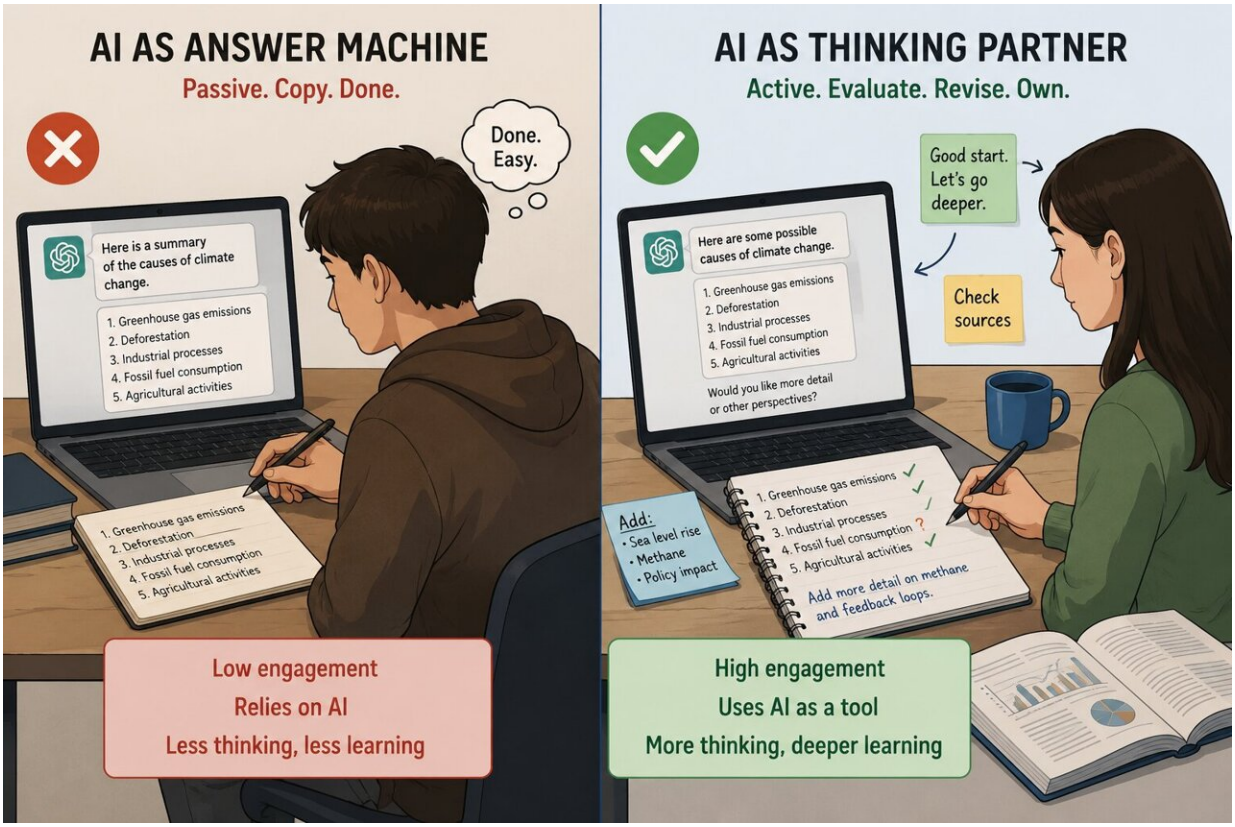
GenAI: Cognitive crutch or scaffold? Two offloading styles, two mental outcomes

July 22 2026, by Sayan Tribedi



Researchers distinguish between dependent AI use, where users rely on AI to do the thinking, and autonomous AI use, where AI serves as a starting point for deeper analysis and revision. Credit: Generated using AI

It was in the year 2022 when students and working individuals began

making use of generative AI tools such as ChatGPT for writing their essays or solving problems. The convenience of obtaining coherent text or some other solution instantly is almost magical. While this technology is certainly useful, it raises a broader issue: what will happen to our thinking? If AI does all the thinking, what will happen to our brains?

