Conceptual Article

Artificial Intelligence and the Illusion of Learning: Rethinking Knowledge Formation in Contemporary Education

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Abstract

The rapid integration of Artificial Intelligence (AI) into educational contexts has transformed teaching and learning by enhancing efficiency, personalization and access to information. However, these developments raise fundamental concerns regarding the nature and quality of learning itself. This article examines the phenomenon of the illusion of learning, wherein students demonstrate performance without corresponding understanding. Drawing on constructivist theory, cogitative psychology and recent research on AI in education, the study analyzes cognitive offloading, the erosion of student agency, the illusion of fluency and the displacement of effortful learning. At the same time, it acknowledges the pedagogical opportunities AI offers when used critically. The article concludes by proposing a disciplined critical integration of AI that preserves intellectual engagement, provokes intellectual curiosity, supports the teacher's professional judgment and sustains the formative aims of education.

Keywords: Artificial intelligence, cognitive offloading, student agency, effortful learning, educational psychology

Introduction

The growing presence of Artificial Intelligence (AI) in the educational environment marks a profound shift in the conditions under which learning occurs. AI systems now generate explanations, compose essays and solve complex problems with speed and precision that was unimaginable to earlier generations. These developments promise increased efficiency, accessibility and personalization. Yet they also raise a deeper pedagogical and psychological question, namely whether the processes through which genuine learning occurs are being gradually weakened.

Educational psychology has consistently affirmed that learning is not merely the acquisition of information but active construction of knowledge through personal engagement, reflection and cognitive effort. Piaget (1952) emphasizes that knowledge emerges through interaction with cognitive challenges, while Vygotskij (1978) explains that learning takes place within a socially mediated process. Dewey (2013) further argues that thinking is a disciplined response to uncertainty and difficulty. These perspectives converge on a central insight that learning requires effortful engagement on the part of the learner.

AI introduces a tension within this framework. By providing an immediate and often complete response, it reduces the necessity of engaging the cognitive processes that produce understanding. Students may demonstrate performance without comprehension, giving raise to what may be described as the illusion of learning. This article examines this phenomenon through the lens of cognitive psychology and recent empirical research, while also considering the opportunities AI presents when used with pedagogical discipline.

Cognitive Offloading and the Disruption of Learning Processes

The integration of AI intensifies cognitive offloading, defined as delegation of mental processing to external systems. While such delegation can enhance efficiency, it also alters the cognitive conditions necessary for learning. Research in educational psychology demonstrates that durable learning depends on processes such as retrieval practices, elaboration and problem solving, which strengthen memory and understanding (Bjork, R.A & Bjork, E.., 2019). When these processes are bypassed, knowledge remains shallow and easily forgotten.

Empirical studies support this concern. Fisher et al. (2015) show that access to external information inflates an individual's perception of their own knowledge without improving actual understanding. Ward et al. (2017) further demonstrate that the presence of digital devices reduces cognitive capacity, suggesting that external tools reshape internal cognition. In AI- supported environments these effects are magnified, as leaners increasingly offload memory and retention to external systems and become dependent on them for retrieval, a process that may hinder efficient information processing. While Jose et al. (2025) and Favero et al. (2026) both indicate that AI-supported learning can increase efficiency while weakening active cognitive engagement, retention and higher-order thinking when learnings become overly dependent on generated outputs. Qadir & Mumtaz (2026) argue that

AI supported learning may improve immediate performance while degrading independent judgment and skill formation when reliance becomes excessive.

From a psychological perspective, this trend undermines the principle of desirable difficulties, which holds that learning is strengthened when it involves effortful processing (Bjork, R.A & Bjork, E.L, 2019). Hasan (2025) deepens this argument by showing that AI disrupts the effort-reward cycle that underpins intrinsic motivation. When learners are no longer required to struggle with content, they lose both the cognitive benefits of efforts and the motivational satisfaction that accompanies mastery. Th
us, cognitive offloading through AI is not merely a shift in tools but a transformation in the nature of learning itself.

Student Agency, Self-Regulation and Cognitive Development

Student agency is central to meaningful learning. It fosters the development of independent thought, self-regulation and critical judgment. Educational psychology emphasizes that learners must actively engage in monitoring and directing their own learning processes. This aligns with theories of self-regulated learning, where learners plan, evaluate and adjust their cognitive strategies.

