

WORKSHOP A Part 2

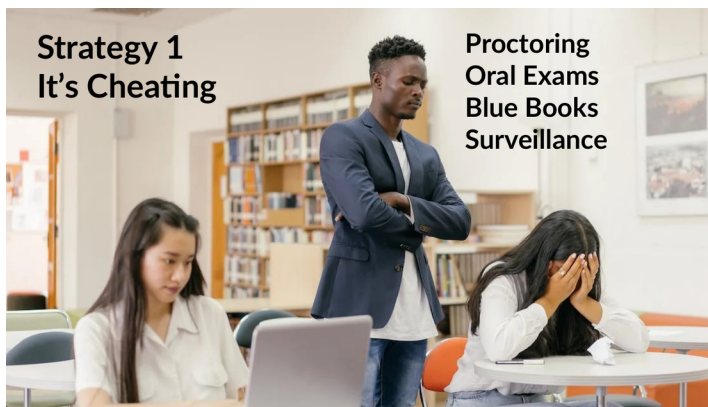
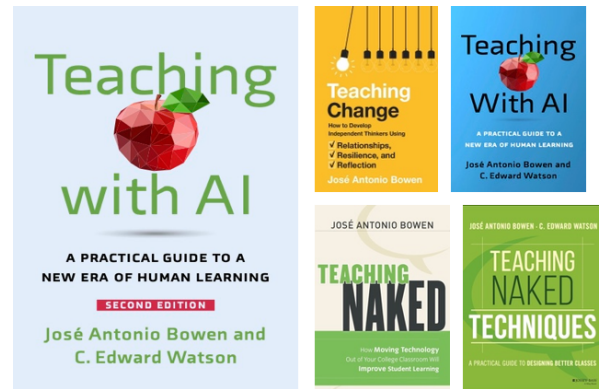
TEACHING WITH AI

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](#)



January 29, 2025



U.S. Copyright Office. (2025, January 29). Copyright and artificial intelligence, part 2: Copyrightability.
<https://www.copyright.gov/ai/> <https://www.copyright.gov/ai/>

...the outputs of generative AI can be protected by copyright only where a human author has **determined sufficient expressive elements**.

It's not Plagiarism, so what do we call this?

Cheating?	Intent to gain advantage
Overreliance?	Excessive dependance
	Undermines educational purpose
Misuse?	Inappropriate use
	Failure to disclose
Fraud?	Deliberate misrepresentation

AI Detection

- Accuracy varies considerably.
- The best are better than faculty, but do make mistakes. (Weber-Wulff et al., 2023; Perkins et al. 2023)
- *AI detectors do not accuse students of cheating.*



Weber-Wulff, D., et al. (2023). Testing of detection tools for AI-generated text. *International Journal for Educational Integrity*, 19, 26. <https://doi.org/10.1007/s40979-023-00146-z>

Perkins, M., Roe, J., Postma, D., McGaughan, J., & Hickerson, D. (2023). Detection of GPT-4 generated text in higher education: Combining academic judgement and software to identify generative AI tool misuse. *Journal of Academic Ethics*. <https://doi.org/10.1007/s10805-023-09492-6>

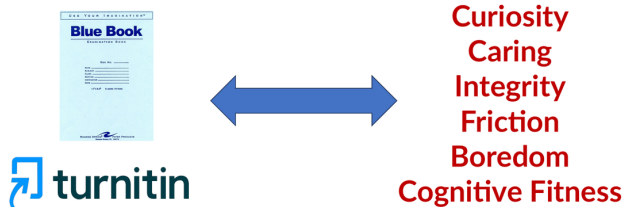


► [Interactive false-positive calculator \(the QR code on this slide\)](#)

Turnitin. (2024, April 9). Turnitin marks one year anniversary of its AI writing detector with millions of papers reviewed globally. [press release; 200M+ papers reviewed, 22M flagged with 20%+ AI content, ~880,000 potential false positives] <https://www.turnitin.co.uk/press/turnitin-first-anniversary-ai-writing-detector>

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

Are we solving the wrong problem?



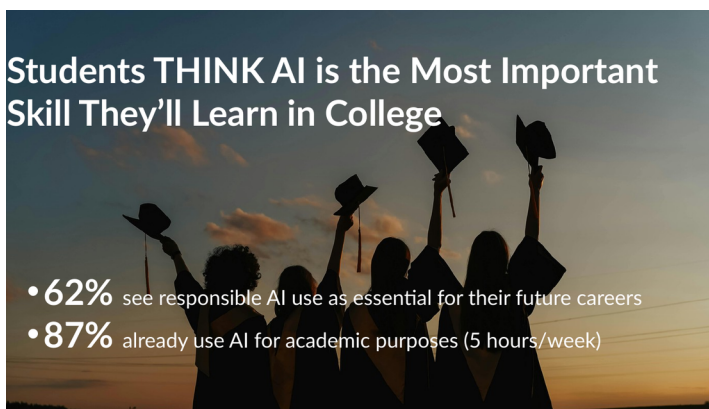
AI Is Changing
AVERAGE

**Work with AI to
RAISE STANDARDS**





Cengage Group. (2024). Graduate employability report. [974 recent graduates]
<https://cengage.widen.net/s/bmjxxjx9mm/cg-2024-employability-survey-report>
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Amazon Web Services. (2025). Accelerating AI skills in the U.S. workforce.

<https://assets.aboutamazon.com/e1/a0/17842ee148e8af9d55d10d75a213/aws-accelerating-ai-skills-us-en.pdf>

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



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?