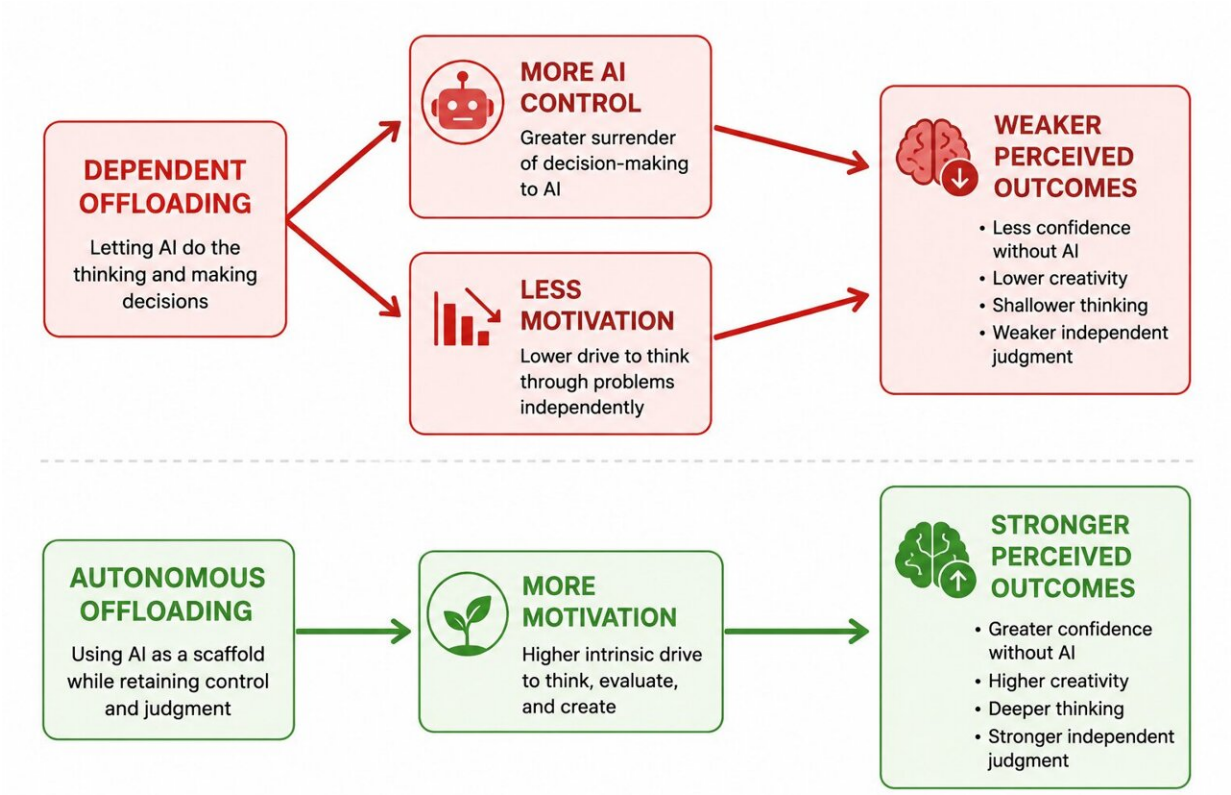
A recent study, published in the journal *Frontiers in Psychology,* finds that whether or not the effect of AI will be positive depends not on how much we use it, but rather on how we choose to engage.

In particular, the researchers noticed a definite difference between the two groups, comprising 589 college students and young professionals. While in one group, the people used AI for intellectual work, taking the results of its operations for granted and requiring minimal effort from themselves, in the other, they saw AI as a kind of brainstorming helper, using its ideas as a basis for further development of their own.

Is ChatGPT the boss or the copilot?

