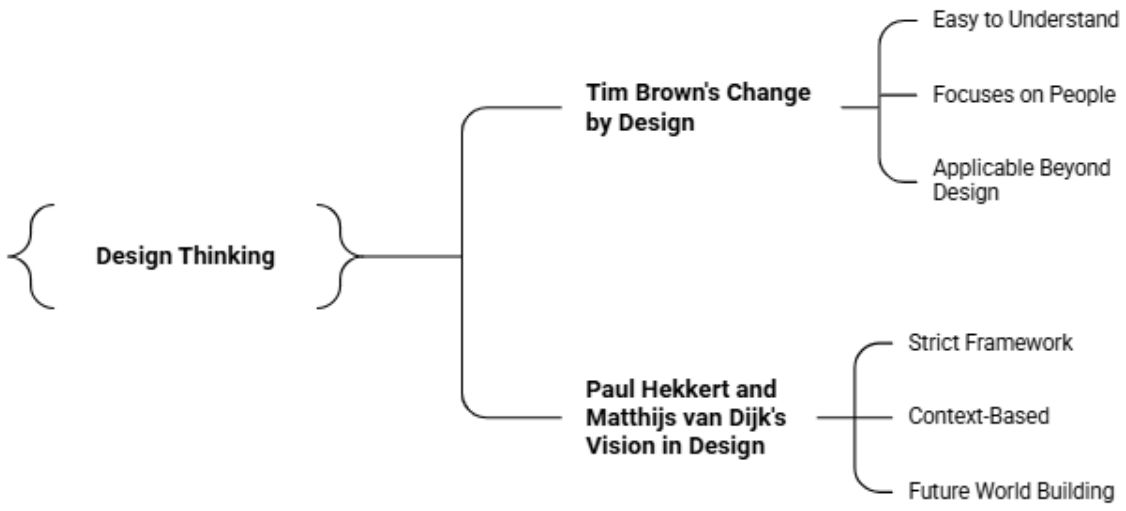

Fig. 1. Design Thinking Vs. Vision in Product Design

Generative AI systems large language models, image synthesis tools, and predictive analytics are now fundamentally challenging the assumptions underlying both approaches. Design Thinking's emphasis on empathy through ethnographic observation confronts AI's ability to simulate user behaviours and generate synthetic research data. ViP's complex context-building exercises confront AI's capacity to process vast information landscapes and discern patterns that may elude human perception. Recent empirical research has begun to quantify these tensions. A randomized crossover study of 52 undergraduate design engineering students found that AI support preserved fluency and originality but increased semantic convergence, with ideas more frequently resembling existing products and exhibiting reduced textual elaboration (Kim et al., 2025). Notably, students who began with AI support produced more original and diverse ideas across both AI-assisted and unaided tasks, suggesting a lasting positive transfer effect (Kim et al., 2025). However, qualitative analysis revealed predominantly passive and directive use of AI, with limited exploratory or collaborative engagement (Kim et al., 2025).

These developments compel a critical reassessment: Are these methodologies still pedagogically viable? Or do they require fundamental restructuring? This paper pursues three primary objectives designed to interrogate the intersection of established design frameworks and emerging computational technologies.

Objective 1: Conceptual Explication of ViP and Design Thinking

The initial phase entails a thorough understanding of the fundamental principles underpinning both methodologies through methodical close reading of primary theoretical texts. This establishes a deep comprehension of their philosophical foundations, examining how these frameworks interpret human experience, context, and designerly intentionality (Brown, 2009; Hekkert & van Dijk, 2011).

