

Invited Keynote Talk

Abstract

Can AI Teach Us How to Learn? AI-Enhanced Self-Regulated Learning in the Digital Era

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This invited keynote talk explores how advances in self-regulated learning (SRL), metacognition, and AI-enabled adaptive systems are empowering learners and educators to reshape the landscape of learning in the digital era. As learners increasingly engage with immersive digital environments such as game-based simulations, human digital twins, and simulated learners new opportunities emerge to model, support, and enhance the cognitive, motivational, affective, and metacognitive processes that underlie successful learning. I will present recent developments in AI-driven adaptive learning technologies, including generative AI-powered pedagogical agents and intelligent tutoring systems that dynamically scaffold learners' planning, monitoring, strategy use, and reflection. Central to these innovations is the use of multimodal multichannel data, including eye-tracking, log files, speech, gestures, physiological indicators, and in-situ interaction traces, which enable fine-grained modeling of learners' SRL processes in real time. These data-driven insights support hybrid human-AI systems capable of delivering personalized, context-sensitive, and developmentally appropriate scaffolding across evolving digital learning environments. The talk will highlight empirical findings, methodological advances, and design implications for integrating SRL- and metacognition-centered supports into next-generation learning technologies. I conclude with a forward-looking framework outlining how adaptive AI, multimodal learning analytics, and simulated learning ecosystems can, together, foster more strategic, self-regulated, and resilient learners prepared to meet complex challenges in the digital age.