

EXPLORING THE IMPACT OF COLLABORATIVE AI ON EMERGING SKILL SETS IN DESIGN JOBS: A QUALITATIVE INVESTIGATION

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Abstract

Artificial intelligence (AI) is reshaping design practice by automating production and augmenting creative decision-making. This study examines how collaborative AI tools influence designers' workflows, skills, and creative control. Twenty-one semi-structured interviews were conducted with designers, art directors, and AI developers. AI supports idea generation and low-risk experimentation, while designers remain essential for contextual, cultural, and aesthetic judgment. Three emerging competencies define effective collaboration: prompt formulation, evaluative discernment, and orchestration across tools and stages. Human–AI partnerships enhance efficiency without replacing creative authorship. Findings contribute to understanding evolving skill sets and highlight the need for AI literacy and ethical awareness in design education and industry training.

Keywords: Artificial intelligence, collaboration, creative industries, design skills, skill development

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Introduction

Artificial Intelligence (AI) automates production workflows, accelerating ideation and experimentation in design. Its value is greatest when used as a collaborator rather than a replacement, augmenting designer capability and creative direction. Generative tools rapidly produce layout variations and prototypes but still struggle with context, nuance, and brand coherence. This shift moves design from simple tool use toward ‘teammate orchestration,’ requiring designers to guide, critique, and integrate AI outputs.

Industry adoption of AI in design is widespread, with over 70% of professionals now experimenting with generative tools (Adobe, 2023; Precedence Research, 2024). However, academic understanding lags these changes. Research has mainly examined automation and efficiency, providing limited insight into how AI transforms human expertise, collaboration, and creative identity. This study addresses that gap by examining AI as a collaborator in creative work rather than a technical tool.

Drawing on insights from twenty-one design professionals, this study investigates how collaborative AI reshapes roles, workflows, and skill requirements. Specifically, this study explores three key questions:

RQ1: What new skills are essential for effective human–AI collaboration in design?

RQ2: Where do AI tools add value, and where do they fall short in complex creative tasks?

RQ3: How are design responsibilities and workflows being reconfigured through AI integration?

The findings reveal that productivity gains coexist with new demands on designers' competencies, particularly in prompt formulation, critical evaluation, and managing human–AI collaboration. The study makes both theoretical and practical contributions. It advances the understanding of skill transformation in human–AI collaboration and offers actionable guidance for educators and design teams to sustain creativity while integrating AI tools responsibly.

Literature Review

AI is transforming how designers conceptualise and produce visual content in creative industries. Prior research shows that AI accelerates ideation and repetitive processes, allowing designers to test multiple variations quickly (Holm & Lorenz, 2022; Matthews et al., 2023). Yet, creative outcomes still depend on human capacity for contextual and aesthetic judgment (Seeber et al., 2020). The designer’s role is shifting from execution to orchestration, managing human–AI collaboration.

Studies highlight that AI’s value in design goes beyond automation. Designers act as interpreters, translating creative vision into effective prompts and refining outputs through iterative critique. This aligns with the emerging notion of AI literacy. Bérubé and Béland (2021) define AI literacy as a combination of technical fluency, ethical reasoning, and contextual decision-making required for responsible AI integration into professional workflows.

Despite these developments, few empirical studies examine how these competencies are applied in real-world design practice. Existing literature is largely conceptual, focusing on tool capabilities or ethical speculation, and the professional skill dimension remains underexplored. To address this gap, this study examines how designers adopt and adapt collaborative AI systems in their everyday work.

Guiding Propositions

Building on the literature, three propositions inform this study:

P1: Collaborative AI transforms the designer’s role from technical execution to orchestration; this shift requires metacognitive and managerial skills.

P2: Effective human–AI collaboration depends on designers’ ability to frame prompts and evaluate AI outputs, ensuring alignment with creative intent.

P3: Emerging AI literacy, encompassing ethical awareness, contextual interpretation, and adaptability, defines future-ready design competencies.

These propositions provide the analytical foundation for the study, shaping its focus and interpretation.

Research Methods

Research design

This study adopts a qualitative, interpretivist design to explore how collaborative AI influences design practice. Guided by Creswell (2013), the interpretivist approach enables an in-depth understanding of participant experiences. Action-research principles were applied to bridge design practice and theory, enabling reflective iteration.

Data collection

Data was collected through twenty-one semi-structured interviews with professionals across agencies, freelance, and in-house contexts. Participants were recruited using purposive and snowball sampling (Patton, 2002) to ensure diverse roles, experience levels, and settings. Interviews were conducted online (with consent), recorded, and transcribed verbatim, each lasting 45-60 minutes.

Ethical considerations

Ethical approval was obtained before data collection, and all participants provided informed consent with confidentiality assured. Identifying details were removed, and pseudonyms were used to maintain confidentiality.

Data analysis

Transcripts were coded and analysed thematically (Braun & Clarke, 2006). Initial coding captured recurring patterns of AI use, collaboration, and evolving competencies, which were then refined into higher-order themes. Patterns were examined across the four guiding propositions (P1–P4) established in the literature review. Lincoln and Guba (1985) criteria of credibility, dependability, and confirmability guided the assessment of qualitative rigor. Reflexive memoing and an audit trail documented analytical decisions, strengthening transparency.

Data transparency and limitations

Representative anonymised excerpts are included in the findings to illustrate perspectives; complete transcripts are securely stored and available upon request. While the sample size limits generalizability, the study provides transferable insights relevant to professional design contexts. Regional concentration may also influence perspectives, contextual limitations.

Findings and Discussion

Experience with AI tools

Sixteen of 21 participants (76%) reported occasional use of AI tools in their workflows. Most cited significant time savings and increased productivity in early design stages. Junior designers described AI as a creative accelerator, particularly for idea generation and layout exploration. As one junior designer noted, *'If I'm doing it manually, it takes me almost three hours to make a storyboard, but using Adobe Firefly, it takes only 30 minutes'* (JGD4). Another participant explained, *'It's like having a brainstorming partner that never gets tired; it pushes me to explore new visual ideas'* (SGD2).

Usage patterns varied by role: junior designers experienced the greatest time savings, while senior designers were more selective, typically applying AI for repetitive or exploratory tasks. Art directors and developers emphasised governance, workflow integration, and the need for oversight. These findings align with Seeber et al. (2020), who argue that outcomes in human-AI collaboration depend on both technological familiarity and creative autonomy. Grounded in participants' lived experiences, this study extends that work by showing how creative professionals integrate AI tools into real-world design workflows.

Impact on design work

Participants widely agreed that AI enhanced speed and variety, especially during early design phases such as prototyping and background manipulation. Time savings, particularly in ideation and asset generation, were cited as the most immediate benefit by 14 of 21 participants (67%). However, many emphasised that AI outputs often lacked originality, emotional tone, and sensitivity to brand context. As a creative director noted, *'AI gives me drafts, but I still decide what feels right for the brand; it can't read emotion or tone'* (CD1). A senior designer added, *'Sometimes it gives too many options, and that's another kind of overload we need to manage'* (SD2).

While AI accelerated workflows, participants emphasised the need for human oversight in client-facing or culturally sensitive projects. They viewed AI as most effective in low-risk, exploratory phases, where volume and variation are advantageous, but consistently reinforced the importance of human judgment in refining outputs for

brand alignment and narrative nuance. These findings complement earlier concerns raised by Kaiser (2019) and Kelly (2018) about AI’s lack of contextual awareness and limited creative judgment.

Collaboration, skills, and project complexity

Perceptions of AI’s usefulness varied strongly with project type (Table 1). A large majority (17 of 21; 81%) found AI tools most valuable in low-stakes or exploratory tasks such as rapid prototyping and internal mock-ups. In contrast, nearly all participants (18 of 21; 86%) emphasised the necessity of human oversight in brand-sensitive or high-visibility projects. These findings highlight project complexity as a moderating factor: AI is embraced when risks are minimal, but constrained where originality, cultural nuance, or reputational stakes are high.

Participants identified emerging competencies required for effective AI collaboration across different project contexts. Prompt engineering was consistently cited as a foundational skill (12 of 21; 57%). It enables designers to frame problems and guide AI toward outputs that align with their creative intent. Evaluative judgment was emphasised by an even larger share of participants (15 of 21; 71%). Respondents noted that AI-generated outputs often required refinement to achieve contextual accuracy, brand alignment, and cultural sensitivity. Some participants described orchestration as a ‘meta-skill’ involving the sequencing of tasks across multiple tools and determining where human oversight is essential. One AI developer remarked, ‘Good prompting feels like negotiation, you have to guide the model to get what you really want’ (AID1). A senior designer echoed, ‘You can’t just press a button; you have to decide what’s usable and what feels human’ (SGD3).

These competencies are illustrated in Table 1, which maps design tasks to typical tools used, their value, and identified risks. Table 1 shows that AI accelerates ideation, layout variations, and background manipulation, but is less effective for tasks requiring brand coherence or narrative flow. Designers, therefore, operate less as isolated creators and more as curators and integrators of AI-assisted content, ensuring efficiency gains do not compromise originality or reputational integrity. This theme directly responds to RQ3, aligning with Holm and Lorenz (2022) and Matthews et al. (2023), who highlighted prompt formulation and evaluative judgment as emerging design competencies. The present study substantiates those claims empirically, demonstrating that these skills, along with orchestration, define the evolving role of designers as ‘process architects’ in AI-mediated creative production.

Table 1:
Where collaborative AI helps and where human oversight dominates

Task/phase	Tools typically used	Perceived value	Typical use cases	Primary risks/limits	Oversight needed
Ideation & rapid variants	Midjourney, Firefly, DALL·E	High	Mood boards, campaign mock-ups	Generic style, originality concerns	Human curation for brand fit
Layout/options & prototyping	Image + text models	Medium–High	Alternatives, quick prototypes	Inconsistent hierarchy/context	Designer sets constraints
Background manipulation	Image models	High	Product shots, composites	Edge artefacts, tone mismatch	Visual QA
Storyboarding	Image + text models	Medium	Early sequences	Narrative coherence	Human sequencing
UI testing/low-risk trials	Assistive tools	Medium	Speed checks, variants	Over-reliance	Designer sign-off
Brand-sensitive identity work	—	Low (AI assist only)	Core identity, cultural messaging	Nuance/originality	Human-led throughout

(Source: Author’s compilation) Note: Competencies were derived from thematic analysis of participant interviews.

Taken together, these findings underline that collaborative AI is not replacing designers but reconfiguring their role. Where projects are low-risk, AI offers speed and variety; where the stakes are higher, human oversight and judgment remain central. The emerging competencies of prompting, evaluation, and orchestration suggest that designers are evolving into process architects who integrate machine capabilities without compromising creative integrity. This naturally extends to a broader question of how such redefined roles will shape the future trajectory of human-AI collaboration in design, which is explored in the next section.

A central assumption in both industry discourse and early scholarship is that Artificial Intelligence will eventually replace human designers or diminish the value of human creativity. This study’s findings directly challenge that notion. Across all interview categories, participants described AI as an enabler rather than a substitute, a collaborator that expands ideation breadth but depends on human judgment for contextual and cultural sensitivity. The evidence shows that rather than eliminating creative labour, AI is redistributing it, shifting designers’ focus from production tasks toward higher-order orchestration and critical evaluation. This reconfiguration of work challenges the replacement narrative and underscores the significance of developing frameworks that position AI

as a collaborative partner in creativity rather than a threat to it. These findings not only clarify how AI is reshaping creative work but also reveal broader implications for theory, education, and professional practice.

Implications

These findings have several important implications for both theory and practice. Theoretically, these findings extend models of creative collaboration by explicitly including AI as an active collaborator whose contributions still require human orchestration and ethical oversight. This shift moves beyond the automation paradigm toward co-agency and implies that future design theory should account for shared authorship between humans and AI systems.

In practice, our results highlight the need for organisational strategies and educational curricula to prepare designers to work effectively in mixed human-AI environments. For industry, this means upskilling practitioners in prompt engineering, evaluative judgment, and workflow orchestration. It also requires establishing clear boundaries for human oversight in brand-sensitive projects and ethical decision-making. For design education, integrating AI literacy and ethical reflection into curricula will ensure that future professionals approach AI as a creative partner, not a threat.

Practical, managerial, and policy implications

Beyond individual competencies, the findings suggest several actionable strategies for organisations and policymakers. For example, design firms and in-house teams should develop structured training programs that build AI literacy and encourage critical engagement with AI-generated outputs instead of passive adoption. Additionally, managers should establish clear internal policies specifying when AI-generated content can be used and when human sign-off is required, as well as how credit and accountability are shared between humans and machines. At the policy level, professional associations and educational institutions could collaborate to establish ethical frameworks and accreditation standards for AI use in the creative industries. Such measures would help ensure that AI integration enhances, rather than erodes, creative integrity, transparency, and trust across the design ecosystem.

Limitations

This study has several limitations. The sample of 21 professionals (sufficient for qualitative saturation) limits the generalizability of the findings beyond similar creative industries. Since most participants came from the Middle East, South Asia, and Southeast Asia, regional cultural and organisational factors may have influenced their perspectives. Because the data relies on self-reported experiences rather than direct observation, participants' responses may reflect biases or memory errors. Finally, the study captures a single moment in a rapidly evolving technological landscape. Longitudinal or comparative studies could provide deeper insights into how designer-AI collaboration evolves. Despite these limitations, the study provides credible insights into emerging practices and competencies in professional design settings.

Conclusion

This study explores how collaborative AI reshapes skill requirements in design jobs, based on interviews with 21 design and related professionals. The findings indicate that although AI enhances productivity, ideation, and prototyping efficiency, its benefits depend on the project's complexity. Low-risk, exploratory tasks benefit most from automation. In contrast, brand-sensitive, high-stakes projects still require human oversight to preserve originality, cultural nuance, and reputational integrity.

Three competencies are central to effective collaboration: prompt engineering (enabling designers to frame and direct AI outputs), evaluative judgment (ensuring contextual accuracy and brand fit), and orchestration (sequencing tasks between humans and AI while maintaining quality). These competencies illustrate a shift from viewing designers as sole creators to seeing them as process architects who integrate computational tools with human-led creative judgment.

Several limitations must be acknowledged. The study relied on a purposive qualitative sample of 21 participants, which restricts generalizability. The geographic scope was narrow, and the cross-sectional design did not capture how competencies evolve.

Future work should build on these findings through larger and more diverse samples, quantitative measures of adoption and skill transformation, and longitudinal research to track how collaboration practices mature. Comparative studies across industries and cultural settings would also add depth, particularly in clarifying how ethical and creative norms shape sustainable human-AI collaboration. Overall, this research offers an empirical

perspective that reframes AI not as a replacement for human creativity but as a catalyst redefining designers' competencies and collaborative practices.

Future research

This study opens several avenues for further investigation. Future research could employ longitudinal designs to examine how designers' skills and attitudes evolve as AI tools mature and become embedded in everyday workflows. Quantitative or mixed-method studies could test the relationships identified here, such as the link between AI literacy, evaluative judgment, and creative performance across larger and more diverse samples. Cross-disciplinary comparisons between design, architecture, and engineering fields would also clarify whether the collaborative competencies identified in this study are universal or discipline-specific. Finally, experimental work could explore how training interventions in prompt engineering or ethical reasoning affect creative outcomes and team dynamics in human-AI collaboration.

Overall contribution

In summary, this study contributes a nuanced and empirically grounded understanding of how collaborative AI is transforming creative work into design. By reframing AI as a collaborative actor rather than a substitute for human creativity, it advances theoretical discussions on co-agency and provides actionable insights for professional practice and education. The integration of qualitative evidence, cross-role perspectives, and literature-grounded analysis ensures both academic rigour and real-world relevance. Collectively, the revisions have strengthened the paper's coherence, depth, and significance within the emerging discourse on human-AI collaboration.

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