Does AI operate as your boss, who defines and dictates the direction and content of your work, or does it operate as a copilot that guides you through the process while leaving you in charge? And here is where this metaphor beautifully illustrates the two ways of using AI that the authors have distinguished.

The first one, referred to as dependent offloading, assumes that people outsource their cognitive functions to AI and accept its decisions as true without any analysis. Let's think of a student requesting AI to "write an essay on X" and handing in the work with almost no contribution of his own.



This flowchart illustrates the study's proposed pathways linking different styles of AI use to perceived cognitive outcomes. It contrasts dependent offloading, where users hand over more thinking and decision-making to AI, with autonomous offloading, where AI is used as a thinking aid rather than a substitute. Dependent offloading is associated with greater AI control and lower intrinsic motivation, leading to weaker perceived cognitive outcomes. In contrast, autonomous offloading is associated with higher intrinsic motivation, which is linked to stronger perceived outcomes, including greater confidence, creativity, deeper thinking, and independent judgment. Credit: adapted from the conceptual model of the study Qiuhan Zhu et al, Not all cognitive offloading is equal: distinguishing dependent and autonomous offloading to generative AI, *Frontiers in Psychology* (2026). DOI: 10.3389/fpsyg.2026.1878629

On the contrary, autonomous offloading involves the use of AI as a scaffold. In this case, people use the output produced by the AI to create

their own insight, to analyze the content, and to include it in their work. For instance, a student who uses AI to produce "five perspectives on X" and who then takes those suggestions as input for his/her own critical analysis is using AI as an assistant rather than replacing him/herself with it.

Lessons from the data

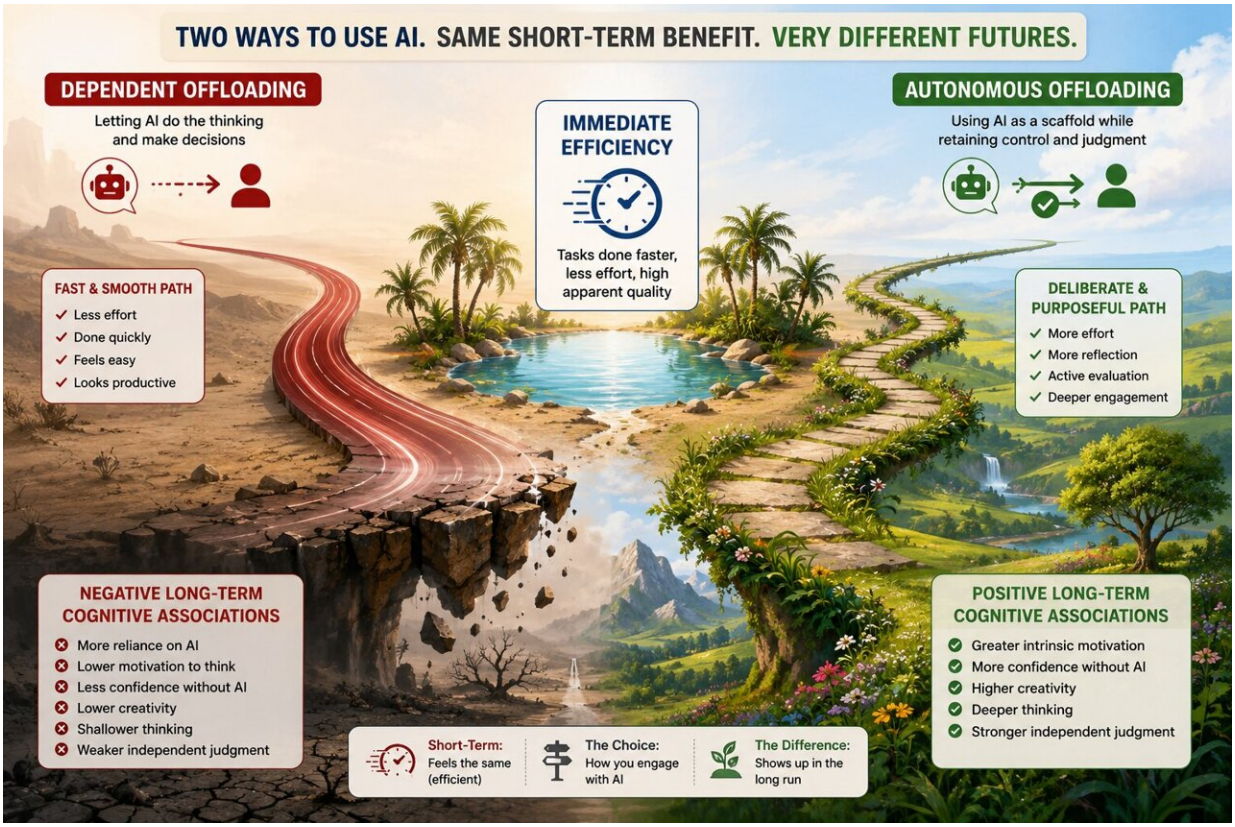
To study this, the team surveyed users who had at least a few months' experience with AI tools. In a three-part, time-lagged survey, participants first reported their AI-use style, then (two weeks later) their motivation and sense of control, and finally (another two weeks later) how creative, thoughtful, and independent they felt in their work.

