

# Supporting Original Thinking

Creating the conditions for  
productive struggle

# Housekeeping



- **Webinar Recording will be shared with all attendees within 2 days.**
  - Access all recordings at [Packback.co/events](https://packback.co/events)
- **Ask all questions with the Q&A feature.**
  - The Q&A feature will allow for questions to be answered by all panelists.
- **Use the chat for discussion and sharing.**
- **Panelists & Packback team members will be monitoring the Q&A and using the chat to share resources.**

QUICK POLL

**How do you think *your students* perceive the impact of GenAI on their education experience?**

Please answer in the zoom polling function!

# Today's Panelists



**Dr. Craig Booth**

Chief Technology Officer  
*Packback*



**Barbara Kenny**

Principal Product Manager, R&D  
*Packback*



**Cynthia Wilson**

Vice President for Learning and  
Chief Impact Office  
*The League for Innovation in the  
Community College*

# Why This, Why Now?



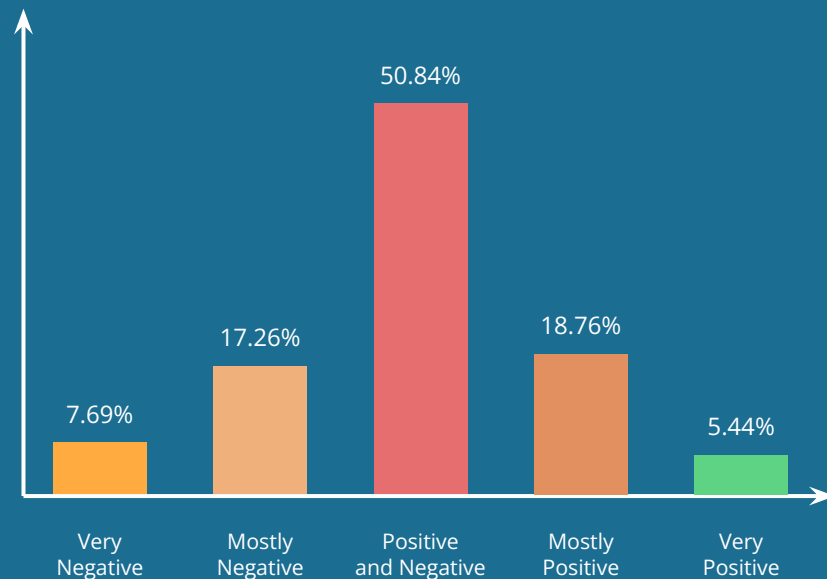
# Student Feedback

Packback surveyed students on their sentiment toward Generative AI. The survey was sent to a random sample of students enrolled in at least one Packback community since January 1, 2025.

We received 691 student responses. Insights from this survey will be shared throughout the webinar to ground our discussion *with real student voices*.

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*How do you feel generative AI is impacting your educational experience?*



**PART 1**

# **The View was Never the Point:**

*AI, Friction and Struggle*

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**PART 2**

## **Why Students Reach for Shortcuts:**

*The Root Causes*

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**PART 3**

## **Scaffolding the Process:**

*Applications of Self-regulated Learning*

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**PART 4**

## **Designing for Development:**

*Strategies for the "Messy Middle"*

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**PART 5**

## **Developmental Mirrors:**

*Originality, Process Tools & Actionable Insights*

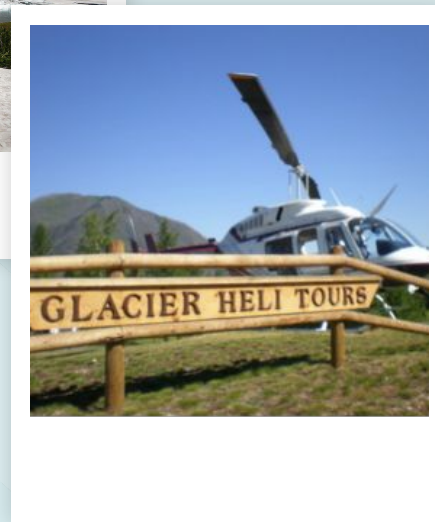
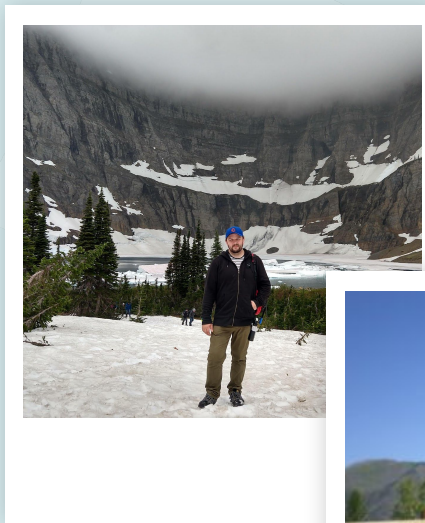
# The View Was Never the Point

In education, we often reward the view:

- The polished essay
- The correct answer
- The clean solution

But the value was always in the climb:

- The false starts
- The revisions
- The judgment calls



The view **used to be** a good signal that the climb happened.

# The Cost of Removing Struggle

## Productive difficulty builds...

### Metacognition

*Thinking about one's own thinking*



"Students can be actively involved in classroom activities, appear to understand what is going on, and yet learn nothing new. Much of what goes on in classrooms creates an illusion of learning rather than real learning."

*Nuthall, 2007*

### Transfer

*Applying learning to new contexts*



"The greater efficacy of productive failure over direct instruction lies not in the development of procedural knowledge but in conceptual knowledge and transfer."

*Kapur, 2016*

### Judgment

*Knowing what's good, appropriate, or defensible*



"Expert adult performers... are judged on their interpretation and ability to express meaning, not merely technical proficiency."

*Ericsson et al. , 2016*

**... remove the struggle, and you remove the conditions for learning.**

# When Help Arrives Too Early

This is not new– short-circuiting struggle with well-intentioned hints and scaffolds happened well before AI.

But AI automates it– it doesn't just help when students ask..

**It anticipates, suggests, completes.**

Routine rescue makes effort optional and undesirable.



The cognitive load **and reward** are removed before it's even experienced.



# The risk *isn't* using AI.

It's **not knowing** what you  
understand anymore.

