

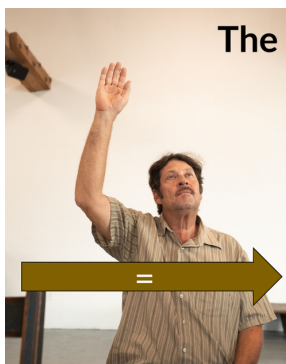
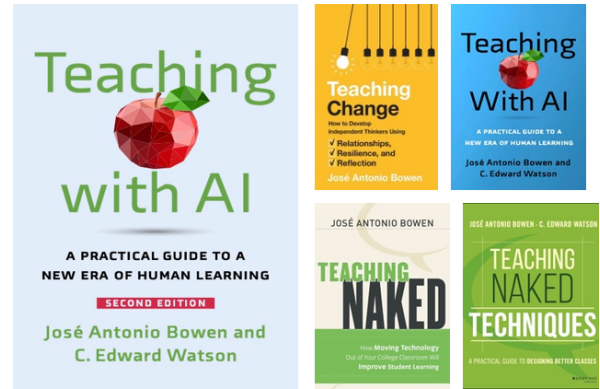
RE-DESIGNING LEARNING In the Age of AI

SLIDES & CITATIONS

José Antonio Bowen

Get the [2nd Edition of Teaching with AI](#).
Discount code HTAI25 = 30% off at JHUP.
WebSite: <https://WeTeachWithAI.com/>

► [Workshop Prompts & Materials](#)



The Usual Questions

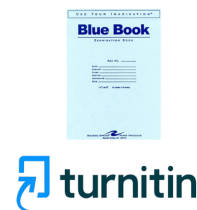
How do we stop cheating?

+ What is a good policy?

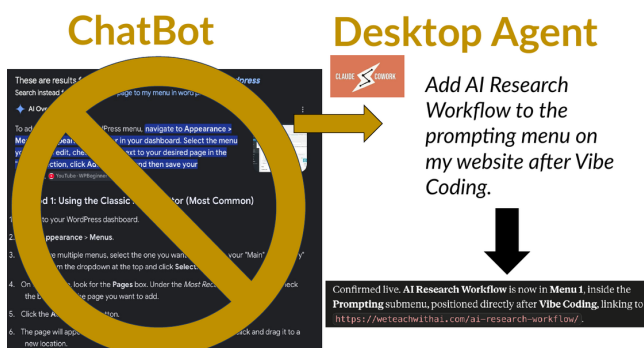
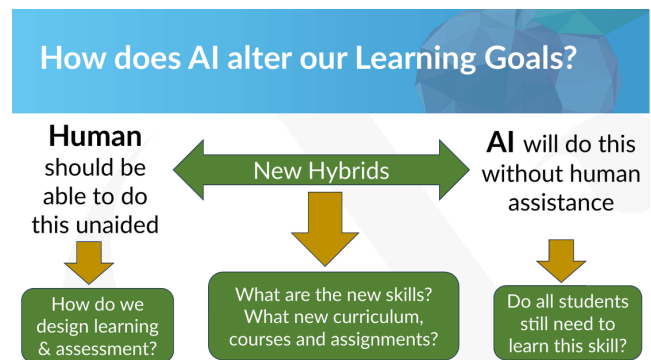
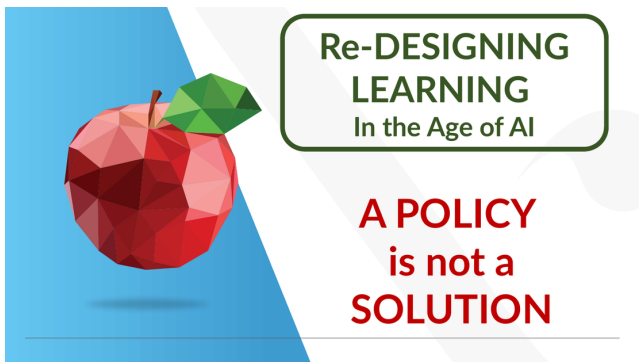
How can we deal with AI
but change as little
as possible?

Does solving the cheating problems create citizens
who only do the right thing if we are policing them?

Are we solving the wrong problem?



Curiosity
Caring
Integrity
Friction
Boredom
Cognitive Fitness



"AI has eliminated the doing and left the thinking"



- Update all links on my website (Mondays)
- Check for newer or contradictory research
- Turn ppt into pdf and add citations
- Email students who have unfinished work
- Collect all records into a database

AI doesn't reduce work, it intensifies it.

- **TASK EXPANSION**
 - You can do the work of others
- **BREAK PROMPTING**
 - Work for breaks, lunch or overnight
- **MULTITASKING & MANAGING AI**
 - Faster work pace

Ranganathan, A. & Ye, X.M. (2026, Feb 9) AI Doesn't Reduce Work—It Intensifies It. Harvard Business Review
<https://hbr.org/2026/02/ai-doesnt-reduce-work-it-intensifies-it>

DOING & THINKING

AI as the new AVERAGE

COMMUNICATION & RELATIONSHIPS

CREATIVITY

AI as LABOR

Ranganathan, A., & Ye, X. M. (2026, February 9). AI doesn't reduce work — it intensifies it. Harvard Business Review.

<https://hbr.org/2026/02/ai-doesnt-reduce-work-it-intensifies-it>

RESEARCH FINDINGS

STUDENT USE KEEPS CLIMBING

Assessment Prep

Unpacking Instructions

Lecture Follow-Ups

57% → 83%

Studying

44% → 76%

A policy is not a solution



Freeman, J. (2025). Student generative AI survey 2025 (HEPI Policy Note 61). Higher Education Policy Institute. [66% → 92% in one year] <https://www.hepi.ac.uk/reports/student-generative-ai-survey-2025/>

Marken, S. (2026, April 2). AI is routine for college students, despite campus limits. Gallup Education / Lumina Foundation—Gallup 2026 State of Higher Education study.

Parker, L., Loper, A. J., Carter, C. W., Hayes, J., & Karakas, A. (2026). Longitudinal insights into AI in education: Usage, ethics, and policy development in higher education. Computers and Education Open, 10, Article 100329.