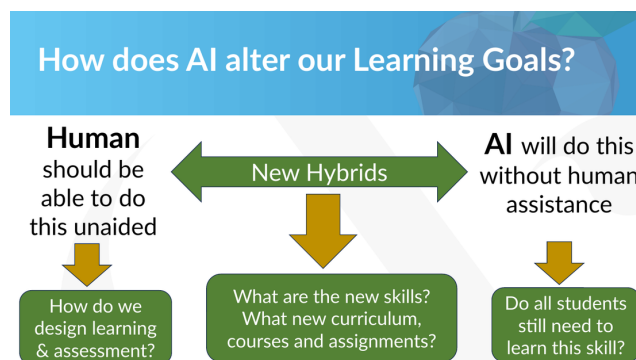
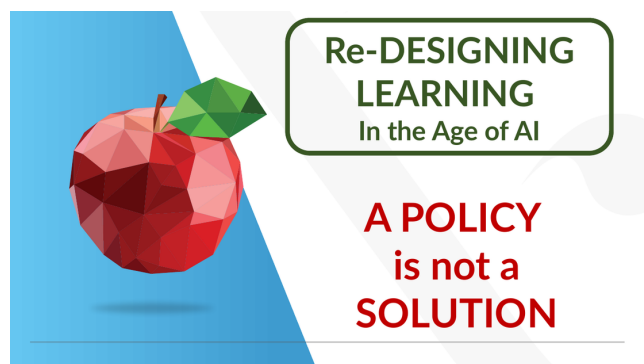
Policies, Resources and More
 WeTeachWithAI.com



► [Policies, resources and more — WeTeachWithAI.com/resources](https://www.weteachwithai.com/resources)

► [University policies on generative AI \(shared Padlet\)](#)

RE-DESIGNING LEARNING



RESEARCH FINDINGS



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/>
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<https://www.digitaleducationcouncil.com/resource-library-items/digital-education-council-global-ai-student-survey-2024>

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

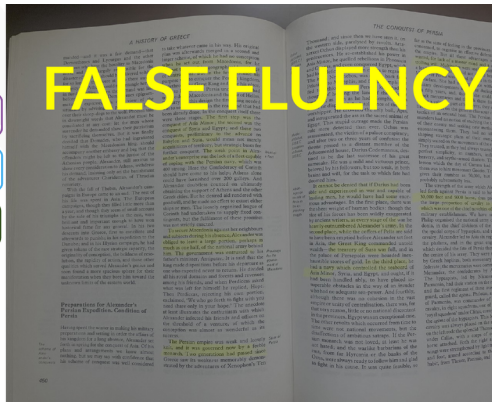
AI Synthesis

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)



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>
<https://doi.org/10.1016/j.chb.2024.108386>

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>
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<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>
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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/soc1501006>
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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].

When students use AI without guidance

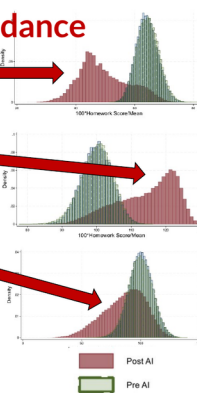
↓ 30% Time on Homework

↑ 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). [working paper; 26,811 students, grades 7–12] <https://cepr.org/publications/dp21577>
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<https://doi.org/10.1016/j.ssaho.2025.102287>

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)

The strongest evidence for benefit comes from AI tools designed to make students do the work:

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>

<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>

<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 $\approx$ 6–9 months of schooling]

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

<http://documents.worldbank.org/curated/en/099548105192529324>

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 $\approx$ 1,000] <https://doi.org/10.1073/pnas.2422633122>

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

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> <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>

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

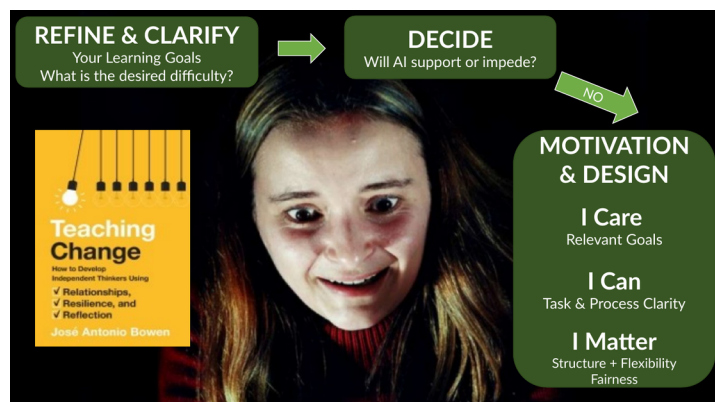
Bartoš, F., Martinková, P., & Wagenmakers, E. (2025, May 12). Adjusting for publication bias reveals no evidence for the effect of ChatGPT on students' learning performance. [preprint reanalysis behind the retraction] https://doi.org/10.31234/osf.io/8vs32_v1

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.

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

DESIGN PRINCIPLES



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

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

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

AI & MOTIVATION

When assignments
are just products,

AI is just labor.

PURPOSE **WHY?**

What skills will I gain?
How will I be able to use this?

TASK

CLARITY

What will I need to do?

HOW

Process? Mistakes to avoid?

SPACING

When and Where? One sitting?

CRITERIA **CHECKLIST**

I am on the right track?

RUBRIC

What matters most? & WHY

RELEVANCE

Examples of real-world work

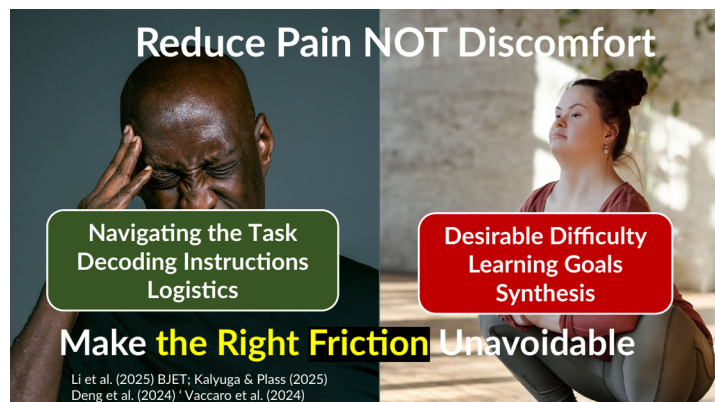
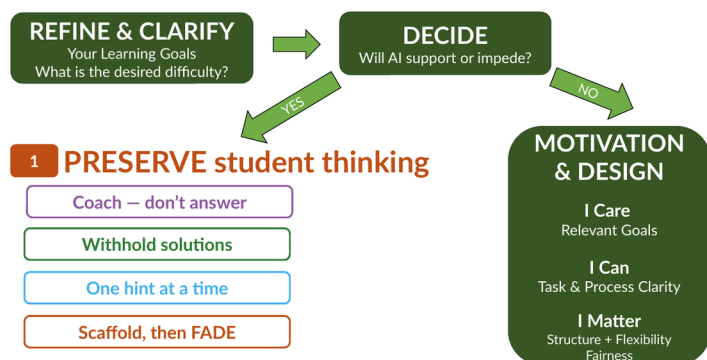
WORKSHOP: Redesign an Assignment or Course (slide 27)

Analyze this assignment and help me transform it using one or more of these pedagogical practices or thinkers...