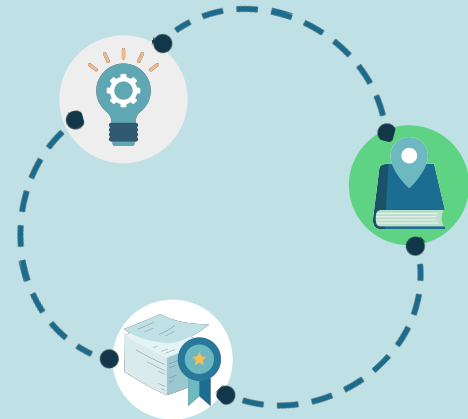
# Reframing the Goal: *Process Over Polish*



If we focus on the final artifact, learning suffers.



Learning lives in how the work was shaped.



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# Root Cause #1: Lack of Clarity

*Sometimes some concepts are **confusing to understand**, and when I don't have time to ask my professors, especially when they're unavailable, it allows me to ask questions and follow-up questions.*

*I was not very interested in the topic nor did I know much about it... I mostly used ai to **get an understanding**.*

*I use AI for **clarification** on things I am unsure about.*

*I don't think I have used it for an entire assignment since high school, but it was because I was **confused** or just being lazy mostly.*


# Root Cause #1: Lack of Clarity

**Cognitive Load Theory says learning is limited by working memory.**

Effective instruction minimizes unnecessary cognitive demands

- Attempts to reduce unnecessary load
- Rational help-seeking under ambiguity

## Cognitive Architecture and Instructional Design: 20 Years Later

John Sweller<sup>1</sup>  • Jeroen J. G. van Merriënboer<sup>2</sup> • Fred Paas<sup>3,4</sup>

Published online: 22 January 2019  
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*“Cognitive load is increased when unnecessary demands are imposed on the cognitive system. If cognitive load becomes too high, it hampers learning and transfer.”*

(Sweller, van Merriënboer, & Paas, 2019, p. 2)

*“Extraneous cognitive load is not determined by the intrinsic complexity of the information but by how the information is presented and what learners are required to do.”*

(Sweller et al., 2019, p. 4)



## Root Cause #2: Lack of Motivation

*really hard to sit down on  
**focus on something I'm not  
interested in***

*I was **not very interested in  
the topic** nor did I know  
much about it and since it  
was an elective topic I  
decided to write it with A.*

*Some of the smaller paragraph  
writing assignments **I felt were  
more just there to get points**  
after reading through said  
assignment.*

# Intrinsic Motivation

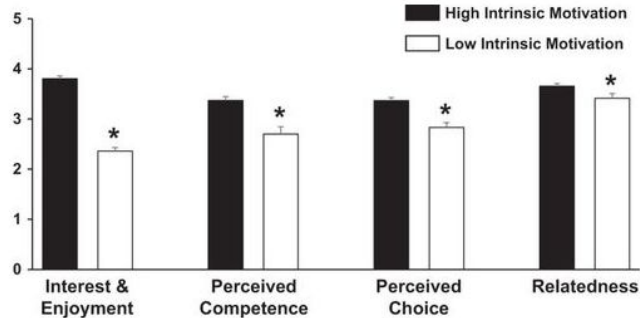
Students with *low* intrinsic motivation had *significantly* lower grades.

🏠 Illuminations

## Intrinsic motivation: an overlooked component for student success

Robert A. Augustyniak, Adrienne Z. Ables, Philip Guilford, Heidi L. Lujan, ... See all authors

03 OCT 2016 // <https://doi.org/10.1152/advan.00072.2016>



*Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions*

Richard M. Ryan & Edward L. Deci

*Institute for Positive Psychology and Education, Australian Catholic University, Australia  
University of Rochester, United States*





# Root Cause #3: The Reward Mismatch

*When I'm paying for a class that i'm required to take but don't necessarily need, I **do not find any value in putting in my own effort for what is essentially "busy work"***

*My brain feels rotted but it gets it done which most of the work is **just busy work** not actual helpful assignments*

*Usually this is due to a combination of reasons. **Being short on time, being uninterested in the topic, feeling like the effort is not worth it** because I will not use the content in my life or future work, etc.*

# Root Cause #3: The Effort/Reward Mismatch

When effort is high and intellectual reward is low, students behave like rational actors and outsource the work.

They constantly evaluate:





- How hard is this?
- What do I get in return?

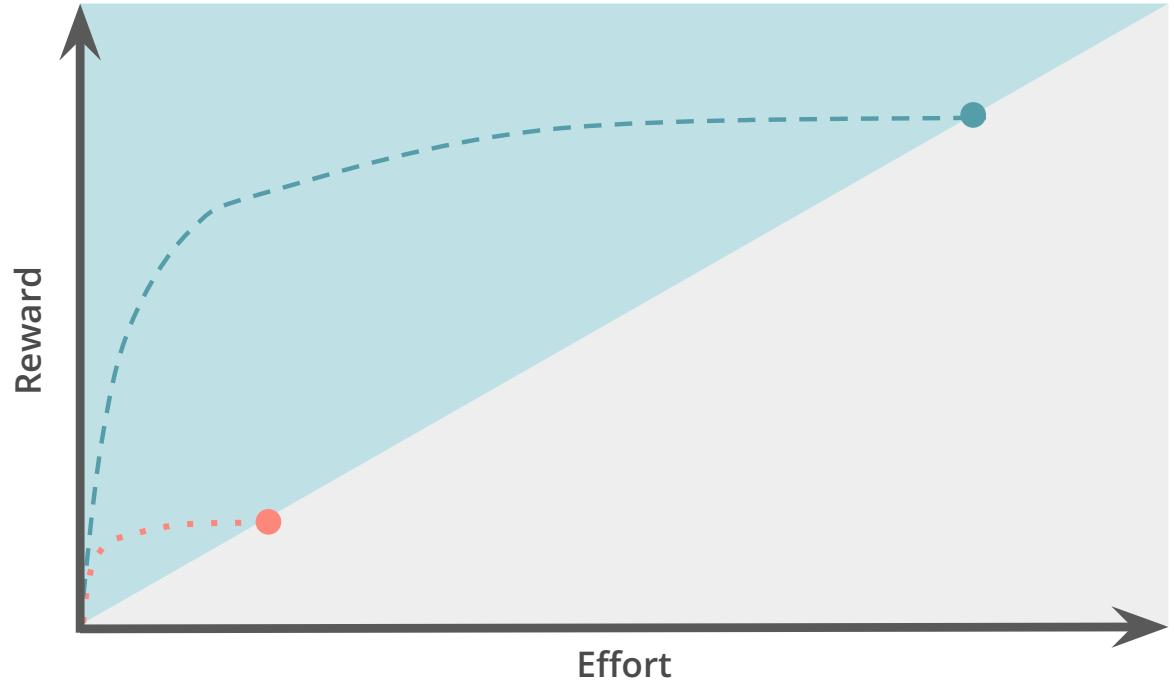
**Is the reward the grade or the learning?**



