

Unlocking the Power of Artificial Intelligence: A Playbook for Educators and Students

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What informs my perspective 🧐?

I'm an engineering educator with 100+ person classes 🏫

I'm a father of three girls in grade school 👧👧👧

My strengths: 1. Learner 📖, 2. Maximizer ⏳, & 3. Positivity +


I'm white, male, heterosexual, able-bodied, and super-tall 📱

I was born in 1977, so I am a Gen X / Millennial hybrid 📅

I tend to be an early-majority adopter 🔔

How many of you are already using artificial intelligence? Stand and stay up if you have...

Used ChatGPT 

Talked to your Alexa, Siri, or Hey Google 

Logged on your phone  with face recognition

Used a map application to navigate 

Watched recommended shows on Netflix 

Browsed your feed on social media 

Terminology

Artificial intelligence (AI): algorithms capable of understanding and generating responses as learning from vast datasets to demonstrate understanding in specific domains

Generative artificial intelligence (GenAI): AI technologies that can generate text, images, music, and computer code based on the patterns and information they have learned from vast datasets.

Large Language Models (LLMs): Artificial intelligence algorithms trained on extensive datasets to understand, generate, and interact with human language in a contextually relevant manner



Write me a high school economics lesson based on the success of the Volkswagen Beetle

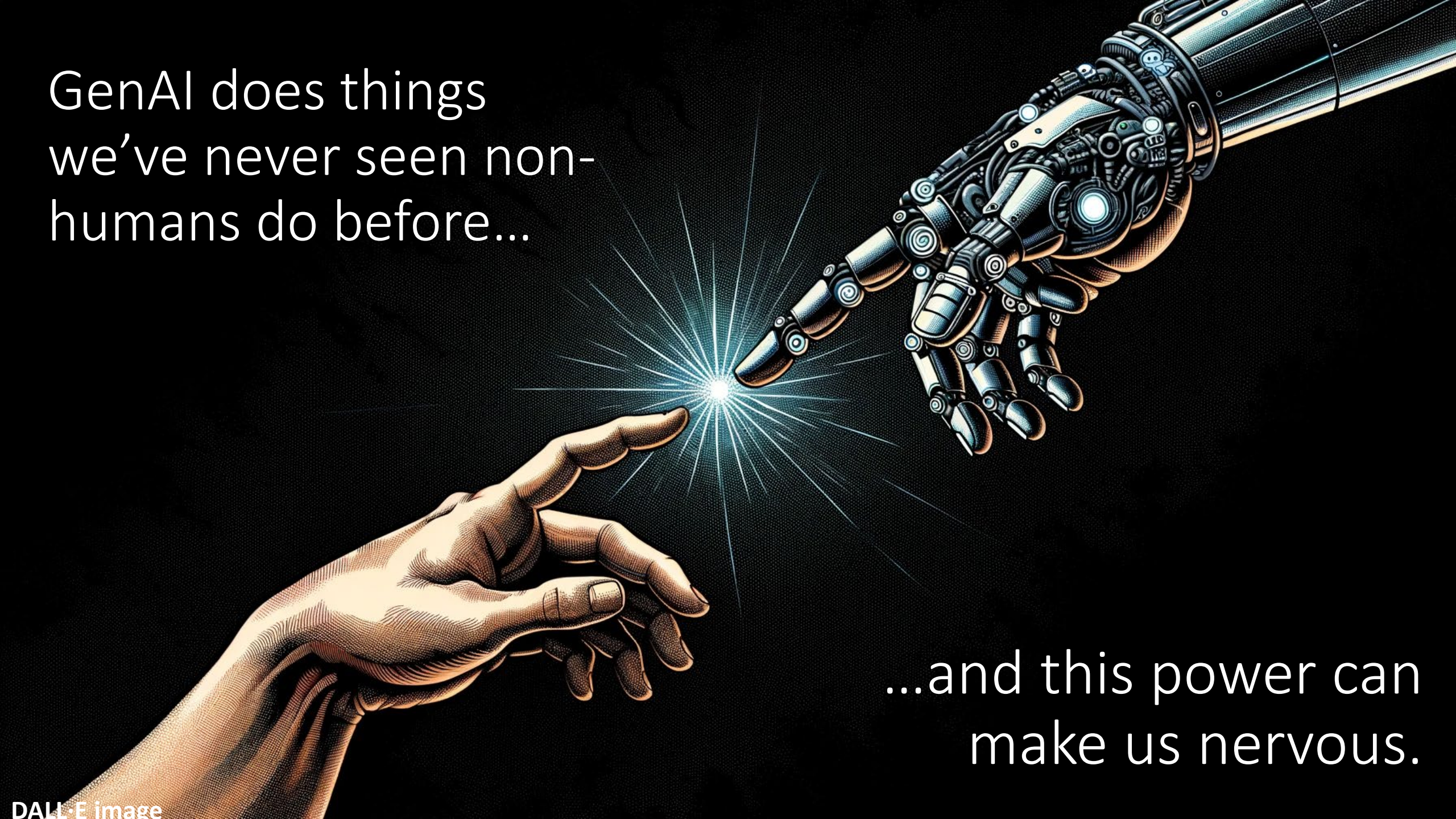
Another way to think
about LLMs:

Large
Language
Models are
calculators
for words



DALL·E image edited by Dan Baker

GenAI does things
we've never seen non-
humans do before...



...and this power can
make us nervous.



and
create
infinite
possibilities!

Activity 1: Pairs of 2, 1-min each

1. Introduce yourself to your neighbor
2. Answer: *What is the most tedious part of your work?*

Person 1

Person 2

GenAI Playbook for Teachers and Staff

Draft content

Summarize text

Draft lesson plans

Find & connect information



DALL·E image

Draft Letters of Recommendation

DA

Draft a recommendation letter for a student who is smart but lazy, rarely comes to class, but does B level work on exams.

To Whom It May Concern,

I am writing to recommend [Student's Name] based on my interactions with them as an engineering teacher at Colorado State University. [Student's Name] has demonstrated a unique blend of intelligence and a penchant for independent study that I believe is worth highlighting.

While [Student's Name] may not be a regular attendee in class, their performance on exams consistently showcases their intellectual capabilities. It's evident that they possess a keen grasp of the subject matter and are capable of achieving B-level work when they apply themselves. In fact, their exam results often exceed my expectations, reinforcing their potential in the field.

Text or Meeting Summary

I had a 1.5-hour Zoom meeting on Tuesday with my textbook co-author and used Tactiq to take notes

Short summary

During the meeting, Dan and William discussed updates and potential improvements to the textbook, including restructuring Chapter 4 to better present the concept of moments and the use of cross-products. They also considered the integration of additional learning resources, such as Dan's instructional videos, and discussed creating a landing page to enhance accessibility to various book-related materials. Lastly, they discussed making minor edits directly in the main branch using Code Spaces, building, and deploying the new version of the book.

Action Items - Top 5

   Copy  Delete

1. Dan will finalize the "moment about a line" example and ensure it is up to the required standard before syncing it with the main branch of the textbook.
2. William will review and potentially restructure the introductory sections of Chapter 4 to improve the organization and presentation of topics such as moments, torque, and cross products.
3. Both parties will consider the best approach to merging changes, with the possibility of creating separate branches for different topics and using pull requests to keep the main branch updated.
4. The team will explore ways to incorporate Dan's video resources into the textbook, possibly through a landing page or directly within the book, leveraging Dan's authorship and expertise.
5. They will address the permalink issue by potentially using labels for sections to create more stable and persistent links, ensuring that references to sections remain consistent even after updates and renumbering.