<https://doi.org/10.1016/j.caeo.2025.100329>

College Board. (2025, May). New research: Majority of high school students use generative AI for schoolwork.

<https://newsroom.collegeboard.org/new-research-majority-high-school-students-use-generative-ai-schoolwork>

Anthropic. (2025, April 8). Anthropic education report: How university students use Claude. [vendor telemetry — measures actual use]

<https://www.anthropic.com/news/anthropic-education-report-how-university-students-use-claude>

Students THINK AI is the Most Important Skill They'll Learn in College

- **62%** see responsible AI use as essential for their future careers
- **87%** already use AI for academic purposes (5 hours/week)

Digital Education Council. (2024). Global AI student survey 2024. <https://www.digitaleducationcouncil.com/resource-library-items/digital-education-council-global-ai-student-survey-2024>

Student Voice Survey. (2026). How do you use AI? Inside Higher Ed & Generation Lab.

<https://www.insidehighered.com/news/student-success>

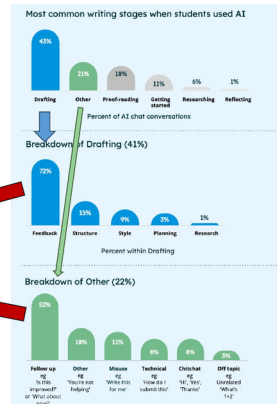
Grammarly / Talker Research survey of 2,000 U.S. college students (2025, July), reported in Newsweek. [attitude survey; industry-commissioned]

80% AI-generated text =
19.4% in US
 9.8% in UK

Most common student requests:

"Is my paper good?"
 "Am I aligned with the rubric?"
 "How can I improve?"

Turnitin Q2 2026 Learning Integrity Insights Reports



Turnitin. (2026). Q2 2026 learning integrity insights report. [vendor detection data] <https://www.turnitin.com/press/us-higher-education-students-outsourcing-writing-to-ai-at-twice-the-rate-of-uk-australian-peers>

Students want to protect learning

60% CHECKING homework

54% EDITING

49% BRAINSTORMING

The #1 Use EXPLAINING & SUMMARIZING

is a TRAP

LEARNING requires SYNTHESIS

Marken, S. (2026, April 2). AI is routine for college students, despite campus limits. Gallup Education.

Oakley, B., Johnston, M., Chen, K.-Z., Jung, E., & Sejnowski, T. J. (2025). The memory paradox: Why our brains need knowledge in an age of AI. SSRN [preprint — final venue not yet verified].

The Conversation. (2026). College students are writing with AI, but a pilot study finds they're not simply letting it write for them. [small pilot] <https://theconversation.com/college-students-are-writing-with-ai-but-a-pilot-study-finds-theyre-not-simply-letting-it-write-for-them-276856>

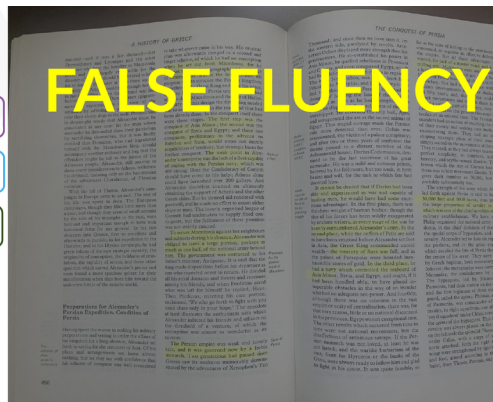
AI Synthesis

Less time engaging

Shallower knowledge

"Metacognitive Laziness"

Stadler et al. (2024)
 Melumad & Yun (2025)
 Kreijkes et al. (2025)
 Fan et al. (2025);
 Lee et al. (2025);
 Kreijkes et al. (2025);
 Kosmyrna et al. (2025, preprint);
 Gerlich (2025, corrected)



Melumad, S., & Yun, J. H. (2025). Experimental evidence of the effects of large language models versus web search on depth of learning. PNAS Nexus, 4(10), pgaf316.

<https://doi.org/10.1093/pnasnexus/pgaf316>

Stadler, M., Bannert, M., & Sailer, M. (2024). Cognitive ease at a cost: LLMs reduce mental effort but compromise depth in student scientific inquiry. Computers in Human Behavior, 160, 108386. <https://doi.org/10.1016/j.chb.2024.108386>

Kreijkes, P., et al. (2025). Effects of LLM use and note-taking on reading comprehension and memory: A randomised experiment in secondary schools. SSRN [preprint — final venue not yet verified].

Fan, Y., et al. (2025). Beware of metacognitive laziness: Effects

of generative artificial intelligence on learning motivation, processes, and performance. British Journal of Educational Technology, 56(2), 489–530. [RCT, 117 students: essay scores up, no gain in knowledge or transfer] <https://doi.org/10.1111/bjet.13544>

Lee, H.-P., et al. (2025). The impact of generative AI on critical thinking. CHI '25. [confidence in AI ↔ less critical thinking] <https://doi.org/10.1145/3706598.3713778>

Kosmyrna, N., et al. (2025). Your brain on ChatGPT: Accumulation of cognitive debt when using an AI assistant for essay writing. arXiv [preprint; small sample — cite as a cultural phenomenon, not as evidence]. <https://arxiv.org/abs/2506.08872>

Gerlich, M. (2025). AI tools in society. Societies, 15(1), 6. [self-report perception data, 666 participants; formally corrected September 2025] <https://doi.org/10.3390/soc15010006>

When students use AI without guidance

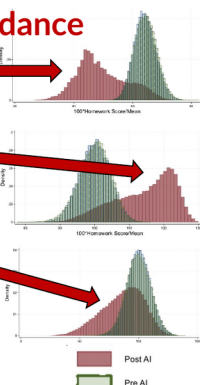
↓ 30% Time on Homework

↑ 18% Homework Grades

↓ 20% Exam Scores

Largest Learning Loss

- Social Science, STEM and Languages
- Younger, High-Achieving & Boys.
- Shorter Homework Completion Time
(26,811 Chinese Students in grades 7-12)



Strömberg, D., Lei, V., & Wu, Y. (2026). The generative AI learning penalty: Evidence from Chinese secondary education (CEPR Discussion Paper No. 21577). Centre for Economic Policy Research. [working paper]

<https://cepr.org/publications/dp21577>

Weeks, J. O., Voshaar, J., Plate, B. J., & Zimmermann, J. (2025). Generative AI usage and exam performance. ECIS 2025 Proceedings. <https://arxiv.org/abs/2404.19699>

Rismanchian, S., et al. (2026). Faster completion, less learning: Generative AI reduced study time on math problems and the knowledge they build. arXiv [preprint].

