Will AI Tools Make Today's Students Smarter or Less Prepared in 10 Years?

Executive overview

By 2036, AI will neither universally uplift nor universally erode students' cognitive abilities; its impact will be strongly mediated by how it is used and governed. When students use generative AI as a thinking partner to construct and augment their own knowledge, studies already show higher levels of learning and stronger reasoning, whereas procedural, answer-fetching use correlates with lower-level outcomes and weaker critical-thinking scores. Given current adoption patterns and policy gaps, a bifurcation is likely: students in environments that scaffold disciplined, reflective AI use will be cognitively advantaged; those in permissive, shortcut-oriented environments will be more dependent and less prepared for complex, non-routine challenges.[1][2][3][4][5][6]

What current research says about AI and learning

A 2026 higher-education study on generative AI found that students who used GenAI tools to construct and augment knowledge (a "mastery" approach) achieved higher learning outcomes in both grades and demonstrated learning capabilities. In contrast, students who used GenAI procedurally—primarily to offload tasks without integrating or critiquing output—showed lower-level learning outcomes.[^1]

Teaching and learning resources on AI in education similarly emphasize that AI can enhance critical thinking when implemented strategically—for example, by prompting students to justify answers, compare perspectives, and expand brief AI outputs into deeper analyses. However, improper implementation that encourages dependence on AI for idea generation and explanation can undermine critical-thinking development by reducing independent analysis and reflective problem solving.[^2]

Content-analysis research on AI educational chatbots reports improved academic performance and engagement among international students when chatbots are used for academic support, suggesting that well-designed AI systems can scaffold understanding and persistence rather than simple answer copying. These findings reinforce a central theme: the cognitive impact of AI depends more on usage patterns and instructional design than on the technology itself.[7][2][^1]

Evidence on AI and critical-thinking skills

A 2025 report in a science-education context summarized research showing an inverse correlation between users' confidence in AI and their critical-thinking scores: greater confidence and reliance on AI was associated with lower critical-thinking performance, whereas higher self-confidence correlated with more critical-thinking use. Studies cited in that work found that students who frequently rely on AI tools for information retrieval and complex

reasoning tend to show lower critical-thinking scores compared with peers who engage more directly with problems.[^6]

The same discussion notes that while offloading simple calculations to tools like calculators is practical, offloading higher-order reasoning to AI risks weakening analytical skills and independent problem solving. This aligns with concerns raised by a 2026 policy report arguing that AI in children's education currently poses significant risks to cognitive development and problem-solving approaches when used without safeguards.[3][6]

On the positive side, critical-thinking guidance from university teaching centers recommends using AI to generate prompts that require step-by-step reasoning, multi-perspective analysis, and reflection on the limitations of AI summaries. These designs can preserve or even strengthen critical thinking by making AI the object of analysis rather than the unquestioned authority.[^2]

Adoption patterns and policy gaps in schools

College Board research from 2025 found that AI use for schoolwork among U.S. high-school students grew from 79% to 84% between January and May 2025, with roughly half using AI to brainstorm ideas, edit or revise essays, or conduct research. About 69% of surveyed students reported using ChatGPT for assignments and homework, making it the dominant GenAI tool in that context.[^4]

Despite high adoption, school-level policies remain fragmented: around two in five schools or districts do not allow students to use GenAI at all, roughly one in five allow use but have no policy, and smaller fractions either encourage AI use broadly or delegate policy to teachers or departments. This variability means that, over the next decade, students' AI experiences and norms will differ widely depending on local decisions rather than a coherent national strategy.[^4]

Teaching-and-integrity centers at universities emphasize that clear communication of AI policies, expectations for documentation, and explicit boundaries on what parts of work must be produced by students are critical to supporting learning while reducing academic-integrity violations. They also caution that current automatic AI-detection algorithms are unreliable and should not be used as sole evidence of misconduct, pushing institutions instead toward process-based checks such as reference verification and oral explanation of submitted work.[8][9]

Historical lessons from automation and cognitive offloading

Work on automation and skills from organizations such as the OECD shows that advances in AI and robotics can automate several high-level cognitive skills, yet high-skill occupations remain less at risk because they depend on abilities that are still hard to automate—such as complex judgment, social interaction, and creative problem framing. The study estimates that even in jobs at the highest risk of automation, only about 18–27% of required skills and abilities are highly automatable, implying that humans will still need to retain a substantial skill set even as tools take over parts of their work.[^5]

Broader analyses of past automation waves—industrial and information-technology revolutions—suggest that technologies rarely eliminate entire occupations but instead reconfigure tasks, requiring workers to retrain and shift toward complementary skills. Examples include agriculture's mechanization leading to growth in manufacturing, and ATMs changing bank tellers' roles toward relationship management rather than cash handling.[^10]

Applied to education, these precedents imply that as AI automates routine cognitive tasks (summarization, code scaffolding, basic debugging), long-term preparedness will depend on whether students develop complementary skills: problem formulation, evaluating AI outputs, integrating domain knowledge with tool suggestions, and communicating reasoning. Students who merely learn to invoke AI without these complementary skills may find themselves "automated out" of higher-order roles even if they appear productive in the short term.[5][10]

Likely bifurcation: two paths for today's students

Given current evidence and adoption patterns, a plausible forecast for 2036 is a bifurcation in student preparedness rather than a single dominant outcome.[6][1][^4]

