

AI TEACHING & LEARNING SERIES: TEACHING IN THE TWO LANES

Rob Huang, PhD

Educational Developer, Instructional Practices & Student Engagement


rob.huang@utoronto.ca


Robert Gillespie Academic Skills Center



OUTCOMES

- Distinguish between Lane 1 (AI-secured) and Lane 2 (AI-integrated) assessments and explain the pedagogical role of each.
- Review current course assessments to determine lane alignment and identify where integrity-focused adjustments may be required.
- Design a low-stakes Lane 2 activity that scaffolds students' productive and ethical use of AI tools

 **Can use Generative AI tools**

 **Can use Generative AI in certain instances or specific ways**

 **Cannot use Generative AI**

<https://www.vicprovostundergrad.utoronto.ca/wp-content/uploads/2024/08/Syllabus-language-for-Gen-AI-2024-08-21.pdf>

THE TWO LANE MODEL

Lane 1: Secured, in person	Lane 2: Open
Assessment OF Learning	Assessment FOR learning
Form trustworthy judgements of student learning	Equip students to participate ethically and actively in a society pervaded with AI
e.g. In person oral assessments, supervised exams, practicals etc.	e.g. AI to brainstorm, reflect, summarize, critique, synthesize, provide alternative POVs etc.

ALL LANE 2...



COGNITIVE OFFLOADING – DRAWBACKS

- Short-term gains comes at the price of long-term knowledge and expertise, as core cognitive work is bypassed (Grinschgl, Papenmeier & Meyerhoff, 2021)
- Significant negative correlation between frequency of AI tool usage and critical thinking ability (Gerlich, 2025)



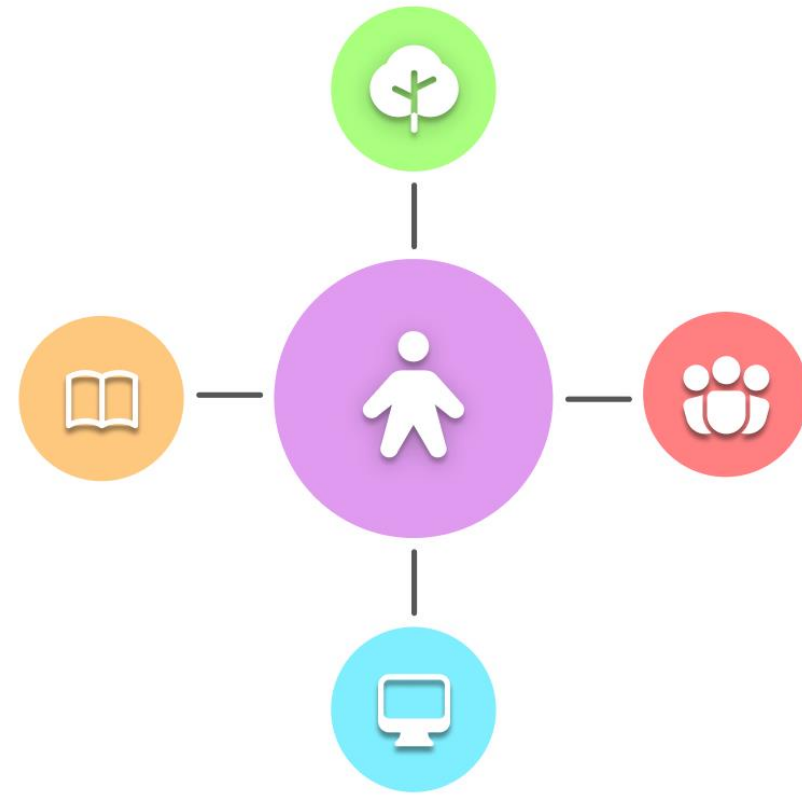
gemini.google.com

ALL LANE 1...