AI alters this dynamic by shifting the locus of cognition from the learner to the system. Empirical evidence suggests that students increasingly rely on AI-generated response without engaging in critical evaluation. Recent studies indicate that such reliance can reduce opportunities for active recall and independent problem-solving, both of which are essential for deeper learning (Jose et al., 2025). Similarly, research shows that AI-supported environments may foster dependency when learners substitute engagement with immediate output, thereby weaking reflective thinking, and intellectual autonomy (Favero et al., 2026). This growing reliance on external systems raises concerns about erosion of evaluative judgement and the diminishing capacity for independent reasoning in learners.

Hasan (2025) introduces the concept of cognitive outsourcing to describe this phenomenon, arguing that repeated reliance on AI can diminish learners' confidence in their own intellectual abilities. From a psychological standpoint this weakens self-efficacy, an important and key factor in motivation and persistence. When learners no longer see themselves as capable thinkers their engagement declines.

This has significant implications for education. Learning is not only about acquiring knowledge but also about forming the capacity to think. When AI replaces rather

than supports cognitive engagement, it risks producing learners who are efficient but not intellectually independent.

Fluency, Cognitive Load, and the Illusion of Learning

A defining feature of AI-generated content is its fluency, characterized by coherence, clarity and immediate availability. However, such fluency can create an illusion of learning. Research indicates that in the case of processing this often leads individuals to overestimate their level of learning, mistaking familiarity for mastery (Fisher et al., 2015). This tendency becomes particularly problematic in AI- mediated environments, where responses are presented in polished form without requiring visible cognitive effort from the learner.

From the perspective of cognitive load theory, learning depends on the careful balance between mental effort and processing capacity. While AI reduces cognitive load by providing ready-made answers, it may simultaneously eliminate the productive struggle necessary for meaningful learning. Carr (2010) argues that digital environments encourage shallow processing, reducing sustained attention and reflective engagement. When learners are not required to wrestle with ideas, the processes that support durable learning are weakened.

Hasan (2025) further demonstrates that AI disrupts the iterative process of darting, revising and reflecting that are central to learning. In the absence of these processes, learners may achieve surface level performance without engaging in the deeper cognitive activity required for knowledge formation. Empirical evidence likewise suggests a decline in persistence and cognitive engagement in AI -supported environments, as learners increasingly offload effort and substitute sustained intellectual activity with automated outputs (Jose et al., 2025) (Favero et al., 2026). In this sense, AI does not merely assist learning but reshapes the conditions under which learning occurs.

At the same time, it is necessary to acknowledge that AI also presents significant opportunities for education. AI can provide personalized feedback, support adaptive learning pathways, and expand access to educational resources across diverse contexts. When designed to complement rather than replace cognitive engagement, AI has the potential to enhance learning outcomes and support individualized instruction (Favero et al., 2026)(Jose et al., 2025). It can also assist teachers in managing workload and identifying learning gaps, thereby strengthening instructional effectiveness.

However, these opportunities are inseparable from corresponding challenges. Uncritical reliance on AI risks reducing cognitive engagement, weakening student agency and fostering superficial forms of learning. The central issue is therefore not whether AI should be used but how it should be integrated into educational practices in a way that preserves the integrity of learning.

The National Educational policy (Government of India, 2020) emphasizes holistic development, critical thinking and ethical reasoning as core aims of education. These aims require active participation, reflection and intellectual effort, none of which can be achieved through passive reliance on technological systems. Hasan (2025) therefore argues that AI must complement rather than replace human effort. AI generates content, but authentic learning depends on human engagement and reflection. This calls for a pedagogical approach that sustains intellectual rigor while responsibly incorporating technological tools in the service of authentic learning.

Conclusion

Artificial Intelligence presents both promise and perils for education. While it enhances efficiency and access, it also introduces the risk of an illusion of learning, where performance replaces understanding. This article has argued that uncritical reliance on AI contributes to cognitive offloading, diminishes student agency, and reduces engagement in effortful learning, thereby weakening the very processes through which meaningful learning occurs.

Education must remain oriented toward the formation of learning, judgement and intellectual virtue. Psychological principles such as desirable difficulties, retrieval practices, and intrinsic motivation remind us that learning requires effort. AI can support this process; it cannot replace it. The responsibility of educators is to ensure that technological tools serve the deeper purposes of education rather than undermining them.

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