Lesson Plans: Brainstorming

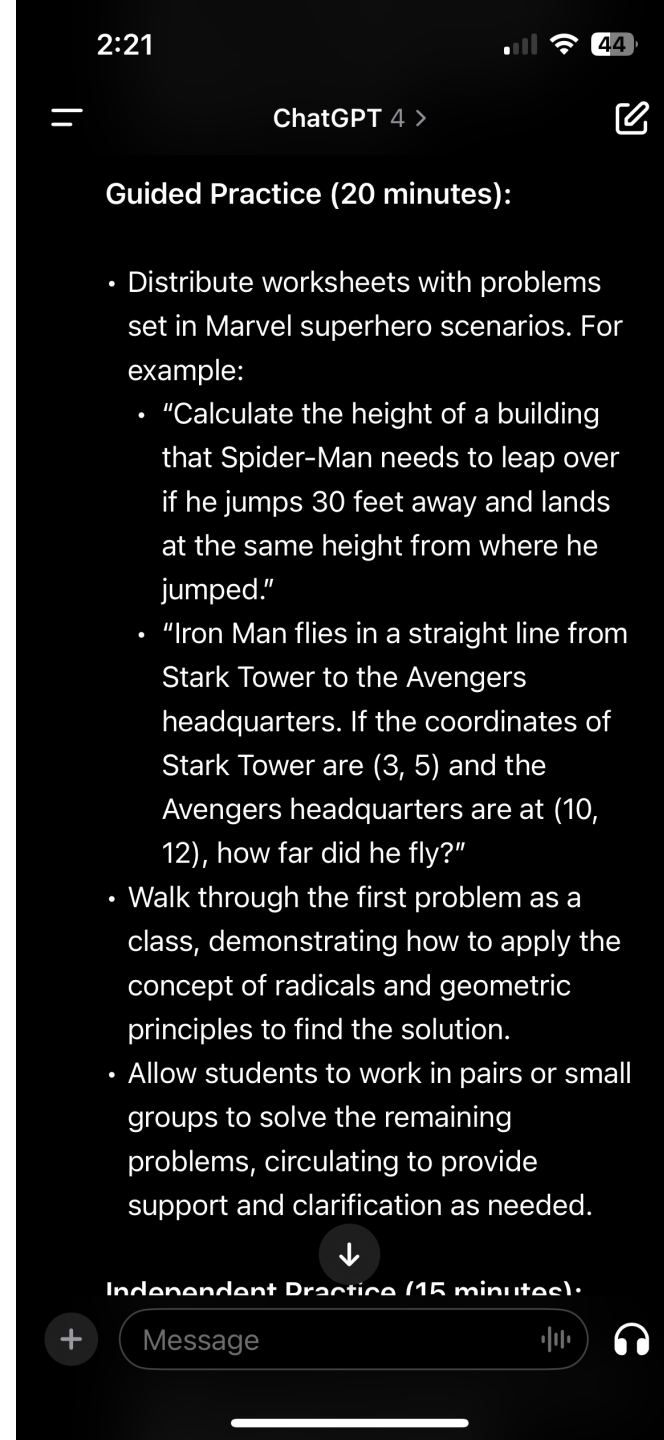
