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Artificial Intelligence as a Pedagogical Partner in Higher Education: A Theoretical Review of Teaching, Learning, and Faculty Roles

ORIGINAL ARTICLE



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Abstract

Artificial intelligence (AI) is increasingly positioned not merely as an educational tool but as a pedagogical partner in higher education. From generative text systems to adaptive tutoring and automated feedback, AI is reshaping teaching practices, learning processes, and faculty roles. This paper presents a critical theoretical review of AI as a pedagogical partner, synthesizing perspectives from constructivist learning theory, sociocultural theory, human–computer interaction, and critical pedagogy. The review examines how AI influences instructional design, student cognition, teacher identity, and power relations within academic spaces. While AI promises personalized learning, efficiency, and expanded access, it also raises concerns related to pedagogical authority, deskilling of faculty, learner dependency, and epistemic justice. The paper argues that uncritical adoption of AI risks reducing

education to optimization and automation, undermining its transformative and humanistic purposes. Instead, AI should be framed as a co-educator under human oversight, embedded within ethical, reflective, and inclusive pedagogical frameworks. The paper concludes by proposing a conceptual model for responsible AI–human pedagogical partnership and outlining implications for research, teacher education, and institutional policy.

Key Words

Artificial Intelligence, Pedagogy, Higher Education, Faculty Roles, Learning Theory, Educational Ethics.

Introduction

Higher education is undergoing a profound transformation driven by advances in artificial intelligence (AI). Technologies such as intelligent tutoring systems, learning analytics, automated feedback tools, and generative AI models have moved rapidly from experimental applications to everyday academic use (Zawacki-Richter et al., 2019). Unlike earlier educational technologies that primarily supported content delivery or administration, contemporary AI systems increasingly participate in core pedagogical processes—explaining concepts, generating examples, evaluating student work, and scaffolding learning (Rudolph, Tan, & Roberts, 2023).

This shift has prompted scholars to reconceptualize AI not merely as a tool but as a *pedagogical partner* (Holmes et al., 2022). Such a framing raises important theoretical and ethical questions: What happens to teaching when machines assume instructional functions? How does AI-mediated learning align with established learning theories? What are the implications for faculty identity, professional autonomy, and academic values?

The purpose of this paper is to critically review theoretical perspectives on AI as a pedagogical partner in higher education. By integrating learning theories, sociocultural perspectives, and critical pedagogy, the paper aims to provide a nuanced understanding of AI's pedagogical role beyond techno-optimistic or alarmist narratives. The review contributes to ongoing debates by emphasizing that AI integration is fundamentally a pedagogical and ethical issue rather than a purely technical one.

Conceptualizing AI as a Pedagogical Partner

From Educational Tool to Co-Educator

Traditional educational technologies functioned as passive instruments controlled entirely by teachers. AI systems differ because they exhibit autonomy, adaptability, and generativity, enabling them to interact with learners in ways that resemble instructional dialogue (Holmes et al., 2022). For example, generative AI can explain concepts in multiple ways, simulate tutoring conversations, and respond to student queries in real time.

This shift challenges the instrumental view of technology. When AI systems guide learning paths or shape feedback, they participate in pedagogical decision-making (Zawacki-Richter et al., 2019). Theoretical analysis is therefore essential to understand how such participation aligns or conflicts with educational goals.

Learning Theories and AI-Mediated Pedagogy

Constructivist Perspectives

Constructivist theory emphasizes that learners actively construct knowledge through engagement, reflection, and problem-solving (Piaget, 1976). From this perspective, AI can support learning by providing scaffolds, prompts, and feedback that stimulate cognitive engagement.

However, concerns arise when AI provides ready-made answers, potentially short-circuiting productive struggle (Rudolph et al., 2023). If learners rely excessively on AI-generated explanations, the depth of conceptual understanding may be compromised. Thus, constructivism supports AI use only when it enhances not replaces learner agency.

Sociocultural Theory

Sociocultural theory views learning as a socially mediated process shaped by cultural tools and interactions (Vygotsky, 1978). AI can be understood as a mediational artifact that extends cognitive capacity. In this sense, AI operates within the learner's zone of proximal development by offering timely support.

Yet sociocultural theorists caution that mediation is value-laden. AI systems embed assumptions about knowledge, language, and norms, often reflecting dominant cultures (Holmes et al., 2022). Without critical oversight, AI-mediated pedagogy may marginalize diverse ways of knowing.

Human-Computer Interaction and Cognitive Load

Research in human computer interaction suggests that well-designed AI systems can reduce cognitive load and support metacognition (Sweller, 2011). Automated feedback and adaptive pacing may free cognitive resources for higher-order thinking.

Conversely, poorly designed AI interfaces can overwhelm learners or create overdependence, reducing self-regulation skills (Rudolph et al., 2023). This highlights the importance of pedagogical design rather than technological sophistication alone.

Faculty Roles in the Age of AI Redefining Teacher Identity

AI's pedagogical functions challenge traditional conceptions of teaching authority. When AI explains content or evaluates work, faculty roles shift from knowledge transmitters to learning designers, facilitators, and ethical mentors (Holmes et al., 2022).

Some scholars warn of faculty deskilling, where overreliance on AI diminishes professional expertise and autonomy (Williamson & Eynon, 2020). Others argue that AI can elevate teaching by reducing routine tasks and enabling deeper engagement with students.