# Root Cause #3: The Effort/Reward Mismatch

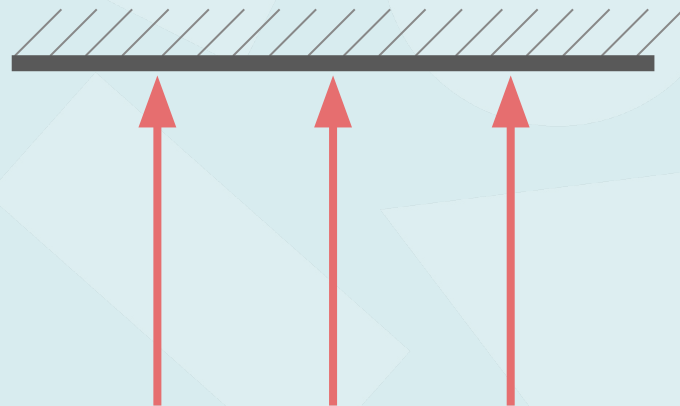
## Legend

-  "This is worth my time"
-  "This isn't worth it to me"
-  Intrinsically rewarding work
-  Intrinsically non-rewarding work



# Grades, Effort, and Motivation

- **Grades can trigger effort** but rarely sustain deep engagement.
- **Extrinsic rewards drive compliance**, not curiosity.
- This caps how much effort the system can elicit.



# Designing for High Cognitive ROI

Design challenges where students experience:

- Genuine insight
- Personal voice
- Transferable understanding

When discovery is the payoff, shortcuts are less appealing.

Even for a student for whom the grade is the reward, they'll be unable to appreciate anything else unless they can see it.



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# Cognitive Offloading Is Older Than AI



**AI didn't create the problem.  
It just made it frictionless.**

# The Emergence of Self-regulated Learning

- Early approaches focused on: Study tips, Time management & Compliance
- Researchers noticed high performers didn't just work more, they worked differently
- This shifted the question from effort to regulation

## SYNTHESIS:

**High achievement is not a function of effort alone but a function of how learners regulate effort.**

“*Self-regulation is the self-directive process by which learners transform their mental abilities into academic skills.*”

Zimmerman (2002)

# The Emergence of Self-Regulated Learning

**Learning improves when students can see and manage their process.**

Educational psychology in the late 20th century.

Reframes learning as an active, cyclical process.

Students are:

- Planners
- Monitors
- Evaluators

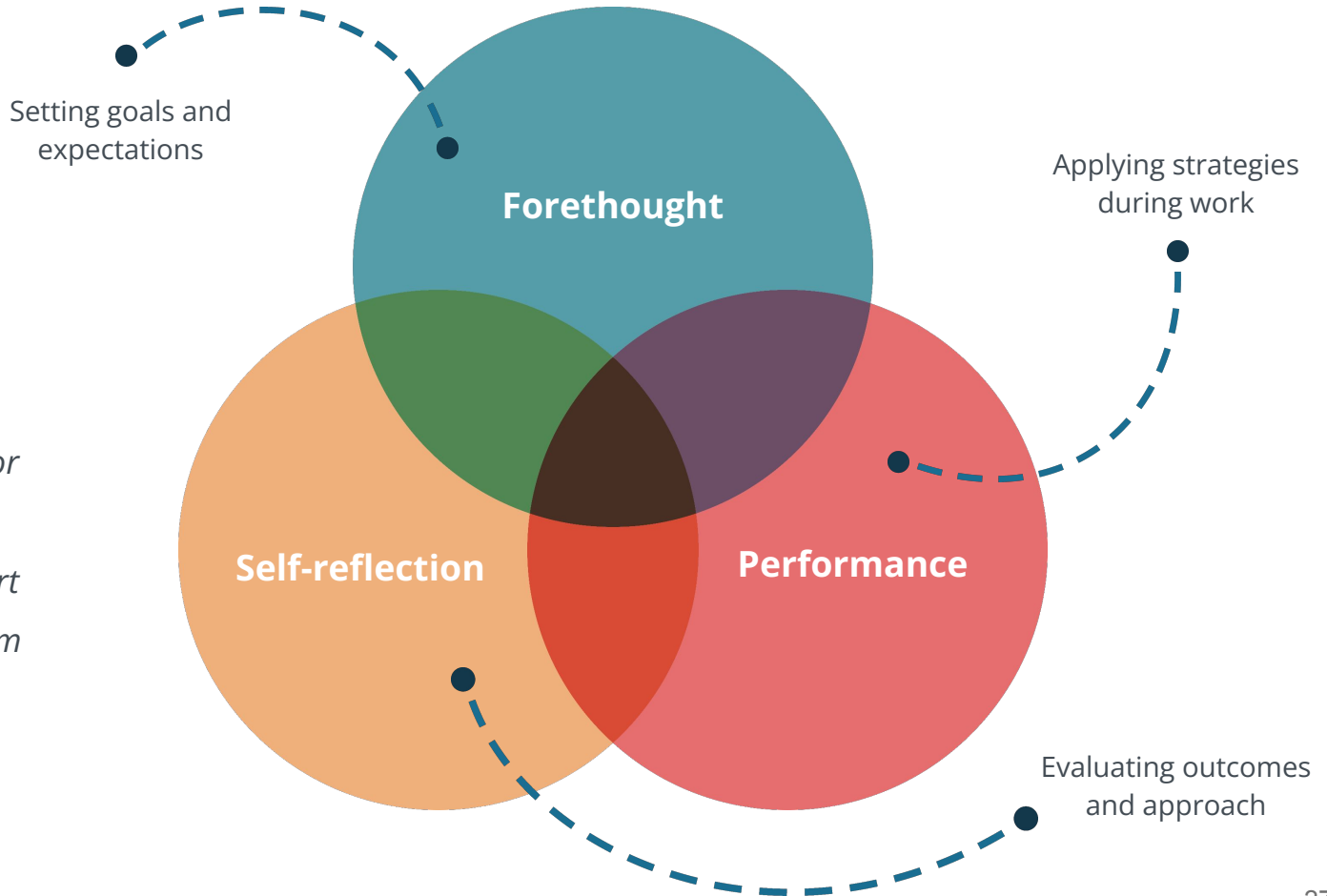




*Learning is viewed as an activity that students do for themselves in a proactive way rather than as a covert event that happens to them in reaction to teaching.*

Zimmerman (2002)