Re-imagine my course/assignment with standards-based grading/TILT etc.

Revise this assignment to increase student motivation. Start with a rationale about why this assignment matters with relevant real-world examples...

► [Workshop Prompts & Materials](#)



Li, C.-J., Hwang, G.-J., Chang, C.-Y., & Su, H.-C. (2025). Generative AI-supported progressive prompting for professional training. *British Journal of Educational Technology*, 56(6), 2550–2572. [quasi-experimental, n = 62] <https://doi.org/10.1111/bjet.13594> <https://doi.org/10.1111/bjet.13594>

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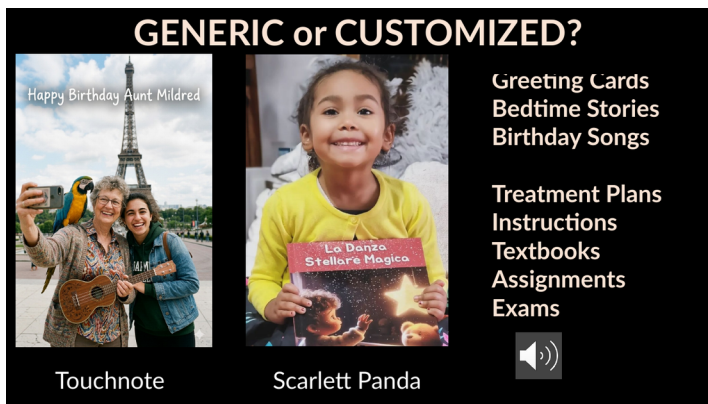
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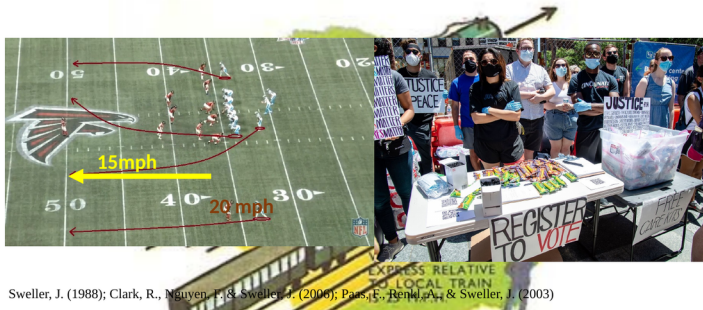
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Kapur, M. (2008). Productive failure. *Cognition and Instruction*, 26(3), 379–424. <https://doi.org/10.1080/07370000802212669>



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

Increase Relevance & Customization



Sweller, J. (1988); Clark, R., Nguyen, F., & Sweller, J. (2006); Paas, F., Renkl, A., & Sweller, J. (2003)

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CUSTOMIZED ASSIGNMENTS

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:



BoodleBox



GPT



YOU TRY: Customized Assignment Prompt (slide 33)

Complete Prompt:

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 \(Susan Ray\) — ChatGPT version](#)
- [Assignment Rebuilder \(Susan Ray\) — BooodleBox version](#)



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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



Quantity of ideas is the greatest predictor of innovative success. “In order to have good ideas, you need a lot of ideas.” — Linus Pauling

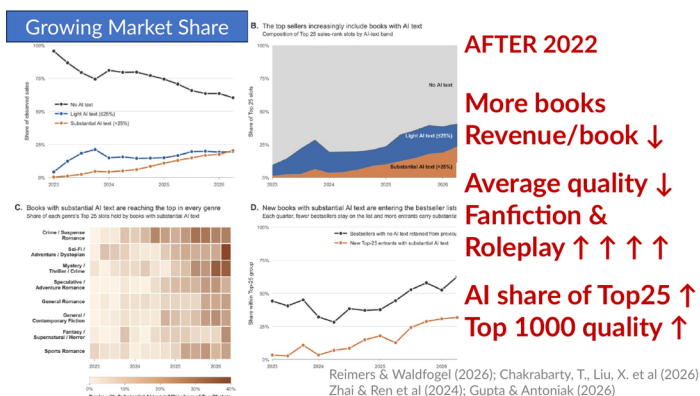
Girotra, K., Meincke, L., Terwiesch, C., & Ulrich, K. T. (2023). Ideas are dimes a dozen: LLMs for idea generation in innovation. SSRN. <https://ssrn.com/abstract=4526071>

<https://ssrn.com/abstract=4526071>

De Freitas, J., Nave, G., & Puntoni, S. (2025, December 17). When used correctly, LLMs can unlock more creative ideas. *Harvard Business Review*.

Doshi, A. R., & Hauser, O. P. (2024). Generative AI enhances individual creativity but reduces the collective diversity of

novel content. *Science Advances*, 10. <https://doi.org/10.1126/sciadv.adn5290> <https://doi.org/10.1126/sciadv.adn5290>



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.” (Note: the slide credits “Zhai & Ren”; the correct first author is Zhao.)