One group—students in environments where AI use is intentionally structured—will learn to treat AI as a cognitive amplifier: they will use tools to explore alternative approaches, test hypotheses, and receive feedback, while still engaging deeply with algorithms, proofs, and problem-solving processes. These students are likely to show stronger metacognition, better prompt-engineering skills, and more robust ability to evaluate and correct AI output, leaving them well prepared for complex work that involves humans-plus-machines collaboration.[7][1] [2][5]

The other group—students whose schooling implicitly rewards AI shortcutting—may lean on AI for most non-trivial tasks: generating code, drafting essays, and solving assignments with minimal understanding. Over time, this pattern risks cognitive atrophy in critical thinking and problem-solving; such students may be less capable of handling novel, ill-posed problems that require independent structure discovery rather than pattern-matching.[3][4][^6]

Conditions under which AI will make students "smarter"

Current studies suggest that AI can enhance learning and cognitive skills when at least three conditions are met.[1][2][^7]

- **AI use is mastery-oriented rather than procedural.** Students use AI primarily to augment their own reasoning—generating alternative explanations, checking partial solutions, and identifying misconceptions—rather than to produce final answers.[2][1]
- **Assignments and assessments demand explanation and reflection.** When tasks require students to articulate their reasoning, critique AI outputs, and connect answers to underlying theory, AI becomes a tool they must interrogate rather than blindly trust.[8][2]
- **Policies and culture frame AI as a support, not a substitute.** Clear guidance that students are responsible for verifying AI output, documenting its use, and being able to orally explain their work reduces the incentive to outsource thinking.[9][8]

Under these conditions, AI can free cognitive bandwidth from routine tasks and allow more focus on conceptual understanding, complex projects, and integrative thinking. For many students, particularly those with weaker prior preparation, AI-based scaffolding and feedback can increase engagement and persistence, indirectly boosting long-term skill development.[7] [2]

Conditions under which AI will make students "dumber"

The same tools can plausibly erode preparedness when opposite conditions prevail.[3][6]

- **AI primarily replaces effort on core tasks.** If typical homework, project, and even exam tasks can be completed by pasting prompts into AI systems, students may achieve good grades without building durable mental models or problem-solving strategies.[4][6]
- **Assessment designs do not detect or discourage shortcutting.** Multiple-choice or short-answer questions that map cleanly to AI outputs, without requiring context-specific reasoning or explanation, invite students to treat AI as the primary solver.[6][3]
- **Institutional policies are vague or absent.** When schools either ban AI without enforcement or allow it without guidance, students are left to their own incentives, which often favor time-saving over deep engagement.[9][4]

Under such conditions, the long-term risk is a cohort of learners who are highly practiced at operating tools yet weak at understanding underlying mechanisms, exploring edge cases, or troubleshooting when AI fails—skills that remain critical in technical fields like computer science and engineering.[10][5]

Implications for cognitive skills 10 years out

Synthesizing these threads, the most defensible projection is that by 2036 there will be a wider spread in cognitive skills among students, driven less by innate ability and more by differences in educational ecosystems and AI practices.[5][1][^4]

Students from programs that intentionally integrate AI with rigorous, explanation-heavy curricula will likely be "smarter" in a functional sense: they will know how to collaborate with AI, debug its failures, and deploy it in complex workflows while retaining strong conceptual understanding. Students from programs that allow AI to quietly replace thinking in core tasks will likely be less prepared for novel challenges, more vulnerable to cognitive illusions of competence, and more dependent on tools that may or may not behave reliably under distribution shift.[1][2][3][5][^6]

From an instructor’s perspective, this suggests that the main lever is not whether students access AI, but whether courses and assessments are designed so that AI use must be cognitively productive rather than purely instrumental. Over the next decade, choices about assignment design, integrity policies, and expectations for oral explanation and reference verification will meaningfully shape whether AI is a net cognitive gain or loss for students.[8][9][^2]

References

1. the impact of generative AI on student learning outcomes - by JL Pallant · 2026 · Cited by 105 — Results indicate that a higher level of learning occurs when s...
2. AI and Critical Thinking in Education | Teaching and Learning - The integration of AI into educational settings is a rapidly evolving trend with significant implica...
3. The risks of AI in schools outweigh the benefits, report says - A new report warns that AI poses a serious threat to children's cognitive development and emotional ...
4. New Research: Majority of High School Students Use ... - The percentage of high school students who report using GenAI tools for schoolwork is growing, incre...
5. What skills and abilities can automation technologies ... - This paper exploits novel data on the degree of automatability of approximately 100 skills and abili...
6. To Think or Not to Think: The Impact of AI on Critical- ... - Students who frequently rely on AI tools show lower critical-thinking scores. While offloading simpl...
7. The Impact of Generative AI Educational Chatbots on ... - Generative AI educational chatbots have the potential to enhance student support, administrative eff...
8. AI & Academic Integrity | Center for Teaching Innovation - We currently do not recommend using current automatic detection algorithms for academic integrity vi...
9. Generative AI Academic Integrity Resources - Below are resources to help faculty/instructors and students understand how to properly use Generati...
10. What Past Waves of Automation Can Teach Us About AI - If history is a guide, we can expect to see a mix of job loss, creation, and modification from AI. H...