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Advancing Retention and Recollection in The Era of Generative Artificial Intelligence: A Strategic Pedagogical Framework for Higher Education

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Abstract

Generative artificial intelligence (GenAI) is rapidly transforming higher education by reshaping teaching, learning and assessment practices. While AI-powered technologies provide significant opportunities to personalise learning, improve accessibility and enhance academic productivity, they also raise important pedagogical concerns regarding declining cognitive effort, increasing dependence on intelligent systems and the potential erosion of long-term knowledge retention and independent recollection. Although recent scholarship has predominantly focused on academic integrity, ethical governance and institutional responses to AI (Cotton et al., 2023; Eaton, 2023; UNESCO, 2023), comparatively less attention has been devoted to preserving the cognitive processes that underpin meaningful learning. This conceptual paper addresses this gap by proposing the Retention–Recollection Strategic Pedagogical Framework (RRSPF), an integrated pedagogical framework that positions retention and recollection as central outcomes of AI-enhanced education. Drawing upon Cognitive Load Theory (Sweller, 1988), Retrieval Practice Theory (Roediger & Karpicke, 2006), Constructivist Learning Theory (Vygotsky, 1978), Self-Regulated Learning (Zimmerman, 2002), Metacognition (Flavell, 1979) and Cognitive Offloading Theory (Risko & Gilbert, 2016), the framework provides a strategic approach to integrating AI into higher education without diminishing the cognitive engagement required for durable learning. The paper further introduces the **Think–Retrieve–Use AI–Verify–Apply–Reflect (TRUVAR) Model**, which operationalises the framework through a structured instructional process for teaching, assessment and curriculum design. The paper contributes to the growing scholarship on AI-enhanced education by shifting attention from AI as a technological innovation to AI as a pedagogical resource that should augment, rather than replace, human cognition. The proposed framework provides a foundation for future empirical research while offering practical guidance for educators, curriculum developers and higher education institutions seeking to integrate AI responsibly into teaching and learning.

Keywords: Generative artificial intelligence; higher education; retention; recollection; retrieval practice; cognitive offloading; pedagogical innovation; AI literacy