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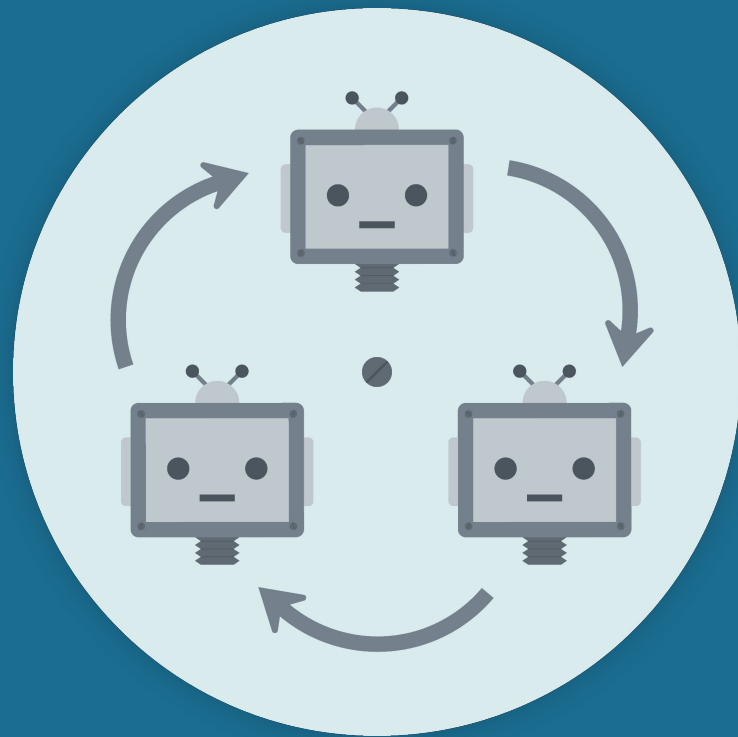


# AI Collapses The Cycle

With AI, the cycle compresses:

- Forethought disappears
- Performance becomes execution
- Reflection feels unnecessary

**Students jump straight to results.**





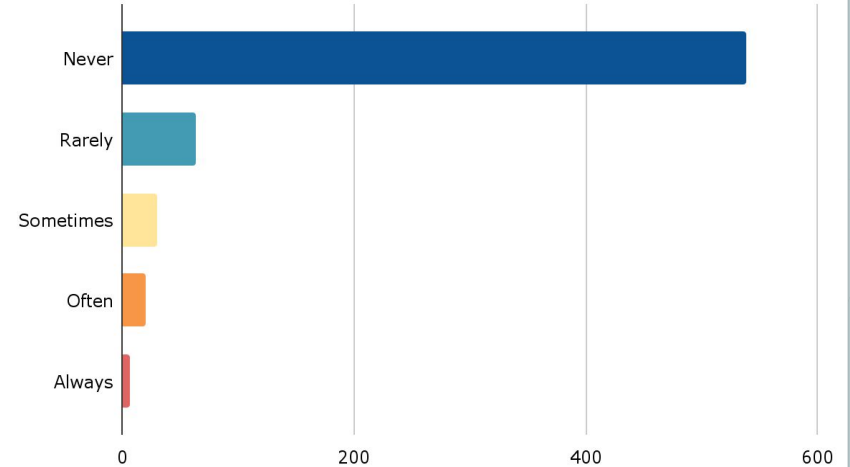
# Self-Regulated Learning & AI Use

Students who report using AI to write their entire assignment are also more likely to use it for additional offloading tasks and less likely to use it for planning or idea development.

***Emerging research suggests that self-regulation is the key difference.***

The same tool can either bypass effort or, in the hands of a self-regulated learner, function as a thinking partner that strengthens critical thinking and metacognition.

During your most recent academic term, how often have you used generative AI tools to write your entire



# What Self-regulated Learning Actually Gives Us



## A Vocabulary

to describe the learning process



## A Direction

to help pinpoint breakdowns and failures



## Clues

about where intervention matters most

SRL is not a feature you can “add” to a tool.

**It doesn't magically make students reflective or disciplined**

# Self-regulated Learning is a Compass

SRL tells us what kind of scaffolds matter:

- Goal-setting prompts
- Mid-process checkpoints
- Post-task reflection artifacts



**Self-regulated Learning is not...**

A mechanism to enforce behavior



**Self-regulated Learning is...**

A way to make learning decisions visible to students and to educators

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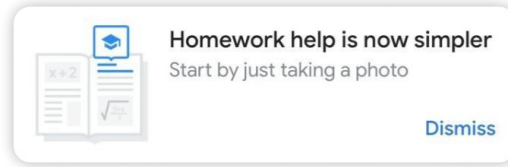
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# Productive Struggle by Design

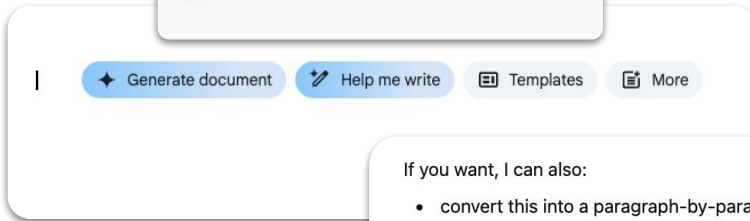
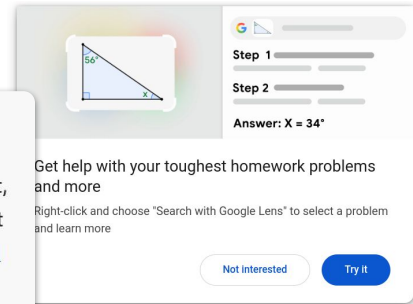
Students are being *invited and nudged* to skip the struggle at every turn.

We need to invite and nudge them to engage in the process.



**Get concise summaries**

All you have to do is ask. Upload a document, sign in and type a question to request a short summary of your document. With [Acrobat AI Assistant](#), you can save time and understand key points in seconds.




If you want, I can also:

- convert this into a paragraph-by-paragraph essay plan
- add sample thesis statements with different argumentative angles
- align it to APA/MLA research expectations
- build a version for middle school, high school, or college level


Tell me the audience and assignment requirements, and I will refine it.

📄 👍 🗣️ ⬆️ ↻ ⋮


# Conditions for Productive Struggle




**Calibrated Challenge**  
Tasks exceed current ability but remain achievable with **support**.




**Designed Friction**  
Difficulty is intentional, structured, and aligned with learning goals.



**Process Feedback**  
Learners receive ongoing coaching that targets strategies and errors.



**Meaning-Making**  
Metacognition and collaboration transform effort into understanding.



**Psychological Safety**  
Failure is informational. Early attempts are low stakes and **supported**.

# Productive Struggle in Practice

## *Delay* the moment of offload

Create quick, low-stakes moments for students to share early thinking and goals with a peer or instructor before starting a task.

## *Stretch* the curiosity gap

Before instruction on a new concept/skill, design tasks where students' attempts, questions, misconceptions, and evolving thinking are the intended outcome.

## *Interrupt* the isolation loop

Design structured opportunities for students to test ideas in dialogue, compare perspectives, and co-construct understanding before relying on AI or developing ideas in isolation.

### What to Avoid:

**Friction for Friction's Sake:** Avoid compliance-based barriers that feel like busy work or challenges too far out of reach. The goal is to preserve intellectual reward, not just add time or frustration.

# Open Transparency & Reflection

Students are being nudged into a performative compliance loop.

We need to nudge them out of the cycle of suspicion and into a practice of authentic inquiry.

*The New York Times*

A New Headache for Honest Students: Proving They Didn't Use A.I.





Greater concern with **being wrongly accused of using genAI** was NOT significantly related to more frequent use of AI for any academic tasks.

This indicated that students NOT using generative AI are impacted by this fear just as much as students who are using it. And potentially, detection alone isn't a reliable deterrent for those tempted by the shortcut.

*I've just been accused of it on a difficult paper, while a classmate used AI the entire semester. It's causing me to **lose faith and adding stress***

*AI has only caused harm. As a smart student who excels at writing, **teachers have gone from impressed to suspicious.** My work as a 4.0 GPA student is now regarded with suspicion- I wish we could remove AI from every aspect.*

*Frankly, my experience using generative AI results in **stress and anxiety due to the fear of being accused.***

*Sometimes **AI detectors are just wrong** and students are left being **accused** with the difficulty of having to **prove they did their own work.***

*Something that will get rid of the **anxiety** of turning in an assignment not knowing whether or not they **will accuse me of ai.***

*When most of my classmates are truthful about their work and some others are not; then the **people who are honest have consequences** for other people's actions.*

# Open Transparency & Reflection in Practice

## *Surface* the decision path

Invite students to identify their own key decision moments, highlighting how and why choices were made rather than tracking tools or creating usage logs.

## *Strengthen* the noticing muscle

Design low-stakes comparison moments where students examine their thinking alongside AI outputs, peer ideas, or prior work to recognize patterns and build discernment.

## *Shift* reflection forward

Ask students to notice and name specific actions, patterns, and next steps without judgment, focusing on forward-looking awareness rather than backward justification.

### What to Avoid:

Avoid reflections that risk becoming hollow "mini-products" written for someone's approval, and ensure transparency efforts are built on a foundation of mutual curiosity rather than surveillance or suspicion.



# Reinforcing the struggle

When help arrives too early it gives the signal that struggle is something to be avoided, instead of a necessary and normal part of learning.

**We need to not only build the struggle back it, but reinforce it.**

*As someone with **anxiety that turns into extensive procrastination**, AI would help me to take that first (often most hardest step) of actually starting an assignment.*

*Helped me get started on an assignment that might have felt **too daunting** or caused procrastination.*

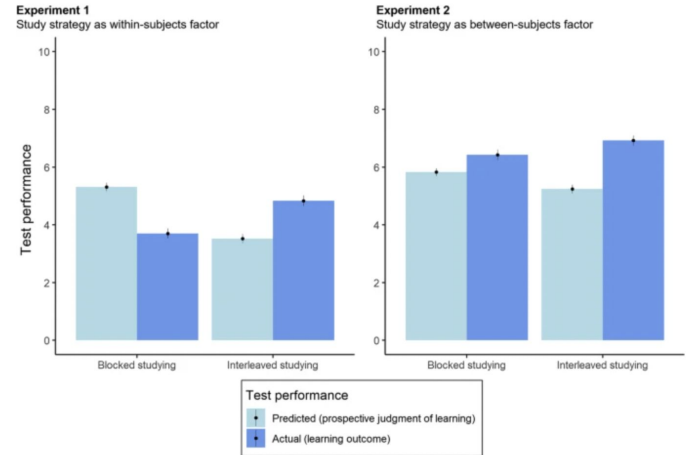
*Understanding **difficult** pieces of reading, using it to help when I'm **stuck** on a math problem*

*Sometimes it's just because **I don't feel smart enough***

*Made me feel less **intimidated** by some larger assignments because it was able to assist me in being efficient with my time."*

# The Experienced Learning vs. Actual Learning Paradox

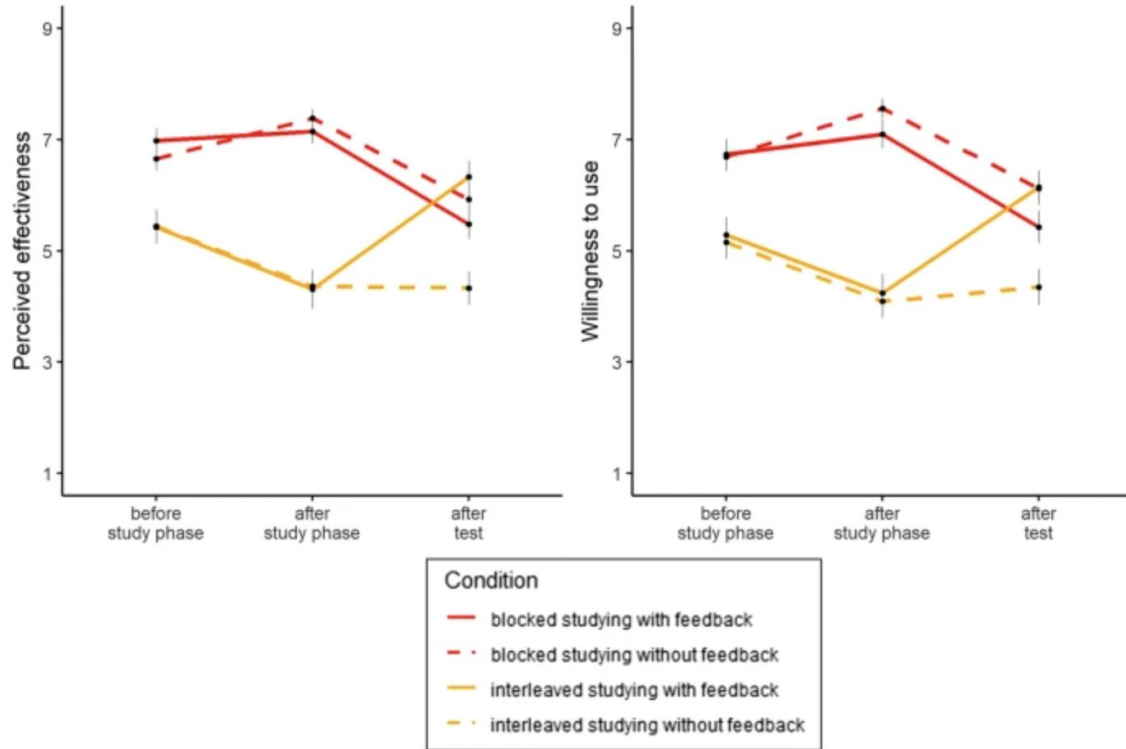
*“Greater perceived effort, even when resulting in better objective learning, leads learners to feel that they are learning less, especially because many learners hold the mindset that effort is a sign of poor ability rather than growth” (Yeager & Dweck, 2012).*



Prospective judgments of learning (predicted test performance) and learning outcomes (actual test performance). Note. Error bars represent standard errors

### Experiment 1

Study strategy as within-subjects factor



## QUICK POLL

**In your class, how visible are the 'messy middle' stages of a project (the mistakes, the bad drafts, the dead ends)?**

Please answer in the zoom polling function!

# Reinforcing the Struggle in Practice

## ***Explain* the value of the struggle**

Explicitly teach students that effort drives learning, clarifying the “why” behind challenging tasks so friction feels meaningful rather than arbitrary.

## ***Coach* the thinking process**

Provide formative, process-focused feedback that highlights reasoning, strategies, and growth rather than focusing only on final results.

## ***Elevate* mistakes as artifacts**

Create space for students to share unfinished ideas and errors, reinforcing that missteps are expected signals of learning in progress.

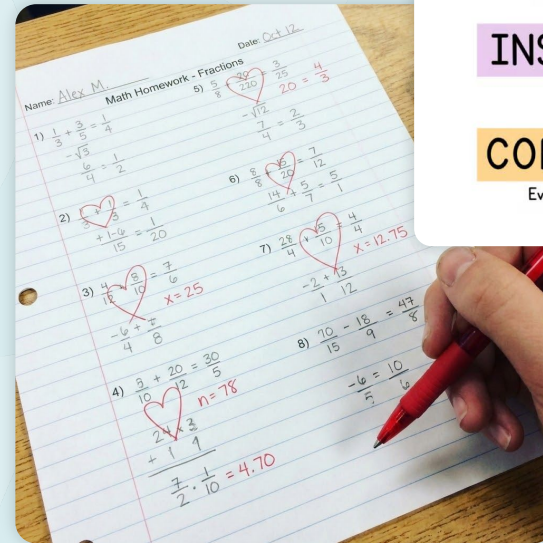
### **What to Avoid:**

Avoid assigning high-friction tasks without explaining the purpose, letting the artifacts disappear into the void, or using them as a form of surveillance. ***The goal is to validate the effort of the climb, not police the path taken.***

# On a Personal Note

Countries that top the world in math achievement, such as China, deal with mistakes very differently...The teacher gave the students deep conceptual problems to work on and then called on them for their answers. As the students happily shared their work, the interpreter leaned over and told me that the teacher was choosing students who had made mistakes. **The students were proud to share their mistakes, as mistakes were valued by the teacher.**

Jo Boaler, The Power of Mistakes and Struggle



## MISTAKES ARE...

**EXPECTED** 

Mistakes are a necessary part of learning.

**RESPECTED** 

In this class, we like mistakes.

**INSPECTED** 

We analyze mistakes.

**CORRECTED** 

Every mistake you correct helps your brain grow.

@teachings32



# The Human Loop

When human support systems are unavailable or intimidating, AI becomes the "on-demand" tutor and collaborator.

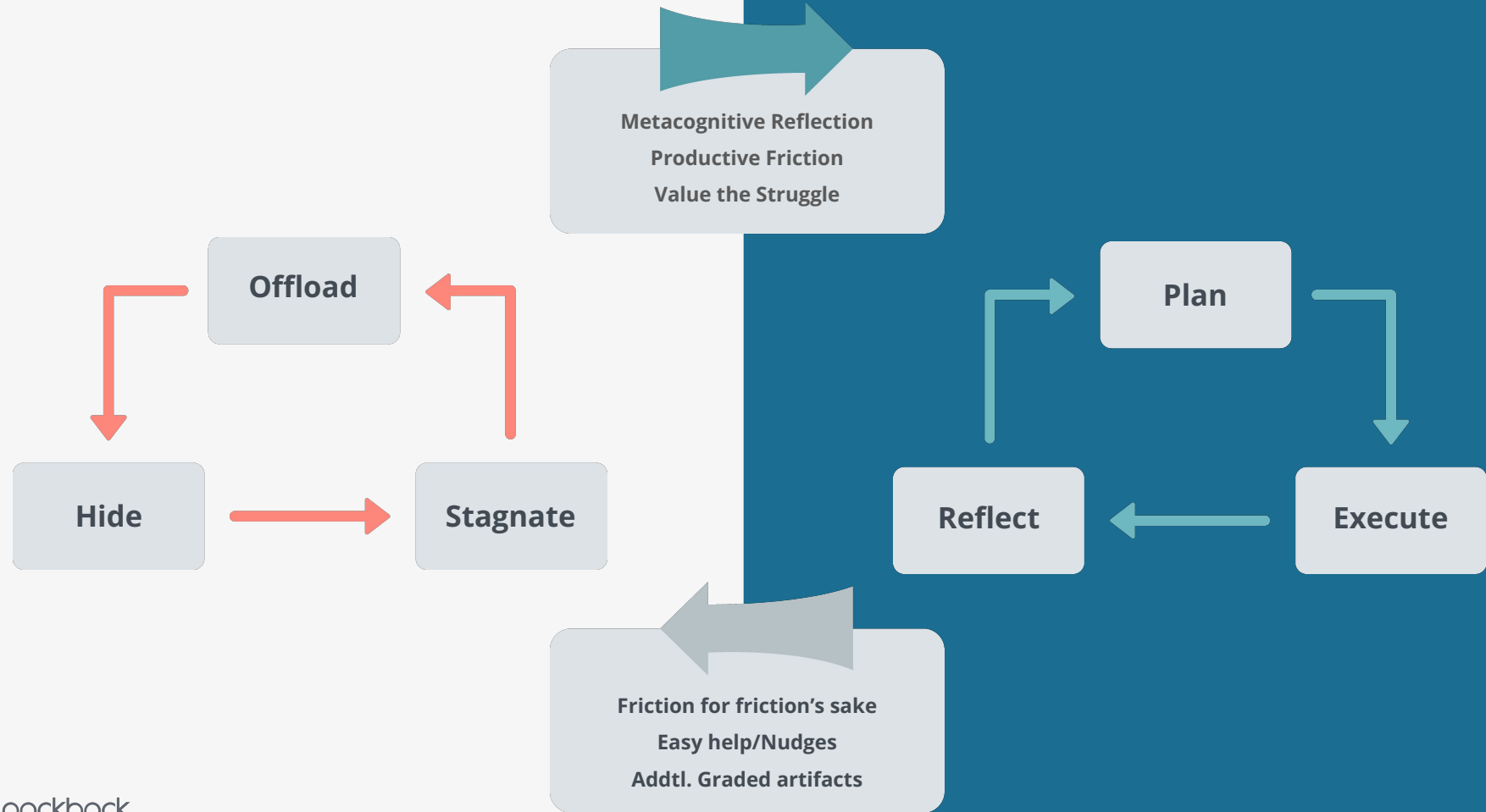
- The risk of deferring to "AI expertise" is greater when there are no other voices in the room
- Balance AI integration with more human touchpoints
- Think critically about any tool or process that thins out human connection

