

## ASSIGNMENTS AND ACTIVITIES

# Redesigning Assignments for an AI-Influenced Classroom

By Rosie Dutt | August 11, 2025

**W**hat does it mean to succeed without learning? That is a question I have wrestled with since last spring, when students in an introductory programming course I teach submitted assignments with computer code that was unusually advanced, well-structured, efficient, and carefully annotated. But when faced with a handwritten exam asking them to explain the underlying logic, many struggled. Eventually, they admitted to relying on generative AI to complete their homework. Their honesty was refreshing, but the situation raised a pressing concern in education: When technology enables the appearance of mastery, how can we ensure that real understanding is taking place?

This isn't an isolated incident. Every year, I get a range of questions about generative AI and assignments, everything from "Can I use generative AI?" to "What percentage of my work can be AI-generated?" to "Is there an AI checker for my submission?" Each instructor will approach these questions differently, but one thing is clear: We must face these questions head-on. Yet only 39 percent of institutions now report having formal AI-related acceptable use policies in place, which is up from just 23 percent the year before, and only 9 percent believe their cybersecurity (GovTech, 2025; Digital Education Council, 2025; Robert & McCormack, 2024).

Preparing to teach this year and beyond means preparing for this new reality. While conversations around academic integrity and detection tools continue, I have found that the more impactful shift happens at the design level. If generative AI can complete our assignments without students learning, perhaps it's not students but the assignments themselves that need to change. Rather than trying to outsmart or restrict AI use, I have focused on designing smarter assignments that encourage critical thinking, transparency, and attention to the learning methods (for example, emphasizing students' step-by-step problem-solving, reflection on their decisions, and documentation of their approach) even in an AI-influenced learning environment. even in an AI-influenced learning environment. Three practical strategies have helped reframe my approach:

1. **Make thinking visible.** In programming and writing assignments, I used to assess the final submission for being logical code, a well-argued essay, or accurate analysis. Now I ask students to demonstrate their thinking throughout the process. In coding assignments, students not only annotate their code with brief explanations of what each block does but also state why they chose a specific function and what alternatives they considered. In writing-focused courses, I have implemented “thinking memos,” where students explain how they approached the prompt, what challenges they faced, and how their ideas evolved. This process not only deters mindless AI use but also allows fosters metacognition and shifts the emphasis from outcome to process. This gives me a clearer insight into what students are actually learning and not just what they submit.
2. **Require transparent AI use.** Instead of restricting the use of generative AI for assignments, I have integrated it into the structure of assessments. Students must document how they used it and reflect on its role. In coding courses, if they have consulted generative AI to debug their code, I require them to include the prompt they used, the output they received, and a short reflection on whether and why they chose the following suggestion. This approach reframes generative AI as a tool that they can and must use ethically and critically. It also invites students to actively think about reliability, authorship, and decision-making. Interestingly, I have observed that students have become more discerning in their use of generative AI, realizing that its suggestions are not always optimal and sometimes flat-out wrong. For example, AI might confidently provide an answer like “3” when asked what  $1 + 1$  equals, clearly misunderstanding the question, and thus often requires careful revision. In many cases, the real learning happens when they evaluate the AI’s suggestions using prior knowledge and the concepts they are currently learning in the course. This process encourages deeper understanding because it requires them to actively compare, analyze, and decide whether the AI’s output is accurate or relevant: skills that reinforce comprehension and build confidence.
3. **Scaffold with stages and feedback.** Assignments that unfold over time are much harder to shortcut. In my redesigned courses, I break major projects into stages (i.e., initial proposals, drafts, peer reviews, and final submissions). For instance, in a research writing module, students first generate an outline, then a draft, and finally a reflective revision letter explaining their changes. The scaffolding builds accountability and ownership while also creating natural checkpoints for feedback. It also allows me to intervene early if students are struggling or demonstrating a heavy reliance on generative AI. Most importantly, it supports research on learning as an iterative process (Lang, 2016), helping students prioritize depth, reflection, and growth over speed and surface-level completion.

# Why redesigning assignments to encourage real learning matters in the age of AI

These pedagogical redesigns are not just practical; they're backed by growing evidence in cognitive neuroscience. In a much-discussed preprint from MIT, Kosmyna et al. (2025) explore the "cognitive debt" students accumulate when relying on AI assistants for essay writing tasks. Participants who relied solely on AI showed markedly reduced neural connectivity linked to attention, semantic processing, working memory, and executive function. The study also found that while AI-assisted students completed tasks faster, they learned less than those who didn't use AI. Essays were less original, memory retention plummeted, and students reported minimal ownership over their work. Perhaps most striking, over 83 percent of ChatGPT users were unable to accurately recall what they had written just minutes earlier. These findings reinforce why it's so important for educators to redesign assignments to resist passive completion.

By requiring visible thinking (such as annotations or process explanations), transparent reporting of generative AI use, and scaffolded feedback over multiple stages, we can counteract the effects of cognitive outsourcing. These practices can keep students actively engaged, strengthen their memory formation, and help preserve the kind of deep, internalized learning that generative AI threatens to erode. Preparing to teach in this era means preparing students to not only use generative AI tools responsibly but also remain cognitively and creatively present in their own education.

## What you can do as you prepare to teach

As you prepare for the upcoming term, take a look at one assignment you have used before and ask:

- Would this still assess learning if completed entirely with generative AI?
- Could I add a reflection, annotation, or discussion component to expose student thinking?
- How might I scaffold the assignment over multiple stages to make it more authentic and less automatable?

The presence of AI in our classrooms is no longer theoretical. But we need not panic or police every input. Instead, by making small changes, we can adapt our teaching so that learning is unmistakably part of the process, even in a world where answers are just a prompt away.

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Tags: artificial intelligence, assignment strategies, ChatGPT, course redesign, generative AI