Reimers, I., & Waldfogel, 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> <https://doi.org/10.3386/w34777>

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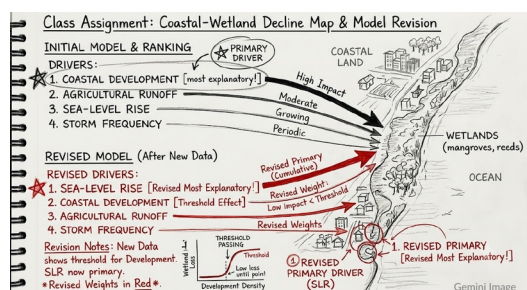
<https://doi.org/10.1016/j.learninstruc.2024.102011>

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>
<https://doi.org/10.1111/j.1467-9280.2006.01693.x>

Tomisu, H., Ueda, J., & Yamanaka, T. (2025). The cognitive mirror: A framework for AI-powered metacognition and self-regulated learning. *Frontiers in Education*, 10, 1697554. [framework paper, not empirical] <https://doi.org/10.3389/feduc.2025.1697554>
<https://doi.org/10.3389/feduc.2025.1697554>

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



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

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

This Coastal Wetlands example is from a new book that heavily influenced this framework: Sanford, D. R. (2027, forthcoming). *Artificial intelligence, authentic voices: AI & assignment design for critical thinking in higher education*. Bloomsbury. Dan is the Director of the CTL at Boise State University.

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

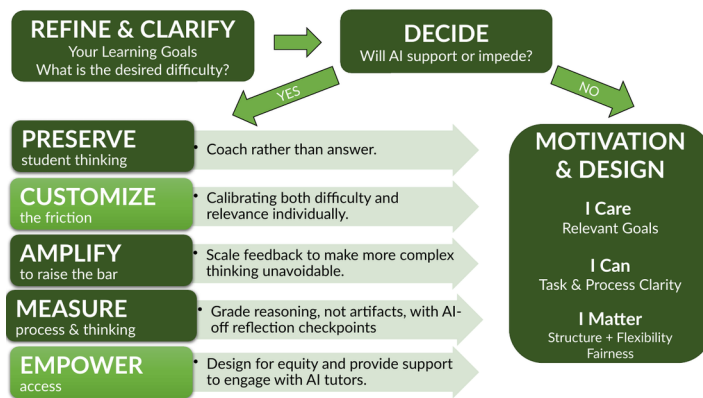
Sax, M. (2025, June 23). Custom AI tutor bots are transforming learning at HBS. Harvard Business Impact. [930 first-year accounting students; only 12% became power users] <https://hbsp.harvard.edu/inspiring-minds/ai-tutor-bots-harvard-business-school> <https://hbsp.harvard.edu/inspiring-minds/ai-tutor-bots-harvard-business-school>

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> <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> <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> <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].

<https://arxiv.org/abs/2410.03017> <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> <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> <https://doi.org/10.1111/cogs.12273>

RECONNECTING WRITING & THINKING

AI Is Separating
WRITING from **THINKING**

**How might we
reconnect them?**

Make Thinking Visible

Process Assignments

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

Revising After New Conditions

PRIORITIZE the competing aims/positions/conditions/trade-offs
CHOOSE an action/interpretation/priority/policy goal/design approach
DRAFT a recommendation (with or without AI) to
DEFEND your approach
IDENTIFY a feature that reflects your priority
NAME the limitations resulting from your choice, and
ANTICIPATE and ANSWER an objection
DESCRIBE a condition where your prioritization would change
ENCOUNTER new circumstances/evidence/conditions/case
COMMENT (in doc) where you now hesitate, change or reassess
CONNECT each to a Z principle with one sentence explanation

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

Weighting Constraints in a Case Study

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

ANALYZE this plan for a pedestrian bridge.
CLARIFY the tensions with budget, required load, extreme weather...
STATE the most significant priority and why (in one sentence).
CONNECT this priority to one condition that reflects that priority.
DRAFT a recommendation (with or without AI) to
DEFEND the feature that reflects your priority
NAME the limitations resulting from your choice, and
ANTICIPATE and ANSWER an objection from a council member
DESCRIBE one realistic condition where your prioritization would change and how that would change the design.



The worked examples on these slides (a pedestrian bridge, team decisions, accounting materiality) are from: Sanford, D. R. (2027, forthcoming). *Artificial intelligence, authentic voices: AI & assignment design for critical thinking in higher education*. Bloomsbury.

ANALYZE this problem/plan/design
IDENTIFY the specific trade-offs or tensions
AGREE on a standard for team decisions
APPLY the standard to determine an action
DRAFT a recommendation
IDENTIFY a feature that reflects your priority
NAME the limitations resulting from the choice
ANTICIPATE and ANSWER an objection
DESCRIBE what would change your priority
CONSIDER new evidence/conditions/case
REVISE your decision and explain how the team considered the new evidence against the priority.

Team Decisions



Applying Standards in Accounting

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

ANALYZE this company profile and financial statements
WRITE a materiality statement describing the threshold for when an error or omission would become a reporting issue and how confident you are in this.
EVALUATE these three reporting issues
DETERMINE where each is material, not material or requiring disclosure
JUSTIFY your decision using your threshold statement
COMPARE your decisions with the benchmark provided
IDENTIFY where you diverged from the benchmark
EXPLAIN why your confidence might have been too high or too low
EVALUATE a second set of reporting issues
DETERMINE where each is material, not material or requiring disclosure
IDENTIFY the tensions with your threshold statement across the cases and also what remained stable and most useful.



Writing Assignments

D Define the stages of the project

E Evaluate which AI for each stage
Ex. Elicit for research; Copilot for editing

E Explore how the AI might help or hurt
Get feedback on your outline.

R Reflect if AI helped/hurt writing AND learning



Cummings, R. E., Monroe, S. M., & Watkins, M. (2024). Generative AI in first-year writing: An early analysis of affordances, limitations, and a framework for the future. *Computers and Composition*, 71, Article 102827. <https://doi.org/10.1016/j.compcom.2024.102827> <https://doi.org/10.1016/j.compcom.2024.102827>

Curation, Thinking & Meaning

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

- 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.

The Influence Project, Ivy Linton Stabell (Iona University), First-Year English.