*Reduced the amount of time it took to brainstorm, and **allowed me to brainstorm without access to human collaborators***

*It helps me by being a reliable source that answers instantly; there is **no time waiting for the next help session or office hours.***

*It made me **feel less alone** and lost in my harder assignments. **It's easier to go to AI resources that humans.***

*I think it just has made brainstorming so much easier **when you are studying or working by yourself.** I think **people work better in a group** and so being able to get an opinion on your ideas even when not in a group has been very beneficial.*



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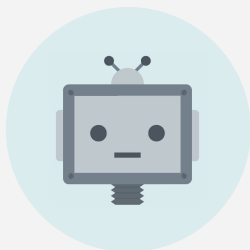
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## Developmental Mirrors:

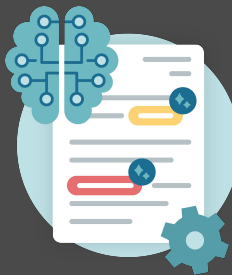
*Originality, Process Tools & Actionable Insights*



The question isn't  
"how to prevent AI use?"



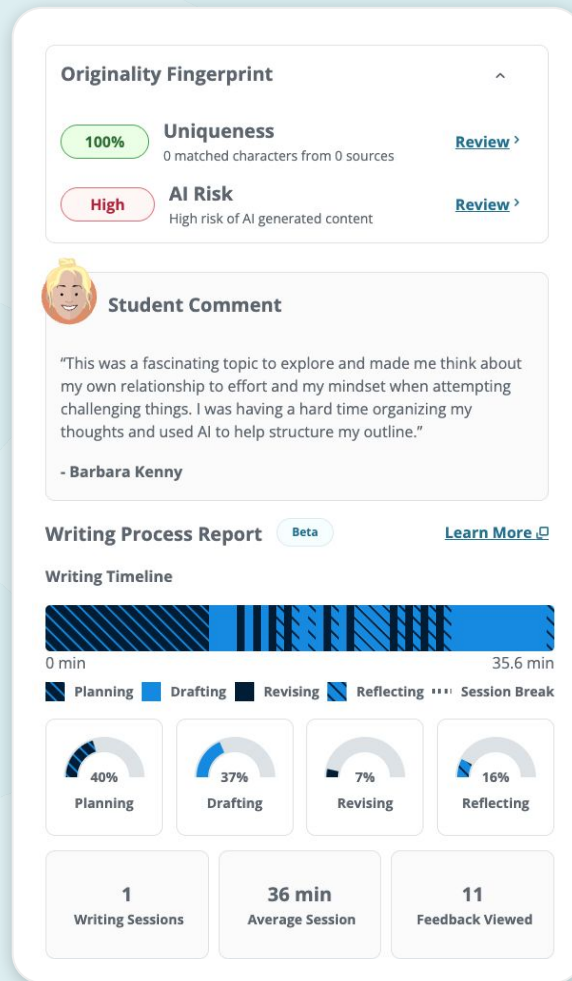
*It's how to preserve  
deep learning*



# From Surveillance to Insight

*"I had a student get flagged for AI this afternoon and with the insights **I could actually see that I don't think it's a concern because given how she was spending her time.** I can see she was probably using AI but it wasn't just like "I'm gonna have AI write this essay for me" like she clearly wrote it and had AI for help, and so it makes it a much easier conversation to have. I emailed the student and I said, your essay got flagged for AI. Here's the insights that I'm seeing, and so I'm not really concerned about this, but if you want to talk, we can talk and so **having that conversation a lot easier.**"*

*—Professor Barton, University of Alabama*



# Not a fix, a flashlight



## Engagement Insights is NOT...

- A shortcut to self-regulated learning
- A cure for the experienced vs. actual learning paradox
- A guarantee of producing *productive effort*
- A mechanism to eliminate AI use



## Engagement Insights DOES

- Makes the learning process visible
- Surfaces patterns that would otherwise stay hidden
- Creates shared context for coaching conversations
- Transforms process into an artifact students can reflect on
- Reduces suspicion by inviting transparency and dialogue

# Quick Wins

Strategy	Intended Outcome	Example
<b>Productive Friction</b>	<i>Pause</i> the moment of offload	1-minute voice note of initial, unassisted thinking or goal setting.
<b>Productive Friction</b>	<i>Stretch</i> the curiosity gap	<b>3-2-1 Exploration Ticket</b> <i>before</i> instruction: <ul style="list-style-type: none"><li>• 3 initial ideas or ways they approached the problem</li><li>• 2 new questions that surfaced while exploring</li><li>• 1 misconception, false start, or failed attempt and what it revealed</li></ul>
<b>Open Transparency &amp; Reflection</b>	<i>Strengthen</i> the noticing muscle	<b>Close Read &amp; Compare</b> Students analyze an AI summary alongside the source text, identifying the subtle meanings, tensions, and contextual details the summary compresses or omits.
<b>Open Transparency &amp; Reflection</b>	<i>Surface</i> the decision path	<b>Judgement Recall</b> Ask: "There was probably at least one point where you {rejected what AI gave you}. What made you trust your judgment in that moment?"
<b>Reinforcing the Struggle</b>	<i>Elevate</i> mistakes as artifacts	<b>Comparative Thesis Workshop</b> Display a few student thesis statements or draft excerpts and invite students to analyze strengths, gaps in reasoning, and evidentiary breakdowns so developing ideas, not polished products, become the shared object of inquiry.