The results showed a clear trade-off. Those who habitually let AI handle the answers reported less interest and more surrender of decision-making.

In their own words, this was linked to "poorer perceived outcomes" in skills like creativity and independent judgment. By contrast, students using AI autonomously felt more motivated and scored their outcomes as "more favorable." In practice, autonomous users felt they had more original ideas and a stronger sense of doing their own work.

An intriguing twist—despite the different long-term feelings, both groups said the AI answers felt equally fast and helpful in the moment. As the authors note, "both offloading modes yielded comparable immediate benefits."

Whether you use AI as a crutch or a collaborator, it can save time right away—but only one approach seems to enrich your learning later. Past studies of search engines found a similar pattern: outsourcing tasks often leaves people with shallower memory and inflated confidence.



Two ways of using generative AI that produce similar short-term benefits but diverge sharply over time. The left side depicts Dependent Offloading as a fast, effortless path leading to an oasis of Immediate Efficiency before deteriorating into a barren landscape representing Negative Long-Term Cognitive Associations. In contrast, the right side portrays Autonomous Offloading as a more deliberate path that also reaches the same efficiency oasis but continues into a lush, thriving landscape symbolizing Positive Long-Term Cognitive Associations, emphasizing how the manner of AI use—not just its immediate convenience—may shape longer-term cognitive outcomes. Credit: Generated using AI

What does this mean for learners?

As a survey study, it cannot establish cause-and-effect relationships. Additionally, the data were based on the individual's self-report, not on tests. Most participants were young Chinese students, and the tasks were quite varied.

The study results indicate that what you do with AI is more important than the amount of AI you use. ChatGPT should not be banned by educators and employers, but rather the right habits should be built. For instance, assignments can have students critique or explain an AI-generated answer, nudging students to think.

Employers should ensure the use of AI for brainstorming (the Copilot mode) and verify it themselves. Users could even be prompted by the AI applications to check their answers before accepting.

GenAI serves as an excellent support system for our thoughts; however, when considered as an answer-giving device, we may find ourselves giving away some future learning in return for convenience.

According to the authors, "The mode of AI use, not just the frequency, matters for understanding relationships with perceived cognitive function." Currently, both methods seem helpful; hence, maintaining alertness and developing good prompts or prompts-to-think will remain key.

More information: Qiuhan Zhu et al, Not all cognitive offloading is equal: distinguishing dependent and autonomous offloading to generative AI, *Frontiers in Psychology* (2026). DOI: 10.3389/fpsyg.2026.1878629

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