Objective 2: Critical Tension Mapping in the Age of AI

Building on this theoretical framework, the paper identifies and analyses ontological and functional conflicts between conventional design approaches and the evolving capabilities of artificial

intelligence. This section contrasts the algorithmic logic of generative models with the human-centric heuristics of Design Thinking, highlighting particular 'friction points,' including:

- **The Intentionality Gap:** The shift from designer-led visioning to prompt-based iteration. Recent work on AI image-generation technologies has conceptualized this as a transition from a 'history path' to a 'generation cycle,' where traditional iterative processes are replaced by prompt-driven cycles that produce entirely new imagery at each step (Zhang & Wang, 2025).
- **Synthetic vs. Empirical Empathy:** The difficulty of preserving user-centricity when direct human observation is replaced by data-driven synthesis. A mixed-methods study of 112 undergraduate students found that while 86% of responses to GenAI integration were positive, ethical concerns generated significant negative sentiment (62%), with students developing strategies for bias detection and source validation (Rana et al., 2025).
- **Computational Opacity:** The tension between the 'black box' character of AI-generated outputs and the reflective practice central to ViP (Schön, 1983).

Objective 3: Proposed Pedagogical Adaptations

The final objective culminates in the development of robust pedagogical adaptations for design curricula. Recognizing that the future of the field is increasingly intertwined with AI-augmented workflows, the paper proposes a recalibrated educational framework that preserves what is uniquely human while strategically leveraging computational capabilities.

2. Novel Approach

This study employs an interpretive, comparative, and critical methodology to investigate two established design frameworks through the lens of artificial intelligence, guided by three research questions:

First, what are the foundational principles and pedagogical assumptions of Brown's Design Thinking and Hekkert's ViP, and how do their approaches to creativity, user understanding, and problem-solving differ?

Second, which specific aspects of these methodologies are threatened, augmented, or rendered obsolete by generative AI capabilities including automated research synthesis, pattern recognition, ideation support, and prototype generation? Recent evidence indicates that AI-generated content significantly enhances design learning effects by improving usability, boosting students' intrinsic motivation and learning experiences, and elevating creativity across multiple dimensions including relevance, novelty, elaboration, and thoroughness (Chen et al., 2025). However, the same study cautioned against overdependence on AI and identified learning barriers requiring pedagogical intervention (Chen et al., 2025).

Third, how should design education evolve to maintain the human-centered values of these methodologies while integrating AI as a collaborative tool rather than a substitute for designerly thinking?

This analysis distinguishes itself by moving beyond both celebratory and alarmist positions on AI, offering a nuanced critique that identifies both vulnerabilities and enduring strengths within each methodology while grounding claims in recent empirical evidence. The paper contributes to emerging

discourse on AI-augmented design pedagogy while avoiding techno-deterministic conclusions. Recent theoretical work has proposed structured frameworks such as the Human-AI Co-Creative Design Process (HAI-CDP) model, which empirical comparative studies have shown substantially improves creative performance over traditional design processes (Lee & Park, 2025). This paper extends such work by examining how established design methodologies specifically ViP and Design Thinking can be adapted within such co-creative frameworks.

3. Research Methodology

This study adopts a qualitative, comparative, and critical framework to investigate the intersection of traditional design frameworks and generative technologies. The investigation commences with a rigorous textual analysis of Hekkert and van Dijk's Vision in Design (2011) and Brown's Change by Design (2009) to isolate their core pedagogical assumptions and implicit theories of creativity. These frameworks are then subjected to a systematic comparative analysis across dimensions such as contextual treatment, the role of empathy, and designer agency. To anchor this theoretical foundation within contemporary practice, a comprehensive literature review integrates recent empirical studies spanning 2024 to 2026, focusing on AI integration in design education and its impact on human-AI co-creative processes. This synthesis informs a critical interrogation of AI capabilities against traditional design assumptions, drawing on literature from human–computer interaction and design pedagogy to identify points of ontological conflict or synergy. Finally, the research derives propositional recommendations for curriculum modification and competency frameworks informed by recent intervention studies. While the scope of this paper is theoretical and does not include original empirical classroom trials, it serves as a rigorous conceptual basis for generating hypotheses to guide future empirical investigation.

