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Post-phenomenology of Human-AI Collaboration in Instructional Design

Hamid Ahmadi-Hedayat[1], Behnam Rasouli[2]

1. Assistant Professor, Department of Educational Sciences, Farhangian University, Tehran, Iran.
2. Assistant Professor, Department of Educational Sciences, Farhangian University, Tehran, Iran.

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Corresponding Author:
Hamid Ahmadi-Hedayat

Email:
h.hedayat@cfu.ac.ir

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Abstract

Artificial intelligence (AI) is rapidly transforming instructional design, yet limited attention has been paid to the philosophical nature of human–AI collaboration. Drawing upon post-phenomenology, this study explored the mediating relationships between humans and AI across core instructional design components. An exploratory multi-method qualitative design was employed, comprising three phases: a systematic review of 20 relevant studies from six academic databases, a structured survey of 20 experts in educational technology and philosophy of education using a 14-item checklist, and AI-assisted thematic analysis. The findings reveal that AI enhances needs assessment, content development, learner interaction, feedback, and evaluation. Furthermore, three primary post-phenomenological modes of mediation—embodiment, hermeneutic, and alterity relations—were identified as shaping educational experiences and decision-making. These results suggest that AI functions not merely as a tool, but as an epistemic partner that transforms the dynamics between learners, teachers, and knowledge. Instructional designers must integrate AI strategically while balancing pedagogical, ethical, and philosophical considerations. This study provides a conceptual framework for human–AI collaboration in post-digital education.

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Extended Abstract

Introduction

Artificial intelligence has become one of the most influential technologies shaping contemporary education. Beyond automating instructional tasks, AI increasingly participates in knowledge production, instructional decision-making, adaptive learning, and personalized educational experiences. Consequently, instructional design is undergoing a profound transformation in which human expertise and artificial intelligence collaborate throughout the design process. Most previous research has emphasized the technological effectiveness of AI in education, whereas relatively few studies have investigated the philosophical implications of this collaboration. Post-phenomenology provides a valuable theoretical perspective because it explains how technologies mediate human experiences rather than functioning as neutral tools. From this perspective, AI actively shapes educational practices, instructional decisions, and learning experiences. Accordingly, this study sought to investigate human–AI collaboration in instructional design through a post-phenomenological lens and to identify the ways in which AI influences the major components of instructional design.

Method

This study employed an exploratory multi-method qualitative research design integrating literature synthesis, expert consultation, and AI-assisted analysis. The first phase involved a systematic review of six international academic databases. Following predefined inclusion and exclusion criteria, twenty studies relevant to artificial intelligence, instructional design, and post-phenomenology were selected for detailed analysis. The second phase consisted of an expert survey involving twenty specialists in educational technology and philosophy of education. Participants completed a structured checklist containing fourteen items covering the principal components of instructional design, including needs analysis, instructional content, interaction, feedback, and evaluation. Their judgments provided additional evidence for validating and expanding the conceptual findings derived from the literature. In the third phase, multiple artificial intelligence tools were employed to facilitate literature exploration, information organization, and conceptual comparison. The collected evidence from all three phases was integrated and analyzed through thematic analysis. Codes were generated inductively and subsequently organized into higher-order themes that described the mediating role of AI across instructional design processes.

Results

The thematic analysis identified several interrelated dimensions illustrating the contribution of artificial intelligence to instructional design. Needs Analysis Artificial intelligence enhances the identification of learners' characteristics, educational requirements, learning preferences, and instructional needs through continuous data analysis and adaptive profiling. Content Development AI facilitates the generation, organization, personalization, and continuous revision of instructional content according to learners' individual characteristics and educational objectives. Interaction The findings indicate that AI substantially improves interactions among learners, instructors, digital environments, and educational resources by providing adaptive communication and intelligent support. Feedback Artificial intelligence enables immediate, individualized, and continuous feedback that improves learning performance, supports self-regulated learning, and assists instructional decision-making. Evaluation AI contributes to formative and summative assessment through learning analytics, automated evaluation, predictive analysis, and continuous monitoring of learner progress. Post-Phenomenological Human–AI Relations Three principal forms of technological mediation emerged from the

analysis. Embodiment relations describe situations in which AI becomes integrated into instructional activities as an extension of human capabilities. Hermeneutic relations demonstrate how AI interprets educational information and supports instructional understanding through intelligent analysis. Alterity relations represent interactions in which AI functions as an active educational partner capable of dialogue, recommendation, and collaborative problem-solving within instructional environments.

Discussion and Conclusion

The findings demonstrate that artificial intelligence should not be understood merely as a technological instrument supporting instructional design. Rather, AI functions as an active mediating technology that reshapes how instructional designers perceive learners, construct educational content, facilitate interactions, provide feedback, and evaluate learning outcomes. From a post-phenomenological perspective, the relationship between humans and AI is fundamentally relational rather than deterministic. Educational experiences emerge through continuous interaction among designers, learners, technologies, and instructional contexts. Consequently, effective instructional design in the post-digital era requires recognizing AI as an epistemic collaborator capable of extending human cognition while preserving the central role of human judgment and pedagogical responsibility. The study further emphasizes that successful integration of AI requires careful consideration of ethical issues, transparency, learner autonomy, data governance, and educational equity. These dimensions should accompany technological innovation to ensure responsible implementation within educational environments. Overall, this research contributes both theoretically and practically by integrating post-phenomenological philosophy with instructional design and artificial intelligence. The proposed conceptual framework provides instructional designers, educational technologists, researchers, and policymakers with a comprehensive understanding of human–AI collaboration and offers a foundation for future research on intelligent learning environments and post-digital education.

Author Contributions: Hamid Ahmadi-Hedayat was responsible for leading the overall research process, study design, data collection, and drafting the initial manuscript. Behnam Rasouli contributed to the research plan design, data collection, analysis, and interpretation. All authors have read and approved the final version of the manuscript.

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Ethical Approval: This study did not involve any clinical or medical interventions on human participants or animals. Participation of experts in the survey was voluntary, informed consent was obtained from all participants, and all procedures were conducted in accordance with general principles of research ethics.