► [Ivy Linton Stabell](#)

Reverse Outlining

- Read this and create an outline summarizing the main point of each paragraph with one sentence.
- How might I more persuasively organize or focus this to say X.

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?

Journaling with a Bot

You are a kind and insightful assistant who guides students to reflect deeply and discover their own insights and passions from writing about their learning experiences.

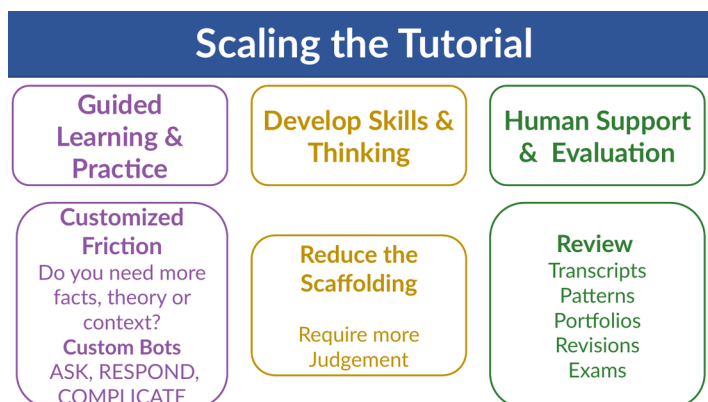
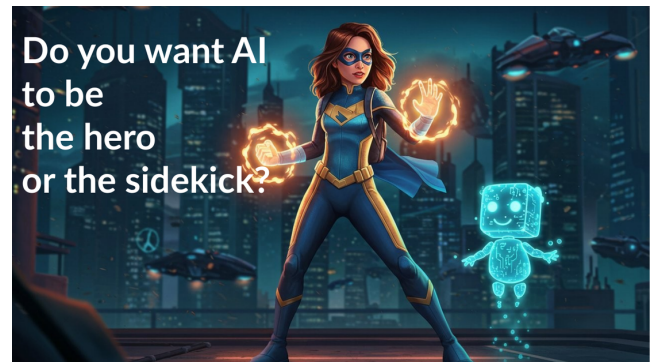
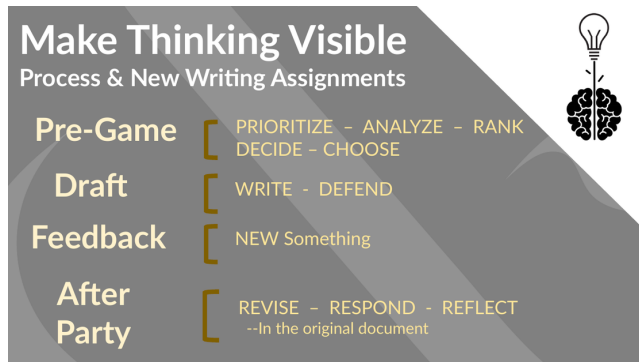
1. Ask students to reflect on something they learned in the last day and how it might have changed their thinking or perspective.
2. Consider the student's response and then ask a series of supportive and insightful follow-up questions that will stimulate reflection and self-discovery.
3. Ask the student to respond again and repeat the process.



Wikipedia Assignment

- Faculty guide students to research course-related topics and verify sources, then fill in missing information and add high-quality citations to Wikipedia articles.
- If permitted by the instructor's course policies, students can learn to use AI as a research tool to identify content gaps and references, not a text generator.
- WikiEdu offers trainings, tools to track student work, and staff support.

► [Teach with Wikipedia \(WikiEdu\)](#)



The tutorial was BOTH learning and assessment, but it could not be scaled. 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.

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> <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> <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> <https://doi.org/10.1080/00461520.2011.611369>

YOU TRY: Copy & Paste

Critical Thinking Support Prompt — or — Feynman Learning Tutor Prompt.

► [Workshop Prompts & Materials](#)

Custom Bots (Prompts) for Writing



Thesis Nuance Navigator

Deep Reading a Meaningful Quote

Eric Lars Martinsen
Ventura County Community College

Custom bots (prompts) for writing: Thesis Nuance Navigator; Deep Reading a Meaningful Quote. Eric Lars Martinsen, Ventura County Community College.

► [Playing seriously: four AI apps \(Eric Lars Martinsen, Substack\)](#)

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 \(Mike Caulfield — fact checks and context\)](#)
- ▶ [Complete SIFT prompt](#)

Multiple Perspectives Prompt

Respond as a panel of radically different types of thinkers

- with a variety of historical, cultural & political perspectives
- who ask thought-provoking questions and
- deepen my insight
- by providing simultaneous and contrasting opinions
- and feedback about this work/idea/goal/challenge.

READING: FOUR CORNERS



1. Come up with four different points of view that relate to our reading.
2. Ask an AI to provide summaries of the reading from each POV.
3. Read the summaries and read the article.
4. Create a new set of questions.
5. Write your summary.
6. Reflect and write about why your summary was different?

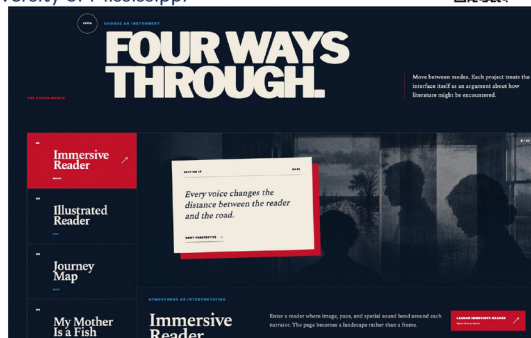
Reading Faulkner's As I Lay Dying

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 63)

Marc Watkins, University of Mississippi.