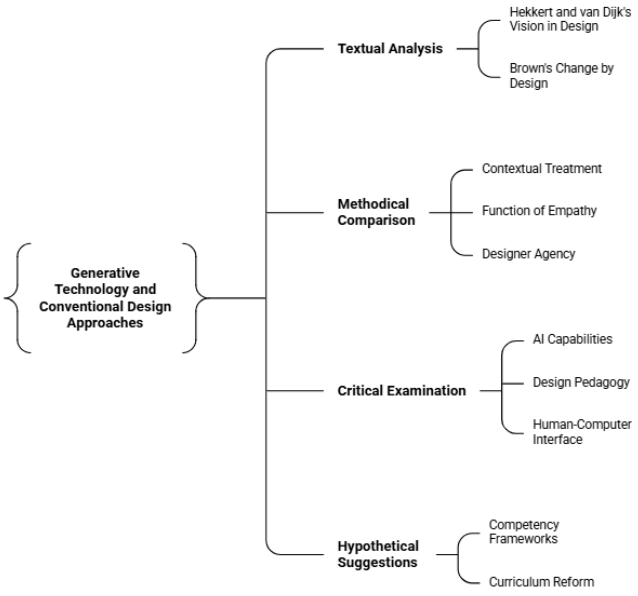

Fig. 2. Research Methodology

4. Deconstructing Two Design Methodologies: An Inferred Analysis

4.1 Vision in Product Design (ViP): Context-Driven Design

As a response to both purely technical engineering approaches and solely aesthetic styling, Hekkert and van Dijk's ViP emerged from industrial design education at Delft University of Technology (Hekkert & van Dijk, 2011). The methodology's three-layer model context, interaction, and product constitutes its core innovation.

- **The Context Layer:** ViP requires designers to construct a ‘future world’ prior to conceiving solutions. This context comprises factors: principles (stable human universals), states (relatively stable conditions), developments (changing phenomena), and trends (behavioural tendencies). Critically, context is not discovered but constructed by the designer through deliberate selection and composition. As Hekkert states, "The context is not a given, but a construction of the designer" (Hekkert & van Dijk, 2011). This constructive act is where recent AI-based context generation tools could either augment or undermine designerly agency.

- **The Interaction Layer:** Between context and product lies interaction the qualitative relationship between user and product. ViP uses invented descriptors to characterize interactions (‘confident zapping,’ ‘soothing surrender’), capturing the gestalt of the user–product encounter. Because "the product to be designed can only absorb meaning in relation to a user" (Hekkert & van Dijk, 2011), this layer is essential.

- **The Product Layer:** Only after context and interaction are defined does the designer address product qualities and, ultimately, tangible features. This sequence reverses conventional design processes that begin with product specifications.

- **Core Values:** ViP explicitly champions freedom, responsibility, and authenticity. The designer must be free from premature constraints, accountable for design choices, and authentic in personal vision (Hekkert & van Dijk, 2011).

4.2 Design Thinking: Human-Centered Innovation

As articulated in Change by Design, Brown's Design Thinking emerged from IDEO's consultancy practice and gained popularity as a management and innovation tool (Brown, 2009). Its accessibility has facilitated widespread adoption across sectors.

- **The Three Spaces:** Brown characterizes inspiration, ideation, and implementation as overlapping spaces rather than sequential stages. This non-linear framing acknowledges the iterative, exploratory nature of creative activity. Recent research on integrating generative AI into this framework has shown that AI tools can be effectively deployed across divergent and convergent phases, particularly when structured within established design process models (Wu et al., 2025).

- **The Desirability-Feasibility-Viability Triad:** Successful design balances what is desirable from a human perspective, technologically feasible, and economically viable (Brown, 2009). This triad provides a practical framework for evaluating design concepts a framework that AI can inform but not adjudicate.

- **Empathy as Method:** Design Thinking emphasizes empathy as "the effort to see the world through the eyes of others" (Brown, 2009). Techniques include ethnographic observation, analogous experiences (e.g., checking into a hospital as a patient), and immersion in user contexts. Whether AI can authentically contribute to this empathic stance remains contested.

- **Prototyping Culture:** "Thinking with your hands" through rapid, iterative prototyping is central. Brown advocates "failing early to succeed sooner" and emphasizes that prototypes should be "quick, rough, and cheap" (Brown, 2009). AI image generation and 3D synthesis now dramatically accelerate early-stage visualization, though physical prototyping retains unique value.

