AI IN EDUCATION: THE LINE BETWEEN STUDENT OVERRELIANCE AND INTELLECTUAL EMPOWERMENT

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Artificial intelligence tools such as ChatGPT are reshaping how students look for information and demonstrate understanding. These tools can lighten cognitive load, spark curiosity, and help students approach assignments from new angles. At the same time, these tools can pull students away from the kind of critical thinking that learning requires when used too early or too often. To clarify what meaningful engagement looks like when AI is involved, I draw on learning research such as the ICAP framework, which distinguishes interactive, constructive, active, and passive forms of thinking (Chi & Wylie, 2014). In this article, I focus on one central question: How do we tell the difference between AI that strengthens thinking and AI that gradually replaces it? Drawing on recent classroom research and my own teaching experience, I highlight where overreliance tends to emerge and how thoughtful course design can help students stay actively engaged. My goal is to offer a clear, practical view of what responsible AI use looks like in everyday learning.

Debate Over AI in Education

Debate over AI in education often swings between promise and concern. Some fear that students will lean on generative tools to such an extent that the thinking embedded in coursework becomes optional. Others see these systems as accessible learning partners that can help students test ideas, receive feedback, and strengthen early drafts. Recent reviews of generative AI in higher education show both sides of this tension: the technology can deepen understanding when used after genuine effort, yet it can also short-circuit the learning process when it supplies polished answers too quickly (Ali et al., 2024). The real issue is not whether AI helps or harms—it is **when**, **how**, and **under what conditions** it shifts from a productive scaffold into a shortcut that weakens the habits instruction is meant to build.

The Overreliance Problem

Overreliance tends to show up in recognizable ways. One early sign is a drop in genuine generative thinking. When students import AI-produced text and make only minor edits, they skip the retrieval and reasoning that support deeper learning. Another marker is miscalibration: Students often assume they understand material because the AI's fluent explanations make the work look easy. Over time, this can contribute to "concept drift," the gradual shift in a student's understanding as their mental model moves away from the intended course concepts, especially in cumulative courses where skills are meant to build from one assignment to the next. These patterns become more common when tasks are vague, when grading rewards polish over process, or when students are unsure about the boundaries of acceptable AI use. Courses that rely only on written submissions—without chances for oral explanation, problem-solving demonstrations, or iterative feedback—tend to make this drift even more likely. In one

of my courses, a student submitted a polished written response that looked impressive until we discussed it in class. When I asked her to walk through her reasoning, she froze and admitted she had relied heavily on AI to generate the explanation. The moment made clear that the "understanding" the assignment was meant to build never actually happened.

Where AI Can Empower Rather Than Replace Thinking

AI can strengthen learning when it is used in ways that keep students mentally active. It can help them compare alternative solutions, notice inconsistencies in their reasoning, or ask questions they might not have considered on their own. Research on cognitive engagement, including the ICAP framework, shows that deeper learning occurs when students move beyond passive or surface-level activity into constructive and interactive forms of thinking (Chi & Wylie, 2014). Generative AI tends to be most effective when it supports these higher levels of engagement—after students have made an honest first attempt—rather than providing polished answers too early in the process. Studies of classroom use show that when learners use AI to refine their ideas and test their understanding, the tool becomes a companion that makes thinking visible rather than a shortcut that replaces it (Mollick & Mollick, 2023). I worked with a student who attempted a complex case analysis on his own before asking AI to critique his draft. When he compared his reasoning to the model's suggestions, he spotted a weak assumption he had not noticed and revised his argument accordingly. The improvement came not from the AI's answer, but from the comparison process itself. The distinction is simple: In empowered use, AI supports the learner's reasoning. In overreliant use, AI replaces it.

Ethics, Authorship, and Disciplinary Norms

Responsible use of AI is not only a matter of learning science; it is also a matter of academic norms. Different fields draw the authorship line in different places. A philosophy course may limit AI to metacommentary and counterexample generation, while a data science course may allow AI-generated boilerplate code but reserve modeling decisions for the learner. Design programs, in particular, are experimenting with AI as a rapid prototyping partner while still requiring students to explain the aesthetic and human-centered tradeoffs behind their choices—an expectation reflected in emerging research on AI-supported creative work (Kasneci et al., 2023; Holmes et al., 2023). Across disciplines, the unifying principle is accountability: Students must own the truth and reasoning behind what they submit, even when acknowledging appropriate AI assistance. A student in my ethics course once asked whether using AI-generated code meant the assignment was technically "still his." His uncertainty showed how quickly authorship lines blur when tools produce fluent output. It turned into a discussion about intellectual ownership and what it means to stand behind the decisions in your work.

Faculty Development and Institutional Policy

Individual instructors cannot navigate the instructional, ethical, and data-related shifts introduced by AI-enabled education in isolation. As Khosravi et al. (2023) argue, the integration of AI-powered educational technologies creates system-level challenges that require coordinated institutional support rather than individual faculty-level responses. In this context, instructors need guidance, shared

examples, and time to redesign assignments so that AI use promotes active engagement rather than passive task completion. Teaching and learning centers can play a supporting role by helping translate institutional expectations into practical resources, including illustrative syllabus language, discipline-specific scenarios, and case examples that demonstrate how routine academic tasks may be restructured to support deeper learning. Institutions should also establish clear, tiered policies that distinguish prohibited uses of AI from permitted or encouraged forms of assistance. Consistent with Khosravi et al. (2023), learning analytics and AI-supported feedback systems can help identify early signs of misunderstanding or misuse, not as surveillance mechanisms but as tools for timely instructional intervention and student support, while ensuring due process in academic integrity cases that rely on probabilistic or system-generated evidence. In practice, some institutions have begun responding to these challenges by shifting toward multimodal project formats, such as image- or video-based submissions, while others employ AI-assisted pre-review systems to identify errors or inconsistencies before instructor evaluation, illustrating emerging institutional approaches to AI-supported assessment.

Conclusion

AI is neither a shortcut machine nor a silver key. It amplifies whatever learning design, assessment practice, and ethical expectations we place around it. Overreliance emerges when tasks reward polish over thought, when students turn to AI before they struggle productively, or when expectations around AI use are unclear. Empowerment grows when students are asked to compare, justify, revise, and explain their thinking—when process matters as much as product, and when access to AI is paired with transparent guidance. In my own teaching, I have watched students become more accountable when they know they will explain their work in person or on video. The line between empowerment and overuse is real, but not fixed. Educators can move it through deliberate design and honest conversation, and students can move it through reflective use. When overuse appears, it becomes a teaching moment—a chance to help students realign their habits and use AI as a tool rather than a substitute for their own intellectual work.

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