Divergent and Convergent Thinking in AI-Driven Creativity: Ethical Implications for the Creative Design Industries

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INTRODUCTION

AI-driven creativity extends beyond algorithmic generation, relying on human input, intuition, emotion, and contextual understanding. While AI can produce novel outputs, meaningful creativity emerges through human–AI interaction, particularly in design, where cultural meaning, emotional expression, and user experience remain central.

RESEARCH PERSPECTIVE
RESEARCH SIGNIFICANCE

Understanding AI creativity requires examining:

1. **Divergent & Convergent Thinking**
2. **Human-AI co-creativity**
3. **Creative processes**
4. **Ethical implications**

RESEARCH AIM AND OBJECTIVES

This study aims to investigate how **AI influences divergent and convergent thinking in graphic design**, and how different aims to:

Compare creative performance across tlevels of AI involvement affect creative performance and human–AI collaboration. The study specifically hree conditions: **without AI, AI alone, and human–AI collaboration**.

Examine **divergent and convergent thinking** within structured graphic design tasks.

Evaluate task-specific performance through **originality, fluency, flexibility, elaboration, pseudocreativity, accuracy, rule adherence, design quality, and time efficiency**.

Examine how AI influences designers' **creative decision-making, problem-solving, and engagement**.

Explore designers' perceptions of AI collaboration, including its effects on **creative freedom, cognitive effort, efficiency, and design outcomes**.



- **(RQ 1)** How does the interaction between divergent and convergent thinking influence creative performance in graphic design tasks, in relation to time efficiency, originality, accuracy, and pseudocreativity?
- **(RQ 2)** How do participants behave in applied design tasks when collaborating with AI?
- **It is hypothesised** that AI alone leads to less original, useful ideas and its outputs can be characterised as a kind of pseudocreativity.

RESEARCH
RESEARCH QUESTIONS

METHODOLOGY

This study adopts a **mixed-methods explanatory experimental design** to examine how AI influences creative thinking in graphic design. Quantitative data will first measure creative performance, including originality, accuracy, time efficiency, and pseudocreativity, followed by qualitative data to explain participants' experiences and perceptions of AI-assisted creativity.

A minimum of 10 professional graphic designers will complete structured tasks under three conditions: (1) without AI, (2) AI alone, and (3) human–AI collaboration. Divergent thinking will be assessed through idea-generation tasks, while convergent thinking will be examined through design evaluation, refinement, and selection tasks.

To address **RQ1**, the study compares divergent and convergent creative performance across the three conditions. To address **RQ2**, questionnaires and semi-structured interviews with at least 5 participants will explore designers' behaviour, decision-making, cognitive effort, creative freedom, and perceptions of AI collaboration.

By integrating quantitative performance measures with qualitative insights, the study provides a comprehensive understanding of how AI affects creative processes and human–AI collaboration in graphic design.



METHODOLOGY
CONCEPTUAL FRAMEWORK

- **Human Creativity**
  - Divergent Thinking
  - Convergent Thinking
- **AI Creativity**
  - Pattern Recognition
  - Generative Outputs
- **Human–AI Collaboration**
  - Human judgement
  - AI-assisted creativity
- **Expected outcome**
  - Enhanced Creative Performance through Human-AI Collaboration

METHODOLOGY
RESEARCH/ EXPERIMENTAL DESIGN

Mixed-Methods Experimental Design	Quantitative and qualitative data integration
Controlled experimental approach	Measures actual AI impact on Creative Performance Beyond self-reported perceptions
Three experimental conditions	without AI, AI alone, with AI
Repeated-measures design	Same participants across all conditions controls individual differences
Research objective	Compare the effects of AI on the creative process and creative Performance

CONCLUSION

AI can enhance creative exploration, efficiency, and idea generation, but human creativity remains central to interpretation, emotional meaning, contextual understanding, and creative judgement. Human–AI collaboration therefore offers significant potential for graphic design when human agency remains central.

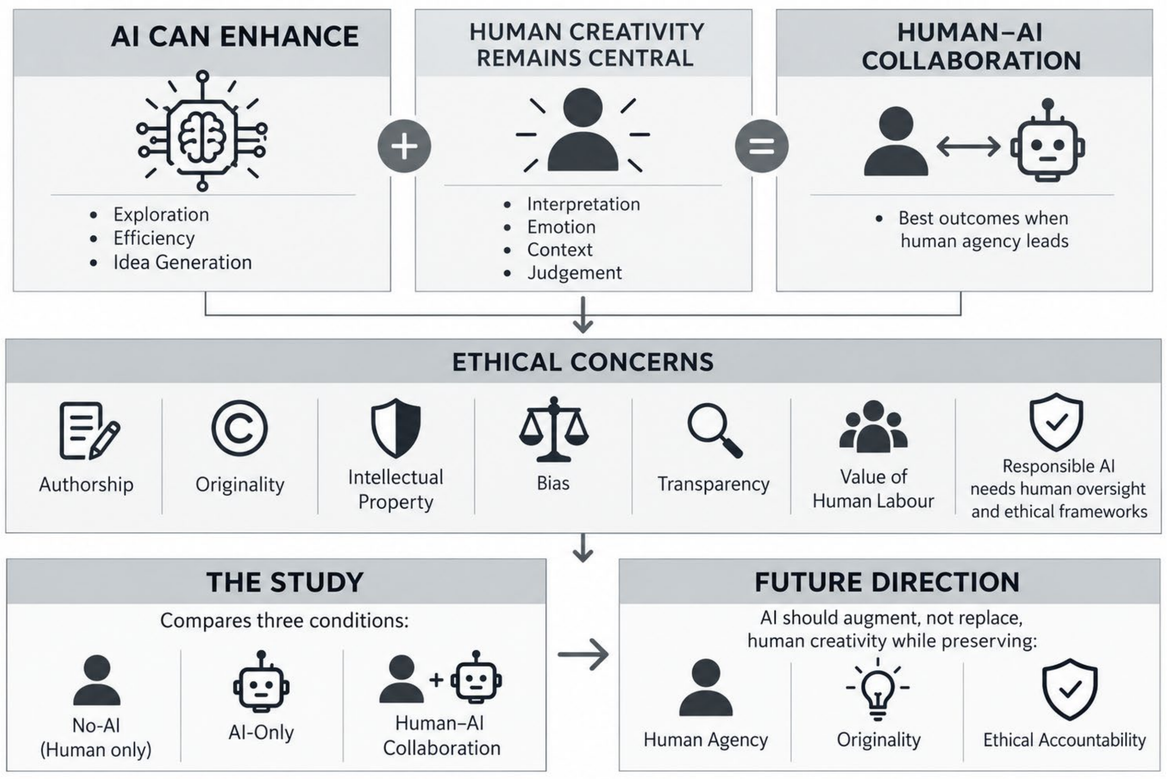
However, AI-driven creativity raises important ethical concerns, including authorship, originality, intellectual property, bias, transparency, and the value of human creative labour. Responsible AI integration requires appropriate human oversight and ethical frameworks.

The proposed research is expected to contribute by:

- Developing a **new conceptual framework** for Human-AI Creativity
- Extending the concept of **Pseudocreativity** in AI-assisted Graphic Design
- Providing **empirical evidence** through an experimental study in Graphic Design
- Contributing to **Creativity Theory and Human-Computer Interaction (HCI) research**



CONCLUSION
EXPECTED ORIGINAL CONTRIBUTION TO KNOWLEDGE



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