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

Prompt to Support Reading

- ▶ [Workshop Prompts & Materials](#)

CREATIVE NEW ASSIGNMENTS

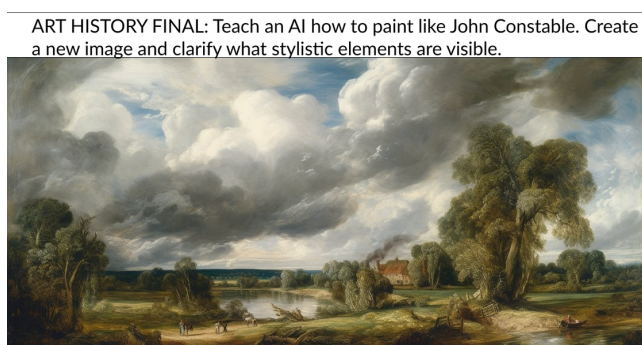


Turn an explosion into art using AI.

Turn an explosion into art using AI. Ira Greenberg, Director of the Center of Creative Computation and Professor at SMU. (The slides spell it “Greenburg”; the correct spelling is Greenberg.)



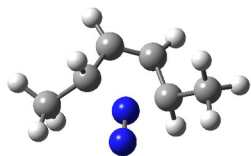
Ira Greenburg, Director of the Center of Creative Computation and Professor at SMU



Ira Greenburg, Director of the Center of Creative Computation and Professor or 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.

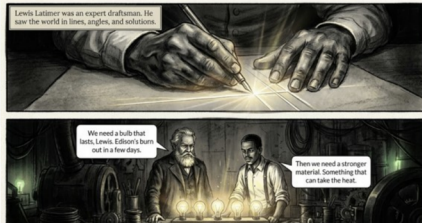


Sora (Open AI)
Veo (Google)
pika.art (free)
heygen.com
invideo.io
synthesia.io
kapwing.com
colossyan.com



- ▶ [pika.art \(free\)](https://pika.art)
- ▶ [HeyGen](https://heygen.com)
- ▶ [invideo](https://invideo.io)
- ▶ [Synthesia](https://synthesia.io)
- ▶ [Kapwing](https://kapwing.com)
- ▶ [Colossyan](https://colossyan.com)

GRAPHIC NOVEL



- ▶ [Eric Curts — graphic novels with NotebookLM \(25 examples + script template\)](#)
- ▶ [AI Comic Factory](#)

Controversy Comparison

Susan Ray, Delaware County Community College

- **Free write on a controversial issue of your choice**
 - Should schools ban smartphones during the day?
- **Ask 5 AIs for a clear evidence-based solution**
- **Compare the outputs**
 - What's amplified?
 - What's left out?
 - How does each model frame the issue?
 - What do this reveal about the priorities & politics of the companies?
- **Essay: how does this complicate your views of LLMs?**

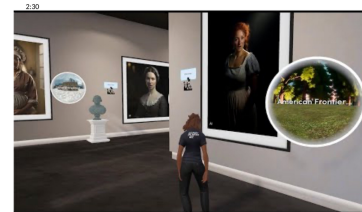
Susan Ray, Delaware County Community College.
Closing essay: how does this complicate your views of LLMs?

Hall of Ordinary Revolutionists

Retha Hill at ASU Cronkite school of Journalism and Mass Communication

Research records, diary entries, letters and ancestral photographs to bring the story of and underrepresented character to life in an authentic historical 3D scene. For example, Hannah Till, the pastry chef of George Washington during the encampment of Valley Forge.

1. Use ChatGPT and Transkribus to understand/inform the dialect.
2. Generate full-color images if you do not have color images.
3. Use D-id.com to make talking portraits.
4. Use Eleven Labs recreated the audio narration
5. Use Unity & Spatial to create historically accurate 3D settings.



Retha Hill's Hall of Ordinary Revolutionists in an authentic 3D scene (ASU Cronkite School of Journalism

and Mass Communication).

- ▶ [Video embedded in this slide \(YouTube\) — go to 2:30](#)

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](#)



Images generated with Perchance.

► [Perchance](#)



Using AI to Think Visually

Aashish Kumar Film and Media @ Hofstra University

- Practice making your visual intentions clear

A realistic photo of a dog on a lawn

...in front of a mid-century modern house, low-angle, wide-angle lens, late afternoon sunlight behind the house.

Style TERMS are Critical

Assignment from Aashish Kumar Film and Media @ Hofstra University

Art Deco	Early Cubism	Origami 3D	Impressionism

Create and Test Marketing Images

1. List three problems your product solves.
2. Create two Instagram ads (image+copy) for your new product with AI
3. Iterate to improve both.
4. Interview AI customers.
5. Use this to emphasize the emotional benefits in one ad and the product features in the other
6. Test the ads with AI and with real people



VIDEO: Puppramin Ad (slide 80)

AI-generated advertising parody — what persuasion looks like when video is cheap.

► [Video embedded in this slide \(YouTube\)](#)

STUDENT ASSIGNMENTS

AI can do (some) things humans can't

► [ISTE AI Innovator Challenge winners](#)

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

Add an AI project, element, reflection or feedback to an assignment.



ALL assignments are now AI assignments. Add an AI project, element, reflection or feedback to an assignment — and decide for each: AI-Transparent, AI-Resistant, or AI-Inclusive.

► [Assignment ideas — shared Google Sheet](#)

WORKSHOP: Redesign an Assignment or Course (slide 83)

You are an experienced expert in the science of learning. Analyze this assignment and help me transform it using one or more of these pedagogical practices or thinkers...

Re-imagine my course/assignment with standards-based grading/TILT etc.

► [Workshop Prompts & Materials](#)

SIMULATIONS, GAMES & ROLE-PLAYING

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.

result.

- [Examples, templates and instructions for building simulations and custom bots](#)
- [Interactive fiction and game design with Claude artifacts \(TCEA\)](#)



Stress Test a Plan (slide 85)

Complete Prompt:

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



The NotebookLM Literary Game



Michelle Kassorla
Georgia State University,
Perimeter College

Turn a work of literature
into a playable game.

Michelle Kassorla, Georgia State University,
Perimeter College: turn a work of literature into a
playable game.

- [The NotebookLM literary game — demo](#)
- [Assignment instructions \(Google Doc\)](#)

DEMO GAME

"The Tell-Tale Heart"

Edgar Allan Poe

Secure a confession before you
run out of heartbeats!