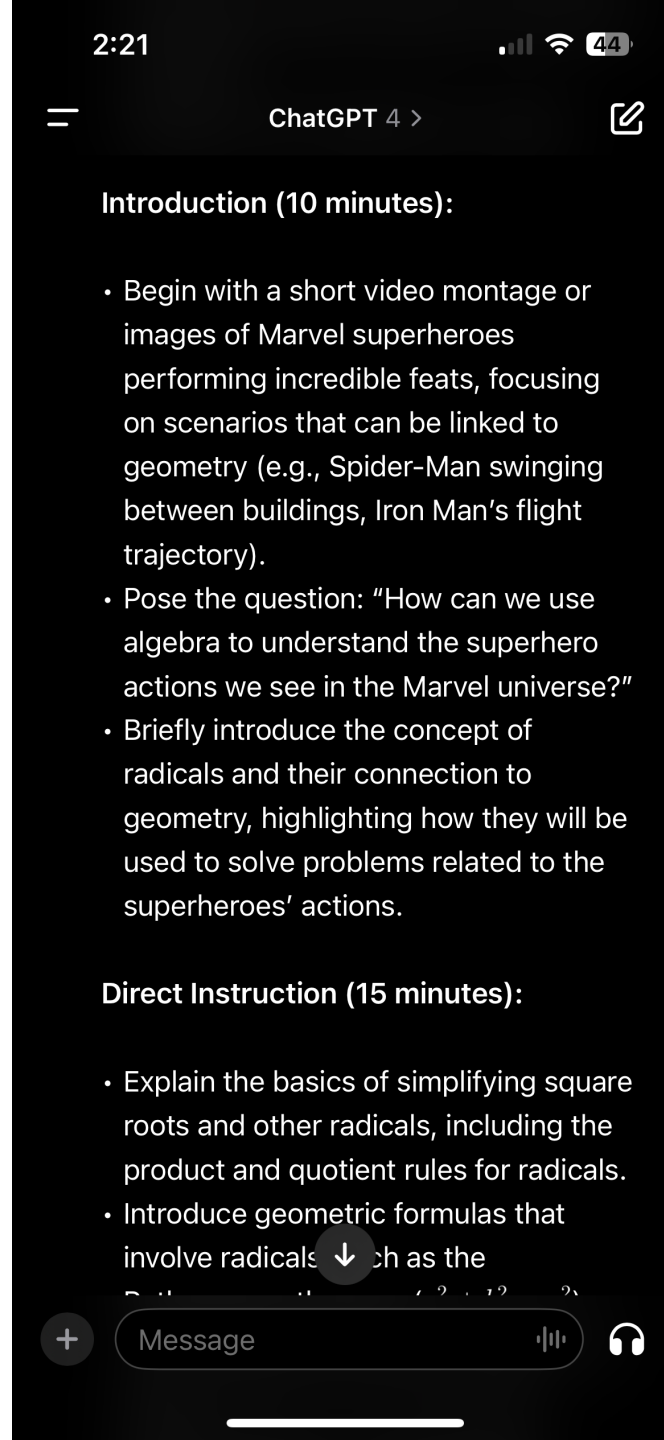
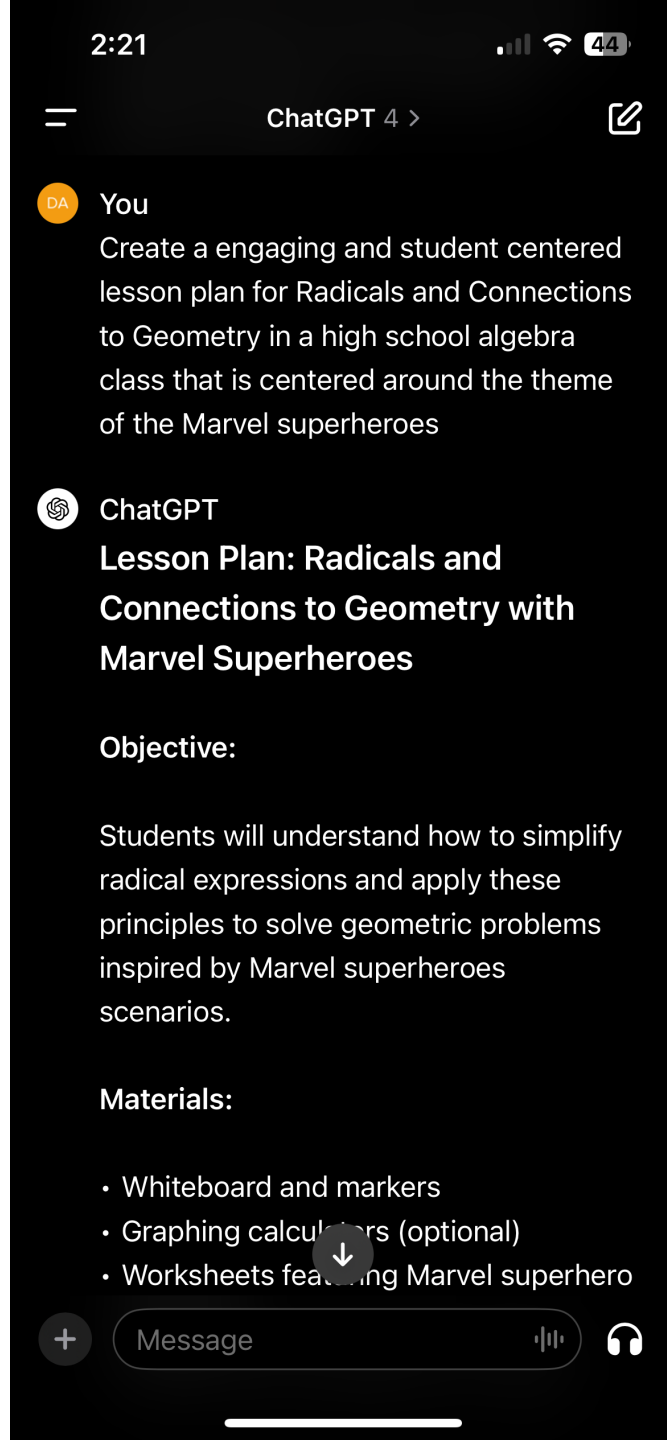
DA