4.3 Comparative Analysis

Table 1. A Comparative Analysis for both Approaches

Dimension	**ViP (Hekkert)**	**Design Thinking (Brown)**
Primary Domain	Academic industrial design	Corporate/business innovation
Temporal Orientation	Future world construction (5-15 years)	Future world construction (5-15 years)
User Role	Implicitly defined through context factors	Actively observed and empathized with
Process Structure	Hierarchical (context→interaction→product)	Non-linear, overlapping spaces
Key Output	Vision (statement + interaction + qualities)	Prototype (tangible, testable)
Designer Stance	Authentic, responsible, free	Empathetic, experimental, optimistic
Role of Constraints	Deferred as long as possible	Embraced as creative fuel
Theoretical Grounding	Design methodology, psychology, philosophy	Business strategy, ethnography, pragmatism

5. AI's Challenge to Design Methodology Assumptions

The fundamental tenets of both ViP and Design Thinking are called into question by generative AI systems, especially big language models (GPT-4, Claude) and picture generators (Midjourney, DALL-E, Stable Diffusion).

5.1 Challenges to ViP

- **Context Construction:** ViP assumes that context formation is an exclusively human act of value expression, synthesis, and selection (Hekkert & van Dijk, 2011). However, AI can now

analyze millions of documents, identify emerging patterns, and generate plausible "future worlds" at scales unattainable for human researchers. A quasi-experimental study of 38 industrial design students found that AI-assisted classes achieved higher creativity and design quality, supported by enhanced efficiency and faster iteration across five project phases: research, ideation, design simulation, reporting, and prototyping (Tan & Lim, 2025). The question thus arises: Is designerly context construction still valuable when AI can generate more comprehensive, data-driven contexts? The evidence suggests the answer is affirmative but qualified AI augments but does not replace designerly judgment.

- **Interaction Descriptors:** ViP's invented interaction qualities rely on poetic, metaphorical language that expresses tacit, embodied knowing. While AI currently generates competent but often generic descriptors, research on designer intuition in AI-augmented workflows has identified that intuition plays a pivotal role during early ideation stages, gradually diminishing as design clarity increases but remaining integral throughout (Zhang & Wang, 2025). The distinction between authentic designer articulation and AI-generated description may thus persist where tacit, embodied knowledge is required.

- **Authenticity and Responsibility**: ViP's core value of authenticity assumes a singular designer-author. AI collaboration complicates authorship: When AI contributes significantly to context generation or concept development, whose vision prevails? How is responsibility allocated? A study of 112 undergraduate students using GenAI across Design Thinking's five stages found that students evolved from passive users to critical evaluators, developing strategies for bias detection and source validation—suggesting that authenticity and responsibility become more rather than less important in AI-augmented workflows (Rana et al., 2025).

5.2 Challenges to Design Thinking

- **Empathy and Observation:** Design Thinking's emphasis on firsthand ethnographic observation assumes that direct human encounter yields unique insights inaccessible through secondary sources (Brown, 2009). AI cannot (yet) experience being a patient in an emergency room or a subsistence farmer in Ethiopia. However, AI can synthesize thousands of ethnographic accounts, identify patterns across studies, and generate realistic user personas and scenarios. The critical question—whether this constitutes a form of "synthetic empathy" remains unresolved. Evidence suggests that AI-assisted assessment shows low statistical agreement with human instructors for empathy and pain point identification, with teachers consistently preferring human-assigned scores for these dimensions (Khan et al., 2025). This suggests that empathy remains a domain where human judgment is not easily automated.

- **Brainstorming:** Brown champions brainstorming as a collaborative ideation method, citing evidence that teams building on each other's ideas produce more creative outcomes (Brown, 2009). AI can now generate hundreds of variations on a theme, integrate concepts from disparate domains, and participate in human–AI brainstorming sessions. A randomized crossover study found that AI-assisted ideas more frequently resembled existing products and exhibited reduced semantic divergence, suggesting convergence in the way ideas were formulated (Kim et al., 2025). This finding complicates the assumption that AI simply expands creative possibility; it may also channel ideation toward predictable patterns.

- **Prototyping:** AI image generation and 3D model synthesis dramatically accelerate prototyping. What once required days in a model shop can now be generated in minutes. AIGC-based design methods have demonstrated high usability throughout all four design thinking stages, enhancing students' intrinsic motivation and learning experiences while improving creative outcomes in relevance, novelty, elaboration, and thoroughness (Chen et al., 2025). However, this efficiency gain challenges Brown's emphasis on "thinking with your hands," though it may democratize prototyping for those without access to physical workshops.

5.3 Shared Vulnerabilities

- **User Research Automation:** Both methodologies assume that user research requires human presence, observation, and interpretation (Brown, 2009; Hekkert & van Dijk, 2011). AI systems can now analyze customer reviews, social media discussions, support tickets, and usage data to produce insights that may complement or even precede human observation. A study integrating ChatGPT and Midjourney into divergent and convergent design phases found that the educational model fostered students' creativity and problem-solving skills while demonstrating the efficacy of AI integration in design curricula (Wu et al., 2025).

- **Idea Generation Quantity**: Both approaches value divergent thinking and generating many options. AI excels at combinatorial creativity, producing vast numbers of variations. The bottleneck shifts from generation to evaluation and selection a shift requiring new pedagogical emphases on curation and critical judgment.

- **Pattern Recognition:** Both ViP's clustering of context factors and Design Thinking's synthesis of observations depend on human pattern recognition. AI's ability to identify non-obvious correlations and patterns in complex datasets challenges the uniqueness of human synthetic capabilities. However, research also indicates that AI effectiveness in creative tasks is experience-dependent: for novice designers, AI's primary value lies in facilitating idea generation, whereas for experienced designers, it contributes more to elevating the quality and refinement of creative outcomes (Lee & Park, 2025).

6. SWOT Analysis: ViP and Design Thinking in the AI Era

- **Strengths (Preserved)**

  Human Embodied Knowing: Both methods value tacit, embodied knowledge that AI cannot replicate the feeling of using a product, the emotional resonance of an experience, the ethical weight of a design decision. Research on designer intuition in AI-augmented workflows confirms that intuition remains integral throughout the creative process, fluctuating in intensity but never disappearing (Zhang & Wang, 2025).

  Value Articulation: ViP's explicit values (freedom, responsibility, authenticity) and Design Thinking's implicit humanism provide ethical frameworks that AI lacks. Studies show that GenAI, when pedagogically scaffolded, augments rather than replaces human judgment, with students developing epistemic vigilance as they learn to critically evaluate AI outputs (Rana et al., 2025). Designers must articulate why certain futures are worth building a task beyond current AI capabilities.

Contextual Judgment: Both methods require judgment about which factors matter, which trade-offs are acceptable, and which directions are worth pursuing. AI can inform but not replace this judgment. Research on human–AI co-creation indicates that effective collaboration depends on assigning tasks where AI's strengths (scalability and precision) complement rather than substitute for human judgment (Norman, 2013; Simon, 1996).

Stakeholder Alignment: The social processes of design building consensus, negotiating trade-offs, aligning diverse stakeholders remain fundamentally human activities that AI can support but not lead (Cross, 2011).

- **Weaknesses (Exposed)**

Time-Intensive Research: Both methods require extensive upfront research (context building in ViP, ethnographic observation in Design Thinking). AI can dramatically accelerate these phases. A quasi-experimental study showed that AI-assisted classes applied AI tools across five project phases, achieving higher creativity and design quality through enhanced efficiency and faster iteration (Tan & Lim, 2025).

Limited Pattern Capacity: Human designers can only process limited information. AI can identify patterns across datasets of millions, potentially revealing factors human researchers would miss.

Ideation Bottlenecks: Human brainstorming sessions produce dozens of ideas; AI can generate thousands. The bottleneck shifts from generation to evaluation and selection a shift requiring new assessment approaches. Research on AI-assisted creative ideation found predominantly passive and directive use, with limited exploratory or collaborative engagement, suggesting that students require pedagogical guidance to move beyond passive consumption of AI outputs (Kim et al., 2025).

Prototyping Fidelity Gaps: Physical prototyping remains valuable, but AI-generated visualizations can communicate design intent faster and more cheaply for early-stage exploration.

- **Opportunities**

Hybrid Context Building: AI could generate preliminary context analyses that designers then refine, question, and personalize preserving ViP's emphasis on designerly construction while leveraging AI's processing power.

AI as Empathy Amplifier: AI could synthesize user research from multiple sources, identify marginalized perspectives, and help designers develop richer empathic understanding before field research, while preserving direct human observation for validation and depth.

Generative Prototyping Co-pilot: AI could generate multiple concept variations, allowing designers to explore broader solution spaces before committing to physical prototyping. Studies have demonstrated that AIGC-based design methods significantly enhance usability, boost intrinsic motivation, and elevate creativity across multiple dimensions including relevance, novelty, elaboration, and thoroughness (Chen et al., 2025).

Metacognitive Skill Development: Rather than teaching fixed methodologies, design education could emphasize the metacognitive skills needed to orchestrate human–AI creative collaboration. The Human–AI Co-Creative Design Process (HAI-CDP) model provides one structured framework for such integration, with empirical evidence showing substantial improvement in creative performance over traditional design processes (Lee & Park, 2025).

- **Threats**

Methodological Obsolescence: Students may perceive traditional design methods as irrelevant when AI can produce "good enough" outputs faster, potentially devaluing the slow, reflective practices that ViP and Design Thinking champion. Studies caution against overdependence on AI and identify learning barriers requiring pedagogical intervention (Chen et al., 2025).

Erosion of Empathy: Over-reliance on AI-generated user insights might reduce designers' motivation for direct human engagement, undermining the empathic foundation of both methods. A study on AI-assisted assessment found low agreement between AI scores and human instructors for empathy and user understanding, with teachers expressing concerns about AI's limitations in capturing contextual nuance and creative insight (Khan et al., 2025).

Homogenization of Output: If all designers use similar AI tools with similar training data, design outputs may converge, reducing the diversity and originality that both methods value. Research on AI-assisted ideation found that while thematic diversity was preserved, semantic divergence was significantly lower, suggesting convergence in the way ideas were formulated (Kim et al., 2025).

Attribution and Authorship Confusion: When AI contributes significantly to context, interaction, or product definitions, questions of credit, responsibility, and ownership become legally and ethically ambiguous. Studies report that students raised concerns about authorship ambiguity and bias as significant issues requiring pedagogical attention (Rana et al., 2025).

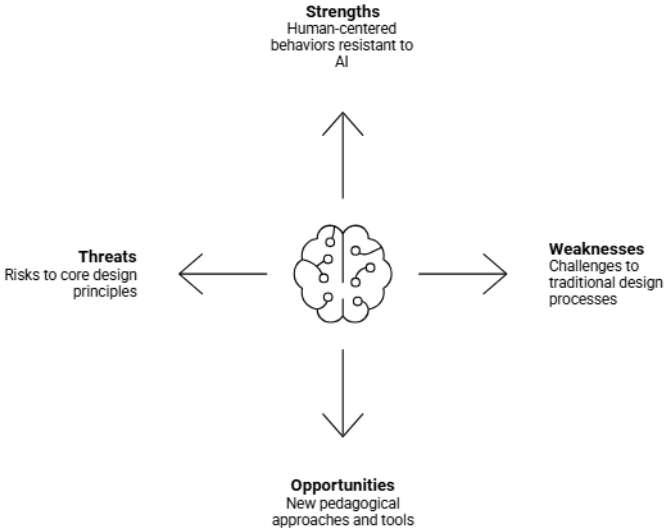

Fig. 3. SWOT Analysis

7. Pedagogical Implications: Toward AI-Augmented Design Thinking

The analysis suggests that neither wholesale rejection nor uncritical adoption of AI tools is appropriate. Instead, design education should evolve in four key directions.