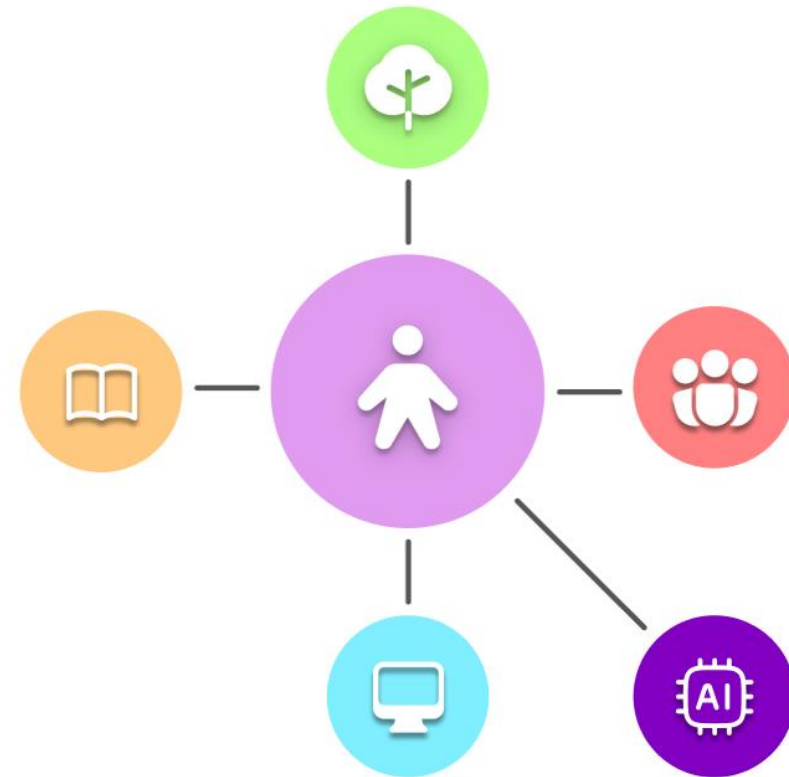
DISTRIBUTED COGNITION

- Real-world thinking is distributed out across our minds, bodies, the tools we use, and the people we interact with (Hollan, Hutchins & Kirsh, 2000)



DISTRIBUTED COGNITION W/ GENAI

- What is the role of this new partner in the learning process?
- How do we ensure the student remains the leader of this cognitive partnership?
- How do we design tasks that leverage the entire system?
- What emotional connections do we develop while learning with AI?



LANE 1: ASSESSING CORE LEARNING

- Doesn't always have to be 3 hour exam
- Could be:
 - In-class sprint: writing an outline without assistance
 - Interactive oral that defends the work
 - Unassisted critique of errors in an artifact (text, video etc.)

LANE 2: SCAFFOLDING AI

- Rather than letting students “do whatever they want” we need to scaffold that workflow
- The focus should be tool agnostic and focus more on the logic of the workflow
- Leon Furze’s 5 Ways to Learn with AI is great approach
 - Learn **About** AI
 - Learn **With** AI
 - Learn **Through** AI
 - Learn **Against** AI
 - Learn **Without** AI

LANE 2 EXAMPLES

- Critical Audit (Against AI)
 - E.g. generated summary of the reading(s) using AI. Audit it for accuracy, relevance, and nuance against your understanding of the topic and other sources.
- Prompt Wrapper (With AI)
 - E.g. Use AI to aid your brainstorm. Submit a log of your interaction and reflections on your thinking as you navigated the discourse with AI.
- Role-Play (Through)
 - Convince the AI (which you've given the role as a skeptic) that your argument(s) are valid. Support this with evidence of your interactions.

ALTERNATIVES TO SUBMITTING “ THE LOG ”

- The Highlight Reel
 - Submit keep shifts in the conversation (hallucination/drift, prompts used to fix it, final output you accepted)
- Citation method
 - Cite AI like a colleague
- Methodology statement
 - Describe your cognitive split (% AI vs. % student)

BUILDING LANE 2

Audit & Design



SYLLABUS REVIEW

Assessment Task	Cognitive Goal	Offloading Potential	Revision
Read the article and post a 250 word summary	Verify reading comprehension	High	Lane 1: One minute paper in-class Lane 2: Critique AI output in comparison to your own reading
Write a python script to calculate x	Understand syntax & logic	High	Lane 1: whiteboard coding in tutorial (explain verbally) Lane 2: Debug and optimize existing AI generate code and explain why it could be improved.
Write a reflection about your placement experience	Metacognition and emotional processing	Medium / High	Lane 1: Audio/Video submission where students uses their phone to record for 3 min. Lane 2: Input notes, ask AI for thematic map, write on if AI interpreted experiences and emotion correctly etc.