What are 10 ways I can incentivize students to complete low stakes assignments?

Certainly! Encouraging students to complete low-stakes assignments can be achieved through various strategies. Here are ten ways to incentivize them, using real-world analogies:

1. **Gamification:** Treat assignments like a game, with points, badges, and rewards. Just as completing levels in a video game is rewarding, students can earn points for completing assignments.
2. **Progress Bars:** Visualize their progress, similar to tracking steps on a fitness app. As they complete assignments, they can see themselves getting closer to a goal.
3. **Peer Recognition:** Create a "Wall of Fame" or an online platform where students can showcase their completed assignments, akin to social media likes and comments.
4. **Competition:** Host friendly competitions with small prizes for those who consistently complete assignments. This mirrors the motivation in sports to outperform peers.
5. **Real-world Application:** Show students how these assignments connect to their future careers, just as athletes follow rigorous training to succeed in their sport.

Lesson Plans: Customization



Finding New Information

DA

You

I'm helping a student who wants to study engineering at Colorado State University decide what math classes to take in high school. What should I tell them?



ChatGPT

For a student aspiring to study engineering at Colorado State University (CSU), taking a strong set of math classes in high school is crucial for building a solid foundation. Here's what you should recommend:

1. **Algebra 1 and 2:** Essential for developing basic algebraic skills and understanding functions, variables, and equations, which are fundamental in all areas of engineering.
2. **Geometry:** Important for grasping spatial concepts and properties of shapes, beneficial for fields like civil, mechanical, and aerospace engineering.
3. **Trigonometry:** Key for understanding relationships between the sides and angles of triangles, which is crucial in many engineering fields for analyzing forces, designing components, and more.
4. **Pre-Calculus:** Prepares students for college-level calculus by introducing concepts such as limits, sequences, and series, and reinforces trigonometry and algebra.
5. **Calculus:** Ideally, both Calculus AB and BC if available, as calculus is central to engineering for modeling and solving real-world problems.

So, where should you start?

Try

Fail

Learn

Repeat

Now let's focus on your students

Think of GenAI as *tools for your students' future*



Exposed them to the possibilities and have them use GenAI in your courses



Stress that AI does not think but is a tool for exploration and understanding.

GenAI Student Playbook

Gather & clarify information

Generate ideas

Structure & improve writing

Find gaps in logic

Prepare for interviews & debates



DALL·E image

Gather and explain information

While LLMs are knowledgeable, always cross-reference facts

Use LLMs with website search

Prompts:

Provide a comprehensive overview of TOPIC and its primary principles
Cross-reference the key advantages of TOPIC with reputable scientific sources.



Customize the level of information

Rewrite the following text in simpler language “_____”

Provide 5 real-world examples of when _____ is used.

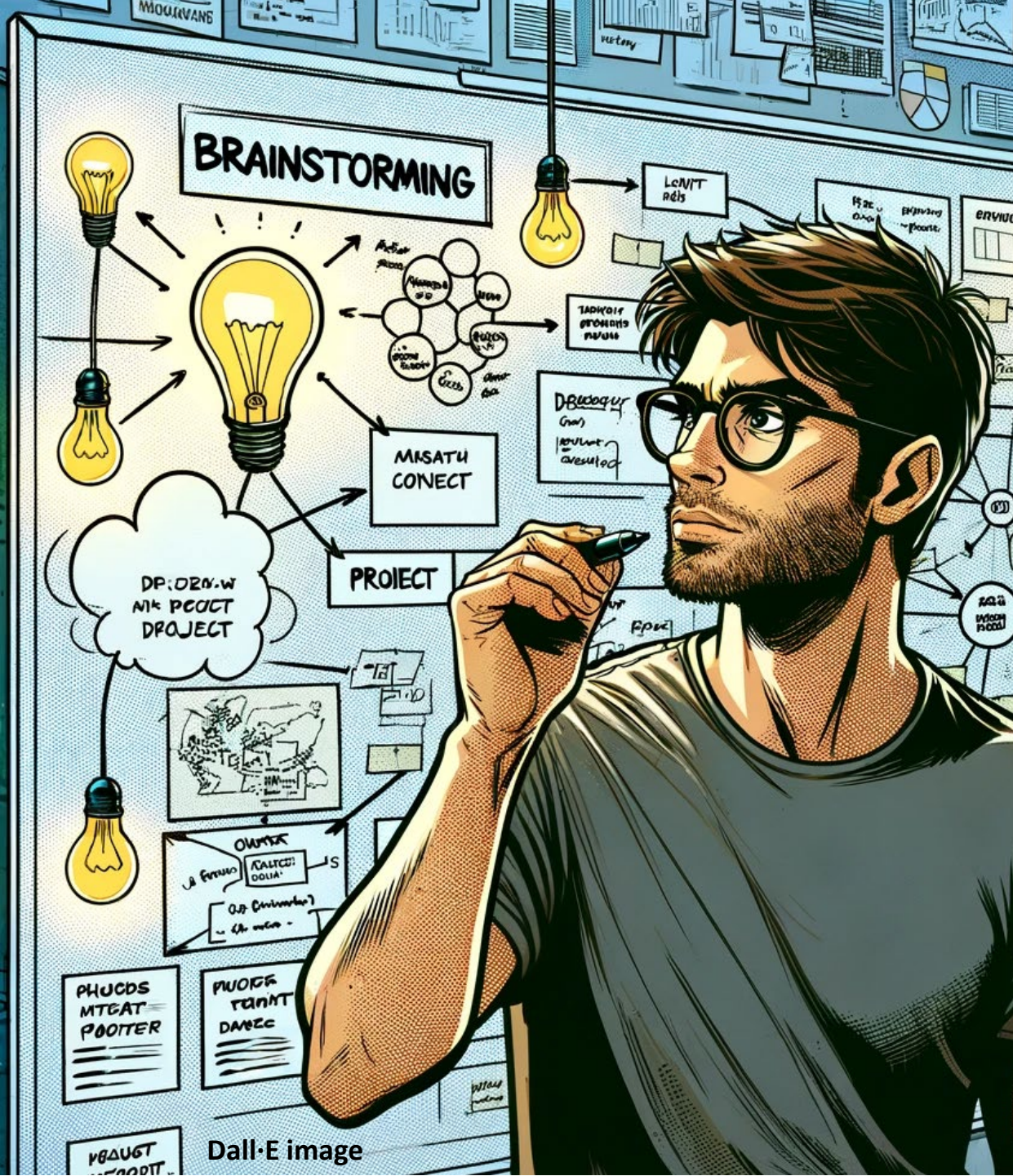
How would I use the concept of _____ in engineering school.