7.1 From Methodology to Metacognition

Rather than teaching ViP or Design Thinking as rigid procedures, educators should emphasize the metacognitive skills of selecting, adapting, and orchestrating methods including knowing when to use AI tools and when to set them aside. Students need frameworks for deciding: Does this phase of the process benefit from AI acceleration, or does it require human-only engagement? Studies have shown that students who began with AI support produced more original and diverse ideas across both AI-assisted and unaided tasks, suggesting a lasting positive transfer effect when AI is introduced early and pedagogically guided (Kim et al., 2025).

The development of critical AI literacy emerges as a multidimensional competence encompassing creativity, ethics, and critical reasoning essential for navigating AI-mediated learning environments (Rana et al., 2025). This includes "epistemic vigilance" the ability to critically evaluate AI outputs, recognize embedded biases, and verify claims which students developed through structured engagement with GenAI tools across design stages (Rana et al., 2025).

7.2 AI as Collaborative Partner, Not Replacement

AI should be positioned as a design collaborator with specific affordances and limitations. The Human–AI Co-Creative Design Process (HAI-CDP) model provides one structured approach, demonstrating that such frameworks substantially improve creative performance, particularly through experience-dependent effects: for novice designers, AI facilitates idea generation; for experienced designers, AI contributes more to elevating the quality and refinement of creative outcomes (Lee & Park, 2025).

Students should learn to:

- Prompt AI for context factor generation while maintaining critical distance
- Use AI for synthetic user research while validating through direct observation
- Generate AI concept variations as stimuli for human refinement
- Distinguish between AI-combinatorial creativity and human-original creativity
- Develop strategies for bias detection and source validation (Rana et al., 2025)

7.3 Preservation of Embodied Practice

Hands-on making, direct user observation, and physical prototyping remain essential not despite AI but because of it. These embodied practices cultivate the tacit knowledge and empathic resonance that differentiate human design from AI generation. Research on designer intuition confirms that intuition plays a pivotal role during early ideation stages, diminishing only as design clarity increases (Zhang & Wang, 2025). Design programs should protect time and space for these activities even as they

integrate AI tools, recognizing that the haptic, sensory, and empathic dimensions of design resist algorithmic capture.

A critical insight from assessment research is that teachers preferred human-assigned scores for empathy and pain point identification, highlighting limitations of AI in capturing contextual nuance and creative insight (Khan et al., 2025). This reinforces the importance of preserving human-led empathic practices rather than ceding them entirely to AI.

7.4 Ethical and Critical AI Literacy

Students need frameworks for critically evaluating AI outputs, recognizing embedded biases, understanding data provenance, and maintaining accountability for AI-influenced design decisions. Studies have shown that GenAI, when pedagogically scaffolded, augments rather than replaces human judgment, with students evolving from passive users to critical evaluators (Rana et al., 2025). However, the same research reveals that concerns about bias and authorship ambiguity remain significant 62% of negative sentiment in student responses related to ethical concerns (Rana et al., 2025).

ViP's values of responsibility and authenticity (Hekkert & van Dijk, 2011) become particularly relevant here. Educators should help students navigate the ethical complexities of AI collaboration, including questions of attribution, the risk of homogenization, and the maintenance of critical distance from AI-generated outputs.

8. Conclusion: Synthesizing Human and Machine Intelligence

ViP and Design Thinking represent sophisticated responses to design challenges that predate the widespread availability of generative AI (Brown, 2009; Hekkert & van Dijk, 2011). Their core insights that context matters, that interaction precedes product, that empathy is essential, that prototyping accelerates learning remain valid. However, their specific procedures and temporal assumptions require reconsideration in light of AI's capabilities.