ASSIGNMENT INSTRUCTIONS



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)

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

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



- [Immigration wait-time artifact](#)

TRY A SIMULATION EXAMPLE

- 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



- [Middlemarch Tribunal simulation](#)
- [Workshop Prompts & Materials](#)

WORKSHOP: The President and the Economy Simulation Game (slide 90)

Create a presidential simulation game about the relationship between the economy and actions of the US President. You will guide me (the student responding as if I were the US president) through a multi-year simulation where I will create policies and you will simulate their effect on the US economy. Use the actual political situation of each time period. Start by asking me to pick a year (1800–present); reply with a summary of the US economic and political situation in January of that year using actual data and prompt me to take executive action. Do not allow actions that are not constitutionally possible for the President; point out if my actions exceed Presidential power and cite the sources for these limitations. Assess my strategy, describe how the economy would change over the next three months, update me, and repeat — advancing three months at a time for up to four years. When I am done, summarize my performance, compare it to what actually happened, tell me who the actual president was, and suggest ways I might have had greater impact within the limits of the US Constitution.

► [Workshop Prompts & Materials](#)



- [The President and the Economy — BoodleBox version](#)
- [SchoolAI student space \(code XHNM\)](#)
- [Create your own — examples, templates and instructions](#)

Jack: “He’s like you, but in the screen.”
Sarah Wymer, Auckland University of Technology

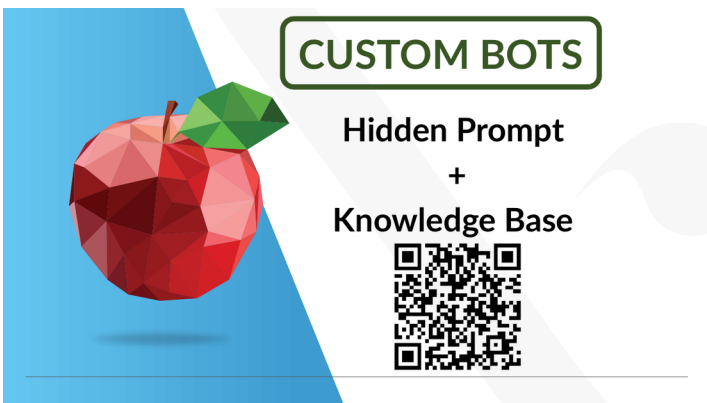
A team marketing expert for every student



87%
Jack helped refine my idea.

Jack, a custom AI agent modeled on Auckland FC’s real marketing manager — a team marketing expert for every student. Sarah Wymer, Auckland University of Technology. 87% agreed Jack helped them develop their idea further; 83% said he helped them think more critically.

- [What Jack the AI agent taught my class \(Sarah Wymer\)](#)



A custom bot is two things: a hidden system prompt that fixes the behavior (coach, don’t answer; one hint at a time; never give the solution) PLUS 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 with free models.

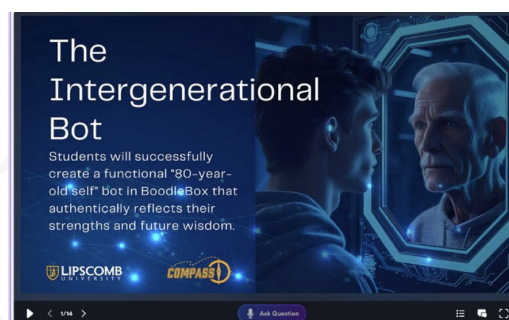
- [Examples, templates and instructions](#)

Bot Assignments & Simulations

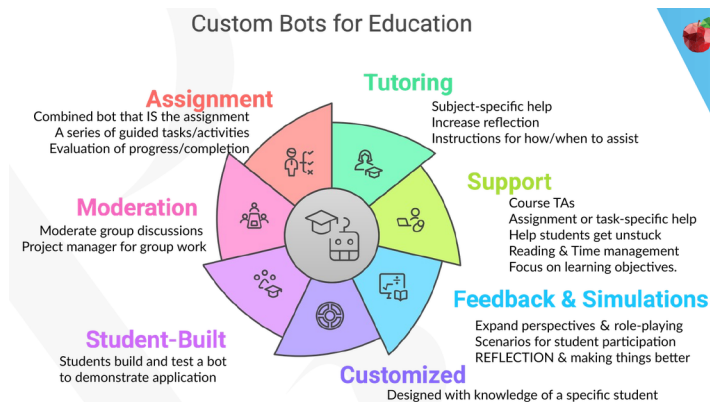
- Run a nuclear power plant
- Teach a class
- Run an experiment
- Secure capital
- Plan an exhibition
- Manage a lab
- Buy a car
- Moderate a disagreement
- Climb a mountain
- Improve a service
- Diagnose a problem
- Verify a story



Abby Bell
Lipscomb
University



Build a bot to talk to your 80-year-old self



Custom bots give you more control and security than sending students a prompt: you send a link to a tool you set up, and you can see everything students do (warn them!). In its simplest form a custom bot is just a prompt you have saved; add a knowledge base, learning outcomes and standards for more control. Platforms: BoodleBox (higher ed, AI-agnostic, free models available), SchoolAI (free, with a back-end showing engagement), GPTs (OpenAI), Assistants (HuggingFace), Bots (Poe).

► [Custom bot examples & Bowen's bot-building bot \(BoodleBox showcase\)](#)

YOU TRY: Meta-Prompting for Custom Assignments and Assessments

PROMPT 1: Provide me with 5 innovative ideas for how I could teach/assess student learning with a set of AI-led interactive exercises or an AI custom bot interactive simulation or game, where students have to demonstrate learning by interacting with a chatbot. + Learning Goals, Rubric or Professional Standard. + Context, Knowledge Base or Existing Assignment.

PROMPT 2 (iterate or pick your favorite idea): Now write an excellent prompt that will provide the instructions needed for an AI chatbot to create simulation #. The prompt should include instructions for customizing the experience for each student so that it is maximally motivating to individual student interests and will intellectually stretch the student. The assignment should be done in X number of parts...

