

Advancing Pedagogical and Instructional Design through Artificial Intelligence (AI) in Education and Training Contexts

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"The only way to discover the limits of the possible is to go beyond them into the impossible. – Arthur C. Clarke

It is our pleasure and honor as guest editors for this special issue of the Journal of Applied Instructional Design (JAID) to present "Advancing Pedagogical and Instructional Design through Artificial Intelligence (AI) in Education and Training Contexts." This issue arrives at a truly timely moment, as the rapid and continuous development of generative artificial intelligence (GenAI) is fundamentally reshaping the traditional paradigms of teaching, learning, and training.

The emergence of GenAI, since the launch of OpenAI's ChatGPT in November 2022, has ignited a global conversation about its profound potential and far-reaching implications. Many researchers highlighted (Baig & Yadegaridehkordi, 2024; Crompton & Burke, 2024; Gibson, 2023; Glaser, 2023; Luo et al., 2025; Tili et al., 2023; Yang et al., 2025) the great potential of GenAI in revolutionizing the instructional design process and the educational landscape. However, its transformative power is not without its complexities or limits. The proliferation of GenAI has generated criticisms and concerns about its integration into the design, teaching, or learning processes (Baker & Hawn, 2022; Cacicio & Riggs, 2023; García-López et al., 2025; Hodges & Kirschner, 2023). Despite the growing attention, a limited body of scholarly work addresses AI practical application in the design, teaching, learning, or training processes.

The goal of this special issue is to foster critical conversations exploring the affordances, impacts, challenges, methodologies, and critical perspectives on incorporating GenAI technologies into various aspects of instructional/training design, including analysis, design, development, implementation, and evaluation of instructional or training interventions. Ultimately, this endeavor aims to optimize GenAI implementations and enhance the efficacy of teaching, training, and learning practices in GenAI-supported learning environments.

In this special issue, we are proud to feature ten insightful articles in which designers and researchers present their instructional design cases and research that utilize GenAI in various settings. Their contributions will serve as valuable resources for practitioners and researchers.

We begin by exploring the need for AI literacy and how to effectively design training and curricula to address this emerging requirement across different educational levels. Abramenska-Lachheb & Laubepin present a design case for a self-paced online

training program aimed at enhancing generative AI literacy among university faculty, staff, and students. Iqbal et al. detail the co-design of an AI literacy curriculum for elementary education through a Design Thinking approach. The design case by Ziegler et al. highlights the development of a graduate-level course for in-service P-12 teachers on Generative AI. Subsequently, we offer frameworks to guide the responsible and equitable integration of AI into instructional design practices and provide broader theoretical and ethical considerations. Williams et al. explore the implications of the GenAI Intent and Orientation Model for instructional designers and instructors. Olesova et al. propose applying Tronto's ethics of care framework to guide instructional designers in creating inclusive and accessible learning experiences when working with GenAI in higher education.

The following four articles focus on how instructional designers are actively adopting and leveraging AI tools to enhance their workflows, from specific task automation to co-creative processes and broader organizational integration. McNeil et al. investigate how instructional designers incorporate generative AI into their workflows. Lovett et al. examine an innovative nine-stage iterative process for using Large Language Models (LLMs) to generate culturally responsive learner personas for training design. Mah & Egloffstein present an innovative co-creative approach that combines generative AI with learning analytics to facilitate the development of learning materials and assessments. Bartolf et al. apply design-based research to develop and evaluate a novel curriculum builder framework powered by agentic workflows and Retrieval-Augmented Generation (RAG).

Finally, the pilot study by Alexander et al. demonstrates the application of the "Format, Language, Usability, and Fanfare (FLUF) Test" framework for critically evaluating AI-generated drug information in pharmacy education. This study helps in assessing the critical aspects of the quality, accuracy, and reliability of AI-generated content.

We hope this special issue inspires thoughtful innovation and collaborative efforts in harnessing the power of AI to advance pedagogical and instructional design for the benefit of educators and learners.

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