<https://arxiv.org/abs/2605.21629>

Students do not perceive the damage

+127%
practice performance WITH AI

-17%
on the exam (v. no AI control)

AI disrupts self-assessment



Bastani et al. (2025) PNAS, RCT n=1,000 · Weeks et al. (2025) Fernandes et al. (2026) Computers in Human Behavior, N=246 + replication N=452

Bastani, H., Bastani, O., Sungu, A., Ge, H., Kabakçı, Ö., & Mariman, R. (2025). Generative AI without guardrails can harm learning: Evidence from high school mathematics. PNAS, 122, e2422633122. [RCT, n ≈ 1,000]

<https://doi.org/10.1073/pnas.2422633122>

Barcaui, A. (2025). ChatGPT as a cognitive crutch: Evidence from a randomized controlled trial on knowledge retention. Social Sciences & Humanities Open, 12, 102287. [RCT, n = 120; surprise test 45 days later: 57.5% vs 68.5%, d = 0.68 — single site, note attrition]

<https://doi.org/10.1016/j.ssaho.2025.102287>

Fernandes, D., et al. (2026). AI makes you smarter but none the wiser: The disconnect between performance and

metacognition. Computers in Human Behavior, 175, 108779. [N = 246; replication N = 452; higher AI literacy predicted worse metacognitive accuracy] <https://doi.org/10.1016/j.chb.2025.108779>

Kruger, J., & Dunning, D. (1999). Unskilled and unaware of it. Journal of Personality and Social Psychology, 77(6), 1121–1134. <https://doi.org/10.1037/0022-3514.77.6.1121>

Lodge, J. M., & Loble, L. (2026). Artificial intelligence, cognitive offloading and implications for education. University of Technology Sydney. [the “performance paradox”] <https://doi.org/10.71741/4pyxmbnjq.31302475.v2>

AI TOOLS that MAKE STUDENTS DO THE WORK

Step-by-step Guidance

Answers Withheld

Mastery Pacing

Hallucination & Expertise
Guardrails

Prompts that Push



More Engagement
More Learning
Less Time

Kestin et al. (2025); Deng et al. (2024); Chung et al. (2026); De Simone et al. (2025) World Bank; Bastani et al. (2025)

Kestin, G., Miller, K., Klales, A., Milbourne, T., & Ponti, G. (2025). AI tutoring outperforms in-class active learning. Scientific Reports, 15, 17458. [Harvard RCT, N = 194]

<https://doi.org/10.1038/s41598-025-97652-6>

Deng, R., Jiang, M., Yu, X., Lu, Y., & Liu, S. (2024). Does ChatGPT enhance student learning? A systematic review and meta-analysis of experimental studies. Computers & Education, 227, 105224. [69 studies; higher-order gains largely from subjective student reports]

<https://doi.org/10.1016/j.compedu.2024.105224>

Chung, A. T.-H., Zhang, B., Kung, L.-C., Bastani, H., & Bastani, O. (2026). Effective personalized AI tutors via LLM-guided reinforcement learning. SSRN [working paper; +0.15 SD

unassisted exam gain ≈ 6–9 months of schooling] https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6423358

De Simone, M. E., et al. (2025). From chalkboards to chatbots: Evaluating the impact of generative AI on learning outcomes in Nigeria. World Bank [working paper; 800 students; girls gained most] <http://documents.worldbank.org/curated/en/099548105192529324>

Kulik, J. A., & Fletcher, J. D. (2016). Effectiveness of intelligent tutoring systems: A meta-analytic review. Review of Educational Research, 86(1), 42–78. <https://doi.org/10.3102/0034654315581420>

VanLehn, K. (2011). The relative effectiveness of human tutoring, intelligent tutoring systems, and other tutoring systems. Educational Psychologist, 46(4), 197–221. <https://doi.org/10.1080/00461520.2011.611369>



The Design is the Intervention, not the tool

WeTeachWithAI.com

1. Students SAY they use AI carefully and for learning, but
2. Explaining (the top use) reduces the friction of synthesis, so
3. When use is unguided, homework improves, exam scores fall.
4. AI disrupts self-assessment: students overestimate learning.
5. AI tools that withhold answers have produced learning gains.
6. AI can support focus by reducing extraneous cognitive load.

effect of ChatGPT on students' learning performance. [preprint reanalysis behind the retraction]

https://doi.org/10.31234/osf.io/8vs32_v1

LIMITS. The strongest evidence of harm comes from secondary students outside the United States (China, Turkey, Germany, the U.K.); the strongest evidence of benefit comes from elite, high-structure settings such as Harvard. The typical university classroom sits in the understudied middle, where age, selectivity and design are confounded. Most of these studies measure exam scores; we still lack long-term evidence about durable, transferable learning.

