Integrating Artificial Intelligence in Online Teaching & Learning in Higher Education: A Systematic Literature Review

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Abstract

The integration of artificial intelligence (AI) in higher education presents a transformative opportunity for college and university faculty to enhance teaching effectiveness and student engagement. AI technologies, such as adaptive learning systems, intelligent tutoring platforms, and automated feedback tools, allow instructors to personalize learning experiences and respond more effectively to diverse student needs (Holmes et al., 2019). By analyzing learning patterns and predicting academic risk, AI tools can inform targeted interventions that improve student outcomes (Zawacki-Richter et al., 2019).

Faculty who adopt AI-supported strategies can streamline instructional tasks—such as grading, content delivery, and assessment—freeing time for more meaningful engagement with students (Luckin et al., 2016). This increased efficiency supports more active learning approaches and fosters deeper connections between students and course material. For example, generative AI can aid in designing differentiated learning activities that match students' proficiency levels, thereby enhancing both engagement and comprehension.

Moreover, research emphasizes the positive impact of AI on motivation and academic performance when used to support personalized feedback and formative assessment (Chen et al., 2020). As higher education faces growing demands for inclusivity and scalability, faculty adoption of AI represents a strategic approach to improving both pedagogy and learning equity.

This presentation examines research-based strategies for leveraging artificial intelligence (AI) to support personalized learning, enhance student engagement, and improve instructional effectiveness and efficiency in higher education. As universities navigate the evolving digital learning landscape, AI offers powerful tools to transform instructional practices and better meet the diverse needs of students. Drawing from latest research across disciplines, this session will highlight how faculty can meaningfully integrate AI into course design and delivery to create more student-centered learning environments.

The session will explore how AI-powered tools—such as adaptive learning platforms, intelligent tutoring systems, learning analytics dashboards, and generative AI—can support faculty in identifying individual learning patterns, personalizing feedback, and providing timely academic support. These technologies enable more dynamic interactions with content, facilitate formative assessment, and offer scalable solutions to enhance engagement, especially in larger classes.

Research findings shared in this presentation will focus on the impact of AI integration on student learning outcomes, motivation, and retention. In addition, the session will address the role of AI in improving instructional efficiency by automating routine tasks such as grading, content generation, and progress monitoring, allowing faculty to focus on high-impact teaching practices.

Attendees will gain practical insights into selecting and implementing AI tools that align with pedagogical goals, as well as considerations around ethics, data privacy, and faculty readiness. Finally, the presenter will conclude this interactive session by engaging participants in a Think Pair Share activity. Each participant will pair with someone to discuss a prepared scenario related to challenges in AI online or hybrid teaching and learning. The pair will discuss their scenario and suggest solutions for responsible AI integration. Pairs can volunteer to share a brief synopsis of the scenario and their solution. The scenarios encourage meaningful dialogue about the benefits, challenges, and ethical implications of using AI in online learning.