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Constructing a Human–AI Collaborative Design Thinking Framework for Craft Product Design

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Abstract

The rapid development of artificial intelligence (AI) is reshaping contemporary design practice. However, existing studies primarily focus on the application of individual AI tools and lack a human–AI collaborative perspective for systematically integrating AI into the craft product design process. This study aims to identify and synthesize AI intervention methods and application cases in craft product design and to construct a human–AI collaborative design thinking framework for craft product design. Employing literature analysis, this study analyzes and synthesizes 80 previous studies on AI-assisted design, craft practice, and product design methodologies to identify research gaps and establish a theoretical framework for integrating AI into the craft product design process.

The findings indicate that current AI applications in craft design are concentrated mainly on concept generation, visual ideation, and design exploration, whereas a process-oriented framework for human–AI collaboration remains insufficient. Accordingly, this study constructs a human–AI collaborative design thinking framework in which AI functions as a tool for divergent thinking to facilitate idea generation, creative exploration, and design exploration, while designers retain responsibility for convergent thinking, contextual interpretation, and final decision-making. The proposed framework provides a theoretical foundation for subsequent empirical studies and expert evaluation, while offering theoretical support and design guidelines for integrating AI into craft product development, craft education, and design education.

Keywords: Artificial Intelligence, Craft Design, Design Education, Design Methodology, Human–AI Collaboration