Pedagogical Authority and Trust

Pedagogical authority traditionally derives from subject expertise and human judgment. AI-generated feedback may be perceived as objective or superior, potentially undermining teacher authority (Rudolph et al., 2023). This raises questions about trust: Should students trust AI explanations as much as human instruction?

From an ethical standpoint, faculty remain accountable for pedagogical decisions, even when mediated by AI. Delegation without oversight risks eroding academic responsibility.

Critical Pedagogy and Power Relations

AI, Power, and Epistemic Justice

Critical pedagogy emphasizes education as a site of power, ideology, and emancipation (Freire, 1970). AI systems are developed within corporate and geopolitical power structures, shaping whose knowledge is amplified and whose is silenced (Williamson & Eynon, 2020).

Generative AI often privileges dominant languages and epistemologies, raising concerns about epistemic injustice in global higher education. Pedagogical partnership with AI must therefore include critical interrogation of data sources, biases, and exclusions.

Neoliberalism and the Automation of Teaching

AI adoption is frequently justified through discourses of efficiency, scalability, and cost reduction. Critical scholars argue that such narratives align with neoliberal agendas that commodify education and undermine its humanistic mission (Giroux, 2014).

Framing AI as a pedagogical partner should not legitimize the replacement of educators but rather reinforce the irreplaceable relational and ethical dimensions of teaching.

Ethical Dimensions of AI–Human Pedagogical Partnership

Responsibility and Accountability

Ethical pedagogy requires clarity about responsibility. While AI may generate content or feedback, accountability for learning outcomes rests with institutions and educators (Holmes et al., 2022). Transparent communication with students about AI use is essential.

Equity and Inclusion

AI has potential to support inclusive education by assisting students with disabilities or language barriers. However, unequal access to AI tools may exacerbate digital divides (Zawacki-Richter et al., 2019). Ethical deployment must ensure equitable availability and support.

Pedagogical Transparency

Students should understand how and why AI is used in their learning. Transparency fosters trust and supports the development of critical AI literacy as an educational outcome.

Toward a Conceptual Model of AI as Pedagogical Partner

Based on the reviewed theories, this paper proposes a conceptual model characterized by four principles:

- 1. Human-in-the-loop Pedagogy:** Faculty retain oversight and decision-making authority.
- 2. Learning-centered AI use:** AI supports cognitive engagement rather than shortcutting learning.

3. **Ethical and Critical Orientation:** Power, bias, and values are explicitly addressed.
4. **Developmental Focus:** AI use contributes to students' intellectual and moral growth.

This model positions AI not as a replacement for educators but as a bounded partner within humanistic education.

Implications for Research, Policy and Practice

Implications for Research

Future studies should examine how different pedagogical designs influence student reliance on AI and learning outcomes. Qualitative research on faculty identity and agency in AI-rich environments is particularly needed.

Implications for Teacher Education

Teacher education programs must prepare faculty to critically evaluate and pedagogically integrate AI. AI literacy should be framed as an ethical and pedagogical competence, not merely a technical skill.

Implications for Institutional Policy

Institutions should develop pedagogically grounded AI policies that balance innovation with academic values. Policies should support experimentation while safeguarding equity, transparency, and professional autonomy.

Conclusion

Artificial intelligence is no longer a peripheral innovation in higher education; it has become an active participant in pedagogical processes, reshaping how knowledge is produced, mediated, and evaluated. This theoretical review has examined AI as a pedagogical partner through multiple lenses constructivist learning theory, sociocultural theory, human-computer interaction, and critical pedagogy revealing that AI's educational significance lies as much in its ethical and philosophical implications as in its technical capabilities.

The analysis demonstrates that while AI can enhance personalization, feedback, and instructional efficiency, it simultaneously challenges foundational assumptions about teaching authority, learner agency, and the humanistic purposes of education. From a constructivist perspective, AI must be carefully positioned to scaffold learning rather than replace cognitive engagement. Sociocultural theory highlights AI as a mediational tool embedded with cultural values and power relations, requiring critical scrutiny to avoid epistemic exclusion. Critical pedagogy further warns that unreflective adoption of AI risks aligning higher education with neoliberal logics of automation, efficiency, and commodification, thereby undermining its emancipatory mission.

This paper argues that the central challenge for higher education is not whether AI should be integrated, but how it should be ethically governed and pedagogically framed. Conceptualizing AI as a pedagogical partner—rather than a substitute for educators—allows institutions to harness its benefits while preserving the relational, moral, and reflective dimensions of teaching and learning. Human oversight, transparency, and accountability must remain non-negotiable principles.

Moreover, the review underscores the need to reconceptualize faculty roles in AI-enhanced environments. Educators are increasingly positioned as learning designers, ethical mentors, and critical facilitators who guide students in responsible AI use. This shift demands systematic professional development and the inclusion of AI pedagogy and ethics in teacher education programmes. Without such preparation, AI risks deepening inequalities, eroding professional autonomy, and diminishing the intellectual rigor of higher education.

In conclusion, AI should be understood as a powerful yet bounded pedagogical partner whose value depends on intentional design, ethical governance, and theoretical grounding. Future research must empirically investigate how different pedagogical models of AI integration affect learning outcomes, faculty identity, and student agency. Institutions that foreground educational values equity, integrity, critical thinking, and human development will be best positioned to navigate the AI-driven transformation of higher education responsibly and sustainably.

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