The AI era does not render these methodologies obsolete but demands their adaptation. ViP's context construction can be augmented by AI-generated factor analyses while preserving designerly judgment in selection and composition. Design Thinking's empathy phase can be accelerated by AI synthesis of existing research while preserving direct human observation for validation and depth. The emerging evidence supports this hybrid approach: AI-assisted classes achieve higher creativity and design quality when AI is integrated within reflective and human-centered pedagogical frameworks (Tan & Lim, 2025).

An important insight from recent research concerns the differential impact across designer experience levels. AI's value is not uniform: novice designers benefit most from AI's ideation support, while experienced designers leverage AI for refinement and quality elevation (Lee & Park, 2025). This suggests that pedagogical integration of AI should be phased and adaptive rather than one-size-fits-all.

Most fundamentally, both methodologies must evolve from teaching how to design to teaching how to orchestrate human–AI design collaboration. The designer of the future is not replaced by AI but elevated to a new role: curator of possibilities, arbiter of values, and steward of the human experiences that remain beyond computation. As one study concludes, AI can serve as a valuable cognitive and

creative partner when integrated within a framework that maintains critical thinking, originality, and ethical responsibility (Tan & Lim, 2025).

9. Contributions of the Study

Theoretical Contribution: This paper advances discourse on design methodology by systematically analyzing how two influential frameworks ViP and Design Thinking are challenged by generative AI, identifying specific points of tension and complementarity. It further integrates recent empirical evidence (2024–2026) to ground these theoretical claims in emerging research.

Practical Contribution: The analysis offers concrete recommendations for design educators seeking to integrate AI tools while preserving human-centric values, including proposed shifts in curriculum emphasis, new competency frameworks (metacognitive orchestration, critical AI literacy), and phased integration strategies tailored to student experience levels.

Critical Contribution: By avoiding both techno-optimism and techno-pessimism, the paper provides a balanced framework for evaluating AI's role in design education, recognizing both genuine threats (homogenization, empathy erosion, authorship confusion) and genuine opportunities (enhanced creativity, accelerated iteration, democratized prototyping).

10. Limitations and Further Recommendations

Limitations: This paper is theoretical and propositional rather than empirical. It does not evaluate specific AI tools in classroom settings, nor does it measure learning outcomes from AI-augmented design pedagogy. The analysis is also limited to generative AI as it exists at the time of writing; rapid technological change may outpace analysis.

Further Recommendations: Future research should conduct longitudinal studies of design students using AI tools across complete projects, comparing learning outcomes with traditional methodology instruction. Empirical investigations should examine whether AI augmentation enhances or diminishes creative originality, critical thinking, and empathic engagement over extended timeframes. Additionally, design researchers should develop and test specific hybrid methodologies that systematically integrate AI capabilities while preserving human values, building on frameworks such as HAI-CDP (Lee & Park, 2025).

Assessment practices require particular attention. Research indicates that current AI-assisted assessment shows low agreement with human instructors for empathy-related dimensions (Khan et al., 2025), suggesting the need for hybrid assessment models that integrate computational efficiency with human judgment. Finally, the ethical dimensions of AI integration including authorship attribution, bias mitigation, and data provenance require continued scholarly attention and pedagogical development.

11. Broader Context: Cultural and Social Relevance

This study situates design methodology within broader questions about human creativity in an age of increasingly capable machines. The tensions identified between efficiency and reflection, between automation and authenticity, between pattern recognition and judgment extend beyond design to all

creative and knowledge work. How design education resolves these tensions may offer models for other disciplines grappling with similar challenges.

The stakes extend beyond pedagogy to fundamental questions about human agency. If AI can generate plausible contexts, produce competent interactions, and render convincing prototypes, what remains uniquely human? This paper has argued that values freedom, responsibility, authenticity, empathy remain beyond computation. But preserving these values requires intentional pedagogical design, not technological inevitability. As one study concluded, "GenAI, when pedagogically scaffolded, augments rather than replaces human judgment" (Rana et al., 2025), suggesting that the challenge is not to resist AI but to orchestrate its integration in ways that amplify rather than diminish what is distinctly human in design practice.

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