DESIGN TEMPLATE

- Base Task: Write a marketing plan.
- The AI Role: AI is the *obstacle*, it provides a flawed plan.
- The Human Role: *Auditor*, finding the flaws
- The Artifact: Submit an annotated PDF and 200 word

EXAMPLE BEFORE VS. AFTER

- Instructions
 - Write a 1000 words on the causes of WWI
 - Risk
 - Student pastes the assessment instructions into ChatGPT; 100% offloading
- Instruction
 - 3 different AI explanations for the causes of WWI have been generated. One focuses on economics, one on politics, one is hallucinated
 - Identify which is which, critique the bias in the economic one, and synthesize a final argument citing real course readings
 - Grading
 - The critique and the synthesis

RETROFIT CARD

- My assignment: _____
- The AI Role (choose one):
 - Generator (student critiques it)
 - Simulator (student argues with it)
 - Drafter (student refines / wraps it)
- What will I grade?
- Where is the evidence of learning?

TAKEAWAY

Lane 1: Secured, in person	Lane 2: Open
Assessment OF Learning	Assessment FOR learning
Form trustworthy judgements of student learning	Equip students to participate ethically and actively in a society pervaded with AI
e.g. In person oral assessments, supervised exams, practicals etc.	e.g. AI to brainstorm, reflect, summarize, critique, synthesize, provide alternative POVs etc.
Build up the internal schema required to expand	Build the executive agency required to scale output, and ready for changing landscape

**APPRECIATE
YOUR FEEDBACK!**

<https://forms.office.com/pages/responsepage.aspx?id=JsKqeAMvTUuQN7RtVsVSEIA9B3QzRO5ltPy1nLGPwcVUQTU5TUxQUjdURTU4Rjg0VFhSUVFBMTQwRC4u&route=shortur>

↓

**Workshop Feedback for "AI
Teaching and Learning Series 4"**



Q & A

Would love to hear your thoughts!



REFERENCES

- Bridgeman, A., Liu, D., & Weeks, R. (2024, September 12). Program level assessment design and the two-lane approach – Teaching@Sydney [Teaching@Sydney]. *Program Level Assessment Design and the Two-Lane Approach*. <https://educational-innovation.sydney.edu.au/teaching@sydney/program-level-assessment-two-lane/>
- Gerlich, M. (2025). AI Tools in Society: Impacts on Cognitive Offloading and the Future of Critical Thinking. *Societies*, 15(1), 6. <https://doi.org/10.3390/soc15010006>
- Grinschgl, S., Papenmeier, F., & Meyerhoff, H. S. (2021). Consequences of cognitive offloading: Boosting performance but diminishing memory. *The Quarterly Journal of Experimental Psychology*, 74(9), 1477–1496. <https://doi.org/10.1177/17470218211008060>
- Hollan, J., Hutchins, E., & Kirsh, D. (2000). Distributed cognition: Toward a new foundation for human-computer interaction research. *ACM Transactions on Computer-Human Interaction*, 7(2), 174–196. <https://doi.org/10.1145/353485.353487>
- Perkins, M., Furze, L., Roe, J., & MacVaugh, J. (2025). *The AI Assessment Scale*. <https://Aiassessmentscale.Com>. <https://aiassessmentscale.com/wp-content/uploads/2025/04/ai-assessment-scale-large.png>
- University of Toronto. (2024, August 21). *Syllabus-language-for-Gen-AI-2024-08-21*. Office of the Vice Provost, Innovations in Undergraduate Education. <https://www.viceprovostundergrad.utoronto.ca/wp-content/uploads/2024/08/Syllabus-language-for-Gen-AI-2024-08-21.pdf>