► <https://weteachwithai.com/designing-learning-with-ai/>

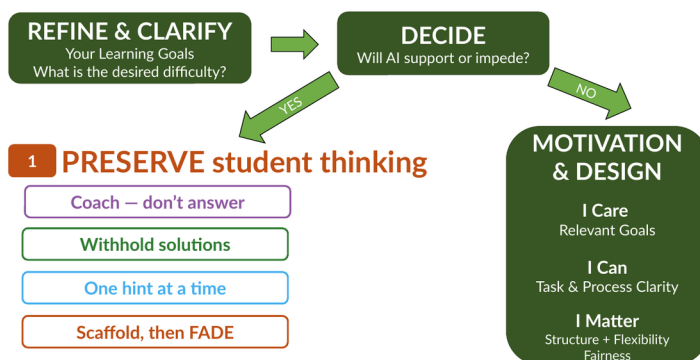
Li, C., Cui, H., & Hagedorn, L. S. (2026). The cognitive impact of ChatGPT in higher education: A systematic review of critical and creative thinking outcomes. *Computers and Education: Artificial Intelligence*, 10, Article 100571. [PRISMA review of 67 empirical studies, 2022–2025 — the strongest synthesis to date] <https://doi.org/10.1016/j.caeai.2026.100571>

Wang, J., & Fan, W. (2025). RETRACTED (22 April 2026): The effect of ChatGPT on students' learning performance... *Humanities and Social Sciences Communications*, 12, 621. [RETRACTED — never cite as evidence]

<https://doi.org/10.1057/s41599-025-04787-y>

Bartoš, F., Martinková, P., & Wagenmakers, E. (2025, May 12). Adjusting for publication bias reveals no evidence for the

DESIGN PRINCIPLES



Bowen, J. A. (2021). *Teaching change: How to develop independent thinkers using relationships, resilience, and reflection*. Johns Hopkins University Press. [I care / I can / I matter]

Biggs, J. (1996). Enhancing teaching through constructive alignment. *Higher Education*, 32(3), 347–364.

<https://doi.org/10.1007/BF00138871>

Kestin, G., et al. (2025). AI tutoring outperforms in-class active learning. *Scientific Reports*, 15, 17458.

<https://doi.org/10.1038/s41598-025-97652-6>

Chung, A. T.-H., et al. (2026). Effective personalized AI tutors via LLM-guided reinforcement learning. SSRN [working paper].

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6423358

CUSTOM BOTS = HIDDEN PROMPT + KNOWLEDGE BASE (slide 23)

A custom bot is just two things: a hidden system prompt that fixes the behavior (coach, don't answer; one hint at a time; never give the solution) and a knowledge base that fixes the content.

All of the custom tools and simulations in this session were stress-tested on the best models but set to run and interact with students using only free models.

► [Examples, templates and instructions for building simulations and custom bots](#)



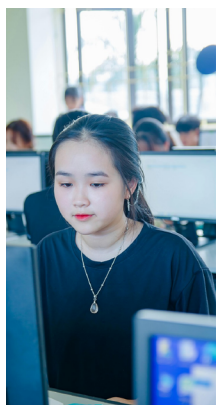
<https://doi.org/10.1038/s41562-024-02024-1>

Sweller, J., van Merriënboer, J. J. G., & Paas, F. (2019). Cognitive architecture and instructional design: 20 years later. Educational Psychology Review, 31(2), 261–292. <https://doi.org/10.1007/s10648-019-09465-5>



Example Assignment

► [What the studies say about how AI affects thinking \(overview\)](#)



AI and The Brain Meta-Analysis

Unregulated AI replaces cognitive work and harms learning.

AI designed for teaching can scaffold & improve learning.

The same AI interaction can create empowerment or dependency depending on HOW you think about it

Nasr, N. R., Tu, C.-H., Werner, J., Bauer, T., Yen, C.-J., & Sujo-Montes, L. (2025). Exploring the impact of generative AI ChatGPT on critical thinking in higher education: Passive AI-directed use or active user-directed use. Education Sciences, 15(9), 1198. <https://doi.org/10.3390/educsci15091198>

Edwards, H., & Edwards, D. (2025). How we think and live with AI: Early patterns of human adaptation. Artificiality Journal. <https://journal.artificialityinstitute.org/how-we-think-and-live-with-ai-early-patterns-of-human-adaptation/>

Zhai, C., Wibowo, S., & Li, L. D. (2024). The effects of over-reliance on AI dialogue systems on students' cognitive abilities: A systematic review. Smart Learning Environments, 11(1), 28. <https://doi.org/10.1186/s40561-024-00316-7>



Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. Harvard University Press.

Csikszentmihalyi, M. (1990). Flow: The psychology of optimal experience. Harper & Row.

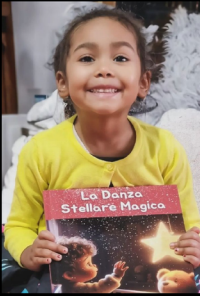
Bjork, E. L., & Bjork, R. A. (2011). Making things hard on yourself, but in a good way: Creating desirable difficulties to enhance learning. In Psychology and the Real World (2nd ed., pp. 59–68). Worth.

de Bruin, A. B. H., et al. (2023). Worth the effort: The Start and Stick to Desirable Difficulties (S2D2) framework. Educational Psychology Review, 35(2), 41. <https://doi.org/10.1007/s10648-023-09766-w>

GENERIC or CUSTOMIZED?



Touchnote



Scarlett Panda

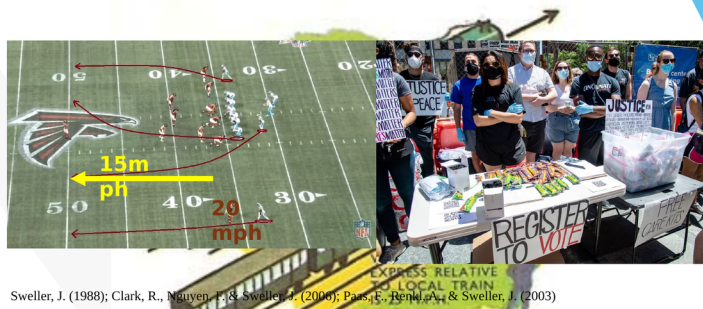
Greeting Cards
Bedtime Stories
Birthday Songs

Treatment Plans
Instructions
Textbooks
Assignments
Exams



- ▶ [Touchnote](#)
- ▶ [Scarlett Panda](#)

Increase Relevance & Customization



Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science*, 12(2), 257–285. https://doi.org/10.1207/s15516709cog1202_4

Clark, R., Nguyen, F., & Sweller, J. (2006). Efficiency in learning: Evidence-based guidelines to manage cognitive load. Pfeiffer.

Paas, F., Renkl, A., & Sweller, J. (2003). Cognitive load theory and instructional design: Recent developments. *Educational Psychologist*, 38(1), 1–4. https://doi.org/10.1207/S15326985EP3801_1

YOU TRY: Customized Assignment Prompt (slide 30)

Create 10 innovative ways to customize this assignment for every student to increase student motivation and relevance while also increasing the right kind of friction to make thinking and process visible.

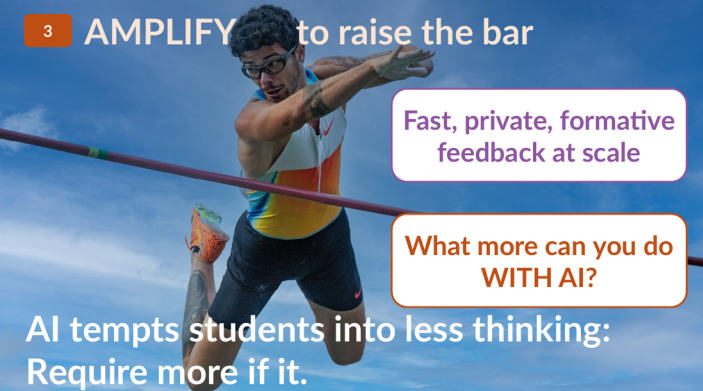
- ▶ **Assignment Rebuilder Bot (by Susan Ray)**
- ▶ [Assignment Rebuilder \(Susan Ray\) — ChatGPT version](#)
- ▶ [Assignment Rebuilder \(Susan Ray\) — BoodleBox version](#)

3 AMPLIFY to raise the bar

Fast, private, formative feedback at scale

What more can you do WITH AI?

AI tempts students into less thinking: Require more if it.



Meyer, J., Jansen, T., Schiller, R., Liebenow, L., Steinbach, M., Horbach, A., & Fleckenstein, J. (2023). Using LLMs to bring evidence-based feedback into the classroom: AI-generated feedback increases secondary students' text revision, motivation, and positive emotions. *Computers and Education: Artificial Intelligence*. <https://doi.org/10.1016/j.caeai.2023.100199>

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, 77(1), 81–112. <https://doi.org/10.3102/003465430298487>

AI as Idea Generator



Spicy Mango Jerky
Matcha Green Tea Popcorn
Gluten-Free Brazilian Cheese Bread Mix
Hibiscus Ginger Lemonade
Rose Petal Jam

- Iterate & Improve
- Cost & Price
- Packaging & Size
- Market Test
- Supply Chain & Margin
- Propose the Best 10



Urban, M., Děchtěrenko, F., Lukavský, J., Hein, V., Švácha, F., Brom, C., & Urban, K. (2023). ChatGPT improves creative problem-solving performance in university students: An experimental study. [preprint]
<https://doi.org/10.31234/osf.io/9z2tc>

Slide 33: VIDEO

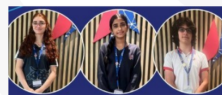
- ▶ Video embedded in this slide (YouTube): <https://www.youtube.com/watch?v=odtw7E1KPMY>

STUDENT ASSIGNMENTS

AI can do (some) things humans can't

PathoScan Screens for Colorectal Cancer

- Trained on US public gut microbiome data to find anomalies.
- Looks for bacterial imbalances and biomarkers associated with early-stage colon cancer.



Dubai American Academy ISTE AI Challenge Winners

Example: Student Assignment

- ▶ [ISTE AI Innovator Challenge winners](#)

“Pre-Read” Tools for Journal and Conferences

- [Refine.ink](#)
- [Paperreview.ai](#)

- ▶ [Refine.ink](#)
- ▶ [Paperreview.ai](#)

Reimers, I., & Wadfogel, J. (2026). AI and the quantity and quality of creative products: Have LLMs boosted creation of valuable books? NBER Working Paper 34777. [working paper]

<https://doi.org/10.3386/w34777>

Chakrabarty, T., Liu, X., et al. (2026, July). Generative AI floods and dilutes the market for books. arXiv [preprint].

<https://arxiv.org/pdf/2607.20349>

The fanfiction and roleplay line comes from the WildChat corpus: in more than 500,000 consented, English-language ChatGPT conversations, over a third involve generating fiction, especially fanfiction and erotica which generate what the authors call a "solipsistic reader-writer," "who both generates and consumes fiction within a closed conversational loop."

Gupta, N., Antoniak, M., & Walsh, M. (2026, June 23). AI fiction in the wild. arXiv [preprint; provisionally forthcoming in MFS: Modern Fiction Studies]. <https://arxiv.org/abs/2606.22748>

Zhao, W., Ren, X., Hessel, J., Cardie, C., Choi, Y., & Deng, Y. (2024). WildChat: 1M ChatGPT interaction logs in the wild. ICLR 2024. [consented corpus of 1M conversations; the dataset behind Gupta et al.] <https://arxiv.org/abs/2405.01470>



<https://doi.org/10.3389/feduc.2025.1697554>

Roediger, H. L., & Karpicke, J. D. (2006). Test-enhanced learning. *Psychological Science*, 17(3), 249–255. <https://doi.org/10.1111/j.1467-9280.2006.01693.x>

Make Thinking Visible

Fewer Artifacts - More Process & Judgement

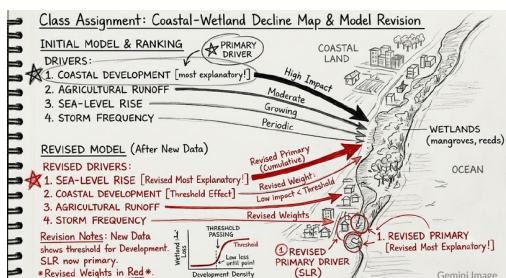
- Pre-Game** [PRIORITIZE - ANALYZE - RANK - CLARIFY
DECIDE - CHOOSE
- Draft** [WRITE - DEFEND - JUSTIFY - RECOMMEND - EXPLAIN
-- AI or no AI
- Feedback** [READ - DEBATE - DISCUSS - ENCOUNTER - COMPARE
--New evidence, conditions, cases, priorities, perspectives (from AI?)
- After Party** [REVISE - RESPOND - REFLECT
--COMMENT in your original doc (!) what you now
--STRENGTHEN, REMOVE, CHANGE, REFRAME, RESHAPE



Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In *Handbook of Self-Regulation* (pp. 13–39). Academic Press.

Bjork, R. A. (1994). Memory and metamemory considerations in the training of human beings. In *Metacognition: Knowing about Knowing* (pp. 185–205). MIT Press.

This framework is heavily influenced by a new book: Sanford, D. R. (2027, forthcoming). *Artificial intelligence, authentic voices: AI & assignment design for critical thinking in higher education*. Bloomsbury.



Daniel R. Sanford, Director, CTL, Boise State University
Artificial Intelligence, Authentic Voices: AI & Assignment Design for Critical Thinking in Higher Education (2027) Bloomsbury



This Coastal Wetlands example is from his new book. You can learn more at his website. Dan is the Director of the CTL at Boise State University.

► [Daniel R. Sanford — Artificial Intelligence, Authentic Voices](#)

BUILD a map with causal arrows explaining coastal-wetland decline
RANK all four drivers by how much explanatory work each does
MARK the driver you judge most explanatory.
CONSIDER (one week later) more data on the same region.
ADD new drivers and revise the weights on your original map. Use a new color.

Teach Students How to Use the Bot!

45% understanding fundamental concepts and jargon
42% practice questions
“I’m terrible at prompting,
so I don’t think I’m getting much out of it”

HALF never logged on

Sax, M (2025) Harvard Business School Course Tutor Bot 930 First-year accounting students
Robinson et al. (2026) Annenberg/Stanford: 2 RCTs, 355 elementary students

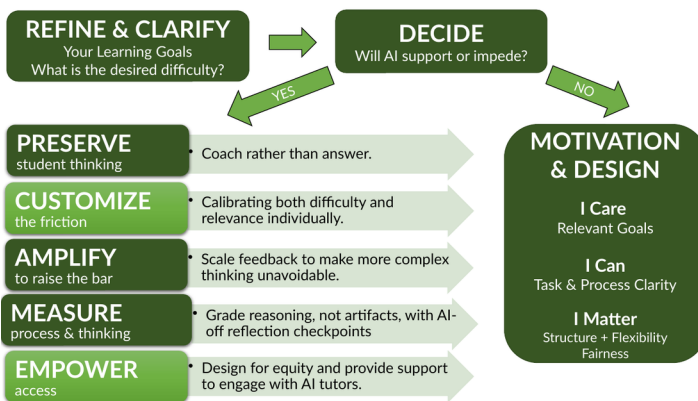
Sax, M. (2025, June 23). Custom AI tutor bots are transforming learning at HBS. Harvard Business Impact. [930 first-year accounting students; only 12% became power users] <https://hbsp.harvard.edu/inspiring-minds/ai-tutor-bots-harvard-business-school>

Robinson, C. D., Gormley, D., Ribeiro, A. T., & Loeb, S. (2026). Access is not enough: Human support improves engagement with AI tutoring (EdWorkingPaper No. 26-1451). Annenberg Institute, Brown University. [working paper; 2 RCTs, 355 elementary students; engagement rose 71–80% but reading achievement did not] <https://doi.org/10.26300/pz7p-p388>

Henderson, M., et al. (2025). Comparing generative AI and teacher feedback: Student perceptions of usefulness and trustworthiness. Assessment & Evaluation in Higher Education. [8,642 open-ended responses: teachers more

trusted] <https://doi.org/10.1080/02602938.2025.2502582>

Er, E., et al. (2025). Assessing student perceptions and use of instructor versus AI-generated feedback. British Journal of Educational Technology, 56(3), 1074–1091. <https://doi.org/10.1111/bjet.13558>

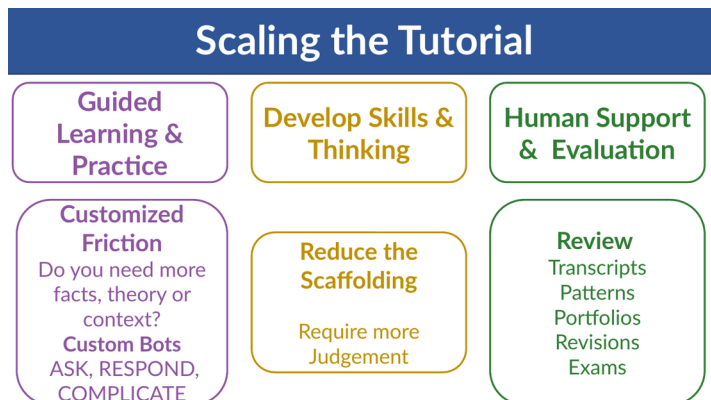


► [Full principles, templates and examples](#)

Wang, R. E., Ribeiro, A. T., Robinson, C. D., Loeb, S., & Demsky, D. (2024). Tutor CoPilot: A human-AI approach for scaling real-time expertise. arXiv [preregistered RCT: 900 tutors, 1,800 K-12 students; +4 points mastery, +9 for the lowest-rated tutors, ~\$20/tutor/year] — principle 8, EQUIP the humans. <https://arxiv.org/abs/2410.03017>

Martin, A. J., et al. (2025). Integrating generative AI and load reduction instruction. Learning and Individual Differences, 121, 102723. <https://doi.org/10.1016/j.lindif.2025.102723>

Dunn, T. L., & Risko, E. F. (2016). Toward a metacognitive account of cognitive offloading. Cognitive Science, 40(5), 1080–1127. <https://doi.org/10.1111/cogs.12273>



Bloom’s tutorial advantage was never mostly about content delivery. It was guided practice, immediate correction and a human who noticed. AI scales the first two cheaply; on the current evidence the third still has to be human, and the gains show up only when the tool withholds answers and someone reviews the process. This is the whole ReDesign argument in one frame: the six boxes are the eight principles applied to a single course.

Bloom, B. S. (1984). The 2 sigma problem: The search for methods of group instruction as effective as one-to-one tutoring. Educational Researcher, 13(6), 4–16. <https://doi.org/10.3102/0013189X013006004>

Kulik, J. A., & Fletcher, J. D. (2016). Effectiveness of intelligent tutoring systems: A meta-analytic review. Review of Educational Research, 86(1), 42–78. [the 2-sigma claim does not replicate at scale; ITS effects cluster near 0.4–0.6 SD] <https://doi.org/10.3102/0034654315581420>

Wang, R. E., Ribeiro, A. T., Robinson, C. D., Loeb, S., & Demsky, D. (2024). Tutor CoPilot: A human-AI approach for scaling real-time expertise. arXiv [preregistered RCT: 900 tutors, 1,800 K-12 students] <https://arxiv.org/abs/2410.03017>

TURN & TALK (slide 44)

What idea about AI are you now rethinking?

EXAMPLES

Fact-Checking Prompt Contest



1. Contribute one claim to our shared document.
2. Write a prompt that verifies facts and sources.
3. Test it. Improve it. Explain why (comments).
4. Test prompts in pairs.
5. Compare to Mike Caulfield's Deep Background prompt/GPT.
6. Write a critical thinking process for yourself that uses AI.
7. Reflect (bot?): why is critical "doing" also important?



- ▶ [Complete assignment](#)
- ▶ [Deep Background GPT \(fact checks and context\)](#)
- ▶ [Complete SIFT prompt](#)

Editing to Your Voice

1. What makes your writing sound like your writing?
2. What does AI writing get wrong about you?
3. Prompt AI to write like you.
4. Edit what it provides and iterate.
5. Does this make the next time easier?
6. What happens when writing becomes directing?

Curation Thinking & Meaning

Ivy Linton Stabell: [The Influence Project](#) in First-Year English

- ▶ [Ivy Linton Stabell \(Iona University\)](#)

- Pick any work of art you love.
- Look expansively for artistic ancestors.
- PROMPT: a RANGE of influences for X
- Learn about parent and grandparent works.
- Find three historical context subjects for each.
- Journal about the influences and differences.
- Lots of conferences with the professor.
- Write about this journey.

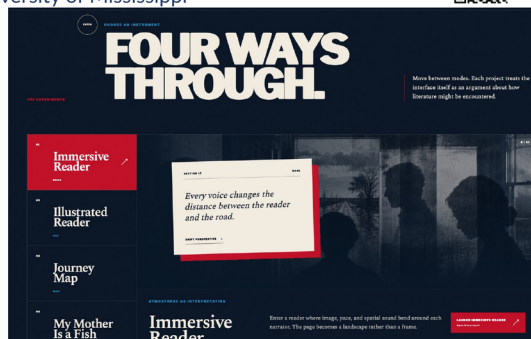
Reading Faulkner's As I Lay Dying

Marc Watkins, University of Mississippi



No embedded chatbots, Faulkner personas, automatic summaries, or buttons that tidy away the novel.

Each project is an encapsulated module designed to help students slow down, explore, annotate, and make an interpretive choice.



Reading Faulkner's As I Lay Dying

(slide 49)

Marc Watkins, University of Mississippi.

- ▶ [As I Lay Dying gallery](#)
- ▶ [Marc Watkins Substack](#)

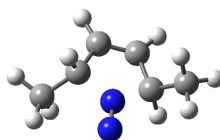
ART HISTORY FINAL: Teach an AI how to paint like John Constable. Create a new image and clarify what stylistic elements are visible.



Ira Greenburg, Director of the Center of Creative Computation and Professor of Art at SMU

VIDEO

Transform the equation and molecular structures provided into a video that demonstrates the reaction and how bonds are broken and formed.



Sora (Open AI)
Veo (Google)
pika.art (free)
heygen.com
invideo.io
synthesia.io
kapwing.com
colossyan.com

U.S. Immigration Visa Preference System

An interactive teaching tool to understand how the family and employment-based preference system works, who gets in line, and how long the wait can be — for immigrants from countries around the world.



Overview Wait times My situation Key terms Ask a question

The U.S. grants a limited number of immigrant visas each year through a **preference system**. Click any category below to learn more about it.

Immediate relatives (no annual cap)

IR Immediate relatives of U.S. citizens
Spouses, unmarried children under 21, and parents of U.S. citizens. **No annual cap** — visas are always available.
No wait (usually)

What is the estimated process and wait time for legal immigration in the following situations?

Family-based preference categories (~226,000 visas/year)

F1 Unmarried adult children of U.S. citizens
Sons and daughters age 21+. About 23,400 visas per year.
Family-based

F2A Spouses & minor children of LPRs
Spouses and children under 21 of lawful permanent residents.
~114,200 visas/yr.
Family-based

► [Immigration wait-time artifact](#)

Stress Test A Plan

Help me stress test the attached business plan by simulating how our business might evolve over the next 2 years. I will play the CEO. You will simulate and describe economic, market and political challenges that might interfere with our plan. Every quarter you will update me and ask me to respond to new events and circumstances. You will then assess my actions and describe how the plan must change as a result.



Role-Playing, Dialogues
& Text-Adventure Games

Custom Bots & Simulations

- English/Middlemarch Town Hall
- Computer Science
- Music Theory/Roman Numeral Analysis
- Telecom KPI Simulation
- Physics/Newton's Laws Graded Exam
- Anthropology/Multi-Informant Fieldwork
- Nursing/AACN Standard 2.5 Plan of Care
- History/Thomas Cromwell
- POTUS and the Economy



- [Interactive fiction and game design with Claude artifacts \(TCEA\)](#)
- [Examples and templates](#)
- [Middlemarch Tribunal simulation](#)
- [Workshop materials](#)

AI Disclosure

- Where did you use AI?
- What did you do without AI?

→

AI Literacy

- Where did AI make your work better or worse?
- What AI work did you alter?
- What would you have missed without AI?
- How did you know?

Make Thinking Visible

Pre-Game	[	PRIORITIZE - ANALYZE - RANK DECIDE - CHOOSE
Draft	[	WRITE - DEFEND
Feedback	[	NEW Something
After Party	[	REVISE - RESPOND - REFLECT --In the original document

Make Thinking the Assignment

AI Inputs

→

Convene a Meeting

Moderate a Debate

Choose a Path

Prioritize a Value

Hold a Symposium

Decide a Strategy

→

Human Outputs

Invert the usual order. Let AI produce the raw material — the brief, the data, the opposing positions — and make the human work the part that cannot be delegated: convening, weighing, choosing and defending. The gradable artifact is the judgment, not the prose.

► [Assignment examples](#)

Singh, A., Guan, Z., & Rieh, S. Y. (2025). Enhancing critical thinking in generative AI search with metacognitive prompts. *Proceedings of ASIS&T*, 62(1), 672–684.

<https://doi.org/10.1002/pr2.1287>

Vaccaro, M., Almaatouq, A., & Malone, T. W. (2024). When combinations of humans and AI are useful. *Nature Human Behaviour*, 8, 2293–2303. [106 experiments: human-AI teams did worse on decision tasks, better on creation tasks — an argument for keeping the decision human] <https://doi.org/10.1038/s41562-024-02024-1>

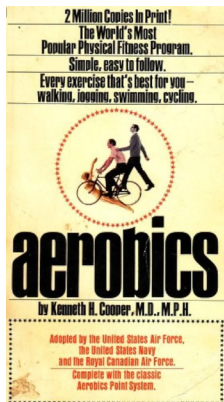
COGNITIVE FITNESS

Technology is neither good nor bad; nor is it neutral.

Melvin Kranzberg (1917-1995) Professor of History of Technology

Which tasks should you do?

Kranzberg, M. (1986). Technology and history: “Kranzberg’s laws.” *Technology and Culture*, 27(3), 544–560.

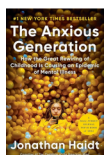


Dr. Kenneth H. Cooper
(1968)

“The Streets Are
Going to Be Full of
Dead Joggers”

Cooper, K. H. (1968). *Aerobics*. M. Evans. [the “dead joggers” line is from a review from the period, not a quotation from the book]

IS COGNITIVE FITNESS IS DECLINING?



When is AI junk food for the mind?



Bratsberg, B., & Rogeberg, O. (2018). Flynn effect and its reversal are both environmentally caused. *PNAS*, 115(26), 6674–6678. <https://doi.org/10.1073/pnas.1718793115>

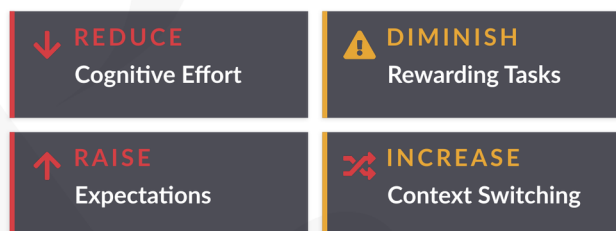
Nguyen, L., et al. (2025). Feeds, feelings, and focus: A systematic review and meta-analysis examining the cognitive and mental health correlates of short-form video use. *Psychological Bulletin*, 151(9), 1125–1146. [71 studies, 98,299 participants] <https://psycnet.apa.org/fulltext/2026-89350-001.html>

Mark, G. (2023). *Attention span*. Hanover Square Press.

Haidt, J. (2024). *The anxious generation*. Penguin Press. [contested — the causal claim is disputed by several researchers]

Healthy Minds Network. (2024). Healthy Minds Study 2023–2024 data report. <https://healthymindsnetwork.org/research/data-for-researchers>

COGNITIVE DELEGATION TO AI CAN



Lodge, J. M., & Loble, L. (2026). Artificial intelligence, cognitive offloading and implications for education. University of Technology Sydney. <https://doi.org/10.71741/4pyxmbnjq.31302475.v2>

Zhai, C., Wibowo, S., & Li, L. D. (2024). The effects of over-reliance on AI dialogue systems on students’ cognitive abilities: A systematic review. *Smart Learning Environments*, 11(1), 28. <https://doi.org/10.1186/s40561-024-00316-7>

UNDERSTANDING COGNITIVE DELEGATION
*is essential for the
 future of human cognitive fitness*

 **Which tasks
should AI do?**

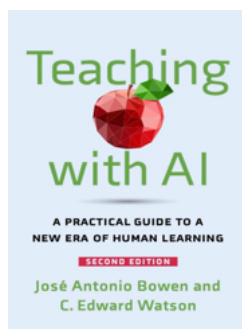
 **When should I NOT
use AI?**

 **From Professor of Content
To Cognitive Coach**

Bandura, A. (1997). Self-efficacy: The exercise of control. Freeman. [mastery experiences build self-efficacy]

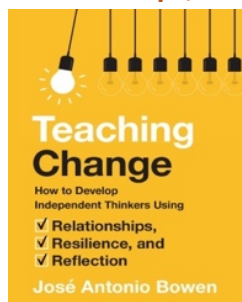
Wu, H., Ni, H., He, J., & Wee, E. H. (2026). AI anxiety and AI dependence among undergraduates: A moderated mediation model of AI self-efficacy and AI literacy. *Frontiers in Psychology*, 17, 1884382.
<https://doi.org/10.3389/fpsyg.2026.1884382>

CITATIONS & RESOURCES



- ▶ [WeTeachWithAI.com](https://www.weteachwithai.com) contains many many more resources, prompts, assignments and links. It is updated weekly if not daily.
- ▶ **Buy the book at 30% off!**
- ▶ [Teaching with AI at Johns Hopkins University Press — code HTAI25 for 30% off](#)
- ▶ [Teaching with AI on Amazon](#)

▶ If you don't want to use AI, but want students to want to do things the hard way, then read **Teaching Change: How to Develop Independent Thinkers Using Relationships, Resilience and Reflection**.



- ▶ [Teaching Change at Johns Hopkins University Press — code HTWN for 30% off](#)
- ▶ [Teaching Change on Amazon \(often 25% off\)](#)