# Wrapping Up

# Packback Labs

<https://labs.packback.co>

## AI Co-Authored Essay

Students build their draft with AI in stages, responding to planning prompts and choosing to keep, tweak, or discard the AI's suggestions paragraph by paragraph.

**Instructors see a visual timeline that traces the student's path, highlighting exactly where they accepted the AI's help and where they stepped in to make changes.**

## Teach the AI

In this reverse-tutoring simulation, students guide a naive AI through a topic, correcting its generated misconceptions along the way. The AI is then assessed based strictly on that dialogue.

**Instructors receive a summary of how well the AI passed a final quiz based on the student's tutoring, serving as a direct proxy for the student's own mastery.**

## AI First Draft

Students start with the same AI-generated draft. They identify gaps for research and revise the text to strengthen their own authorial voice.

**Instructors receive a visual snapshot showing exactly how far each student's work evolved away from the original AI text.**

## Both Sides

Students engage in a two-round debate with an AI, arguing first for a motion and then against it.

**Instructors are presented with a consolidated view that pairs the transcript of their 'side-switching' performance directly with their self-reflection, making it easy to spot moments of insight.**

# Our Highest Intention For This Webinar Series

## Our Intention

Our goal isn't to tell you what to think about AI—it's to give you a foundation for making your own intentional, evidence-based decisions about how to use it.

- To **replace hype and fear with understanding**
- To **build a shared mental model** for talking about AI in education
- To **equip instructors and leaders** with language, frameworks, and practical tools
- To **reclaim the human center** of teaching and learning in an AI-rich world

## The Series

Each of these webinars will stand alone, but together paint a cohesive picture of the role of AI in education

- Part 1: What Educators Get Wrong About AI (And How to Get It Right)
- Part 2: Teaching with Integrity: Building an Ethical AI Strategy for Education
- Part 3: Designing for Engagement and Mastery
- Part 4: Supporting Original Thinking: Creating the conditions for productive struggle
- **Part 5: Education for the Future: Building AI Literacy and Lifelong Learning Skills**

# Save Your Seat For Part 5!

## Live Panel: Preparing Education for the Age of AI

 Wednesday, March 25th @ 12pm CT

This live panel explores how teaching is evolving in the age of AI. You'll hear a candid discussion on redesigning courses to strengthen critical thinking, collaboration, creativity, and communication in AI-enabled classrooms.

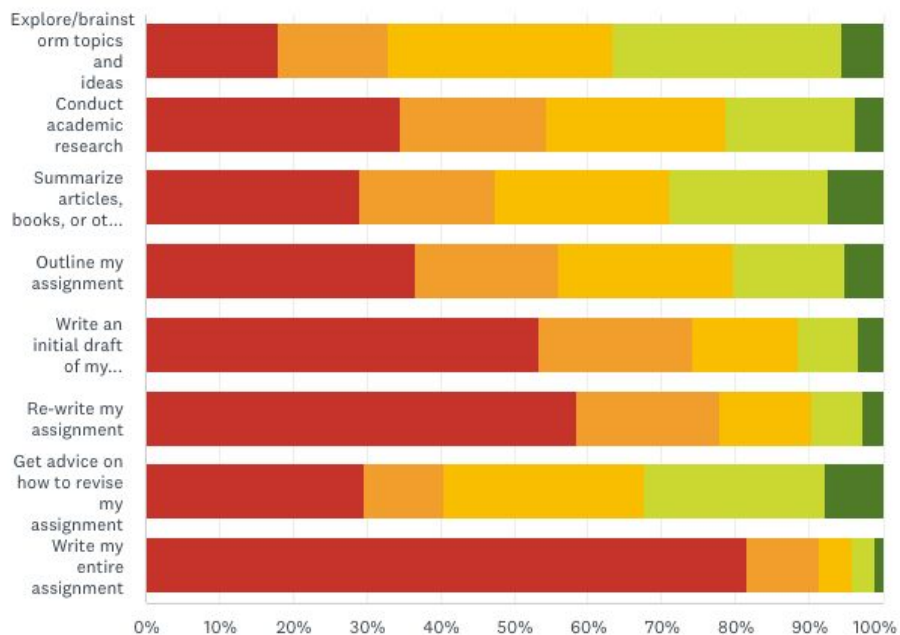
**RSVP with the QR code, the link in chat, or check the follow-up email!**



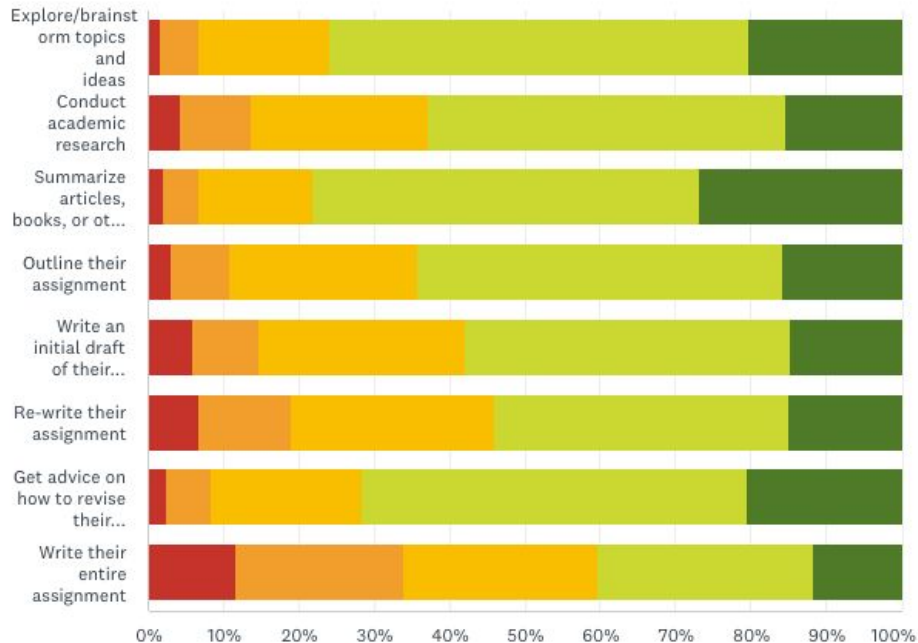


# Q&A

# Comparison Self vs Peers



■ Never
 ■ Rarely
 ■ Sometimes
 ■ Often
 ■ Always



■ Never
 ■ Rarely
 ■ Sometimes
 ■ Often
 ■ Always