- [Example conversation \(Claude\)](#)
- [Workshop Prompts & Materials](#)

AI FOR IMPROVING TEACHING

YOU TRY: More Focused Feedback

Use this assignment and rubric and keep the feedback kind, direct and supportive, but provide specific but brief guidance tied to the student draft and the assignment criteria. I am especially concerned with X. Show me a list of all the things the student should improve, but then also pick the one most important priority that should be the take-away for the student.

- ▶ [Hacks for Teaching](#)
- ▶ [Workshop Prompts & Materials](#)

COURSE PROFILE

KEY CONTEXT about your class

Demographics, Accommodations, Learning Goals, Syllabus...

- How could I make my assignments more motivating and compelling?
- Suggest readings or assignments that might better align with my goals and motivate these specific students?

VALID ASSESSMENT OF LEARNING IN UNDERGRADUATE EDUCATION

AAC&U



KEY CONTEXT about your class: demographics, accommodations, learning goals, syllabus...

How could I make my assignments more motivating and compelling? Suggest readings or assignments that might better align with my goals and motivate these specific students.

- ▶ [Teaching Assistant Blueprint Maker \(GPT\)](#)

Mollick, E., & Mollick, L. (2024, October 30). Stop writing all your AI prompts from scratch: These reusable templates can help. Harvard Business Publishing.

The 16 VALUE Rubrics



<https://www.aacu.org/valu>

Anatomy of the Critical Thinking VALUE Rubric

Dimensions	Performance Levels			
	4	3	2	1
Explanation of issues	Issues/problems to be considered critically & carefully, and then their complexity, allowing of relevant information necessary for full understanding.	Issues/problems to be considered critically & carefully, and then their complexity, but not fully understood, and/or background information.	Issues/problems to be considered critically & carefully, but not fully understood, and/or background information.	Issues/problems to be considered critically & carefully, but not fully understood, and/or background information.
Evidence: Taking of using information to investigate a point of view or evidence	Information is taken from sources with enough interpretation/evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from sources with enough interpretation/evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from sources with enough interpretation/evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from sources with enough interpretation/evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are questioned thoroughly.
Influence of context and assumptions	Thoroughly (methodically and methodically) analyses and shares assumptions and carefully evaluate the influence of sources when presenting a position.	Identifies and shares relevant context and assumptions when presenting a position.	Identifies and shares relevant context and assumptions when presenting a position.	Identifies and shares relevant context and assumptions when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/hypothesis) is articulated, and the complexity of an issue. Other points of view are acknowledged within position (perspective, thesis/hypothesis).	Specific position (perspective, thesis/hypothesis) is articulated, and the complexity of an issue. Other points of view are acknowledged within position (perspective, thesis/hypothesis).	Specific position (perspective, thesis/hypothesis) is articulated, and the complexity of an issue. Other points of view are acknowledged within position (perspective, thesis/hypothesis).	Specific position (perspective, thesis/hypothesis) is articulated, and the complexity of an issue. Other points of view are acknowledged within position (perspective, thesis/hypothesis).
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (implications and consequences) are logical and reflect student's informed evaluation and ability to apply evidence and perspective discussed in priority order.	Conclusions and related outcomes (implications and consequences) are logical and reflect student's informed evaluation and ability to apply evidence and perspective discussed in priority order.	Conclusions and related outcomes (implications and consequences) are logical and reflect student's informed evaluation and ability to apply evidence and perspective discussed in priority order.	Conclusions and related outcomes (implications and consequences) are logical and reflect student's informed evaluation and ability to apply evidence and perspective discussed in priority order.

YOU TRY: Design Activities

You are an experienced professor of X teaching CLASS on A (attached readings or content), focused on GOAL B, in COURSE C (attached syllabus), with STUDENTS: #, year, type, seating. DESIGN an interactive/activity/role-play etc. DURATION D. LIST any materials needed. PRODUCE nicely formatted handouts in MS Word. EXPLAIN your rationale.



AI Feedback as a Preview or Complement to Human Feedback

- What might an average reader/college professor/IRS auditor find confusing/objectionable/exciting?
- Give me feedback from a reader who misunderstands my intentions.
- Create feedback that will challenge me. Include feedback with inaccurate information.

WORKSHOP: Multiple Perspectives on My Teaching (slide 109)

Analyze this to help me improve it. First, do multiple individual analyses by a wide group of scholars with different views of learning, pedagogy and behavioral science. Start with Jean Piaget, Lev Vygotsky, UDL Framework...

► [Workshop Prompts & Materials](#)

WHEN to use AI Grading

- Transparent
- Increase Feedback & Learning (Stakes & Type of Assignment)
- Creates a BETTER assessment?
- Mastery or Growth? (Transactional or Relational?)



COGNITIVE FITNESS

AI as a **SKILL** for
WORKING and **THINKING**

AI as a **BASELINE** for
AVERAGE

AI as **TOOL** for
CREATIVITY & LEARNING

AI DANGERS

- Creativity
- Academic
- Economic
- Political
- Psychological
- Environmental

EVERYONE IS NOW AN

AI Manager



- Which tasks should you delegate?
- AI needs direction, feedback & correction.
- AI delegation is a skill, not a shortcut.
- AI needs your judgment.

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.

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

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>

<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>

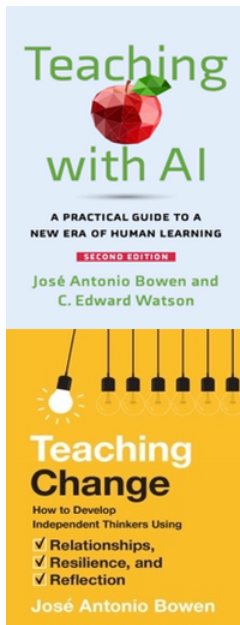
<https://doi.org/10.1186/s40561-024-00316-7>

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>

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 \(often 25% off\)](#)