When can't we make the assumption of _____.

Simplify



Complicate



Generate ideas

If students are stuck have them generate ideas as starting points

Prompts:

Develop 5 hypotheses for TOPIC based on current scientific understanding

What are 10 creative ways to apply TOPIC to FIELD

I am a NUMBER grade student writing a paper on TOPIC. Generate 10 topics for my paper.

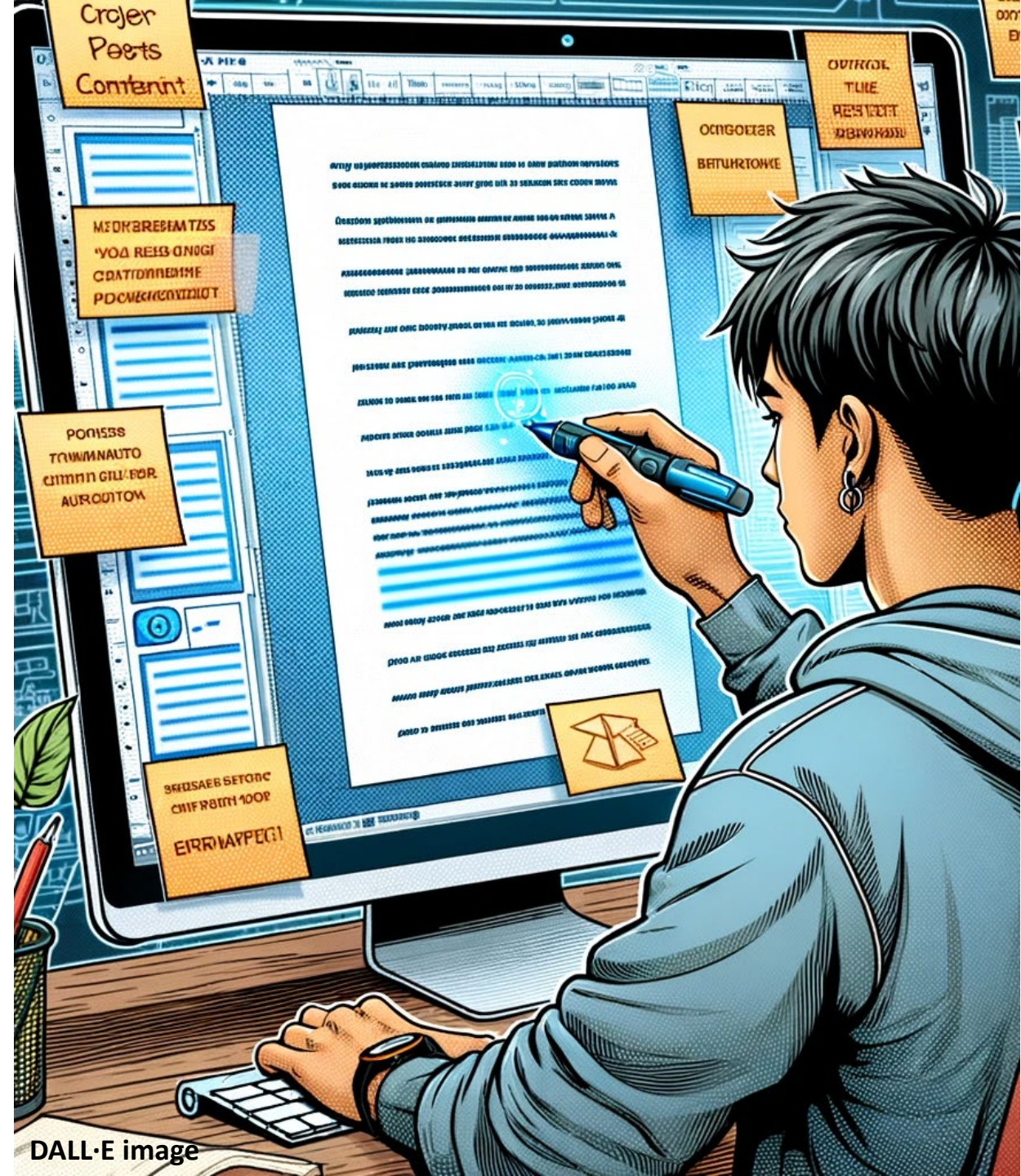
Structure and improve writing

Clarify expectations on which steps in the process can be AI-assisted and which cannot

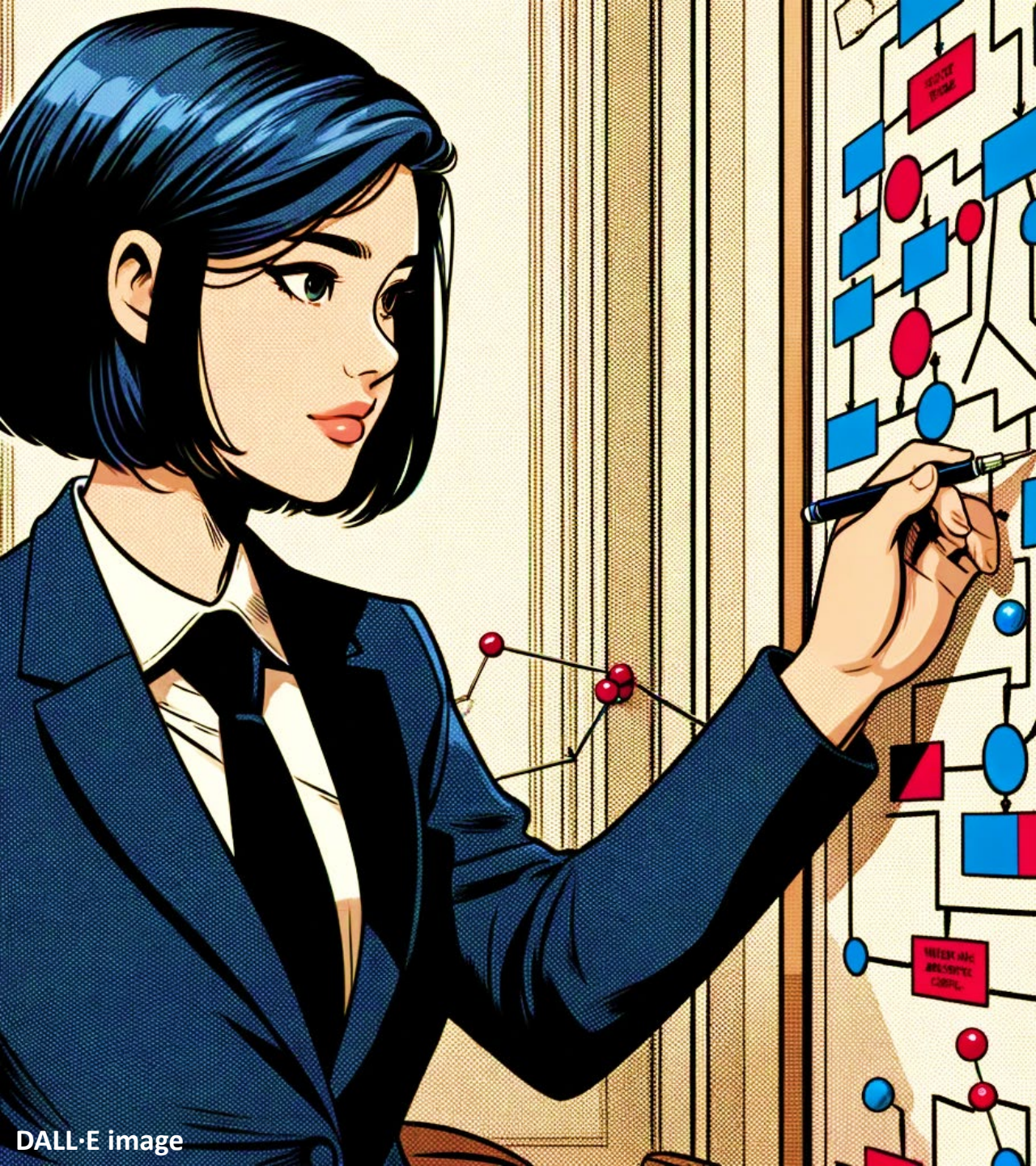
Prompts:

Provide an outline for a 5-page technical report on TOPIC.

Provide 3 options to make the following statement more succinct.
"STATEMENT"



DALL·E image



Find gaps in logic

Unlike our human minds that are anchored to our experiences, ChatGPT will take any angle you ask

Prompts:

You are a forensic investigator, name 10 ways this IDEA could fail

You are an expert in FIELD, provide 5 probing questions to IDEA

What are the 5 most common errors when computing TOPIC?

Prepare for interviews or debates

Quickly set up an interactive interview and get feedback on your responses.

Prompts:

What are some interview questions I might be asked for this JOB TITLE?

You are a hiring manager at BUSINESS. Ask me questions about JOB. After I provide answers, give me feedback on the strengths and weaknesses of my answers.



ChatGPT Custom Instructions for Students

"Please provide explanations and insights that guide me toward finding the solution myself, rather than giving direct answers."

"If you're helping me with a specific problem, focus on explaining the methodology and underlying concepts, rather than solving the problem for me."

"When discussing academic texts or theories, summarize the main points and guide me on how to critically analyze the material, rather than interpreting it for me."

"If you provide information that could answer a homework question or assignment, remind me to paraphrase and cite the source."

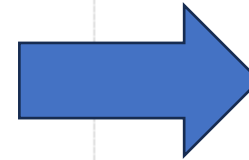
What would you like ChatGPT to know about you to provide better responses?

I am a high school student who is hoping to study Engineering in college. I like practical and visual examples.

111/1500

Hide tips 

How would you like ChatGPT to respond?



0/1500

Enable for new chats

Cancel

Save

Ethical Use



Emphasize the importance of not using it for plagiarism.



It is easy, so the temptation is high to use generated content as your own.



Remind students that while LLMs can help them understand or explore topics, true learning comes from grappling with challenges and internalizing knowledge.



Remind students of the importance of producing original work and not relying solely on LLM-generated content.



Provide clear guidelines on when and how to use LLMs, especially in assignments and research.

Clear is kind. Unclear is unkind.

We must be clear with our students about the power and pitfalls of using GenAI.

It is our responsibility as educators to clearly outline *how* and *when* GenAI can be used.

GenAI can be part of the solution to better prepare our students for a rapidly developing future.



Natural Language Tool	Pros	Cons
OpenAI ChatGPT GPT3.5 https://chat.openai.com/	<ul style="list-style-type: none"> • Free • Custom instructions available • Good code translator 	<ul style="list-style-type: none"> • Less functionality than GPT4.0 • No access to internet • Lacks customized options
OpenAI ChatGPT+ GPT4.0 https://chat.openai.com/	<ul style="list-style-type: none"> • Custom instructions available • Improved Factual Performance over GPT3.5 • Includes access to DALLE-3 • Allows image, data input • Excellent code translator 	<ul style="list-style-type: none"> • Costs \$20/month
CoPilot (Bing) AI https://www.bing.com/search?q=Bing+AI&showconv=1	<ul style="list-style-type: none"> • Free • Accesses internet • Provides access to GPT4.0 in Creative Mode • Includes access to DALLE-3 	<ul style="list-style-type: none"> • No conversation history • Lacks customized options
Google Gemini (Bard) https://gemini.google.com/app	<ul style="list-style-type: none"> • Free • Ethical and transparent AI development approach • Accesses internet • Integrates with Gmail, Google Calendar, etc 	<ul style="list-style-type: none"> • Lacks customized options
Anthropic Claude https://claude.ai/	<ul style="list-style-type: none"> • Free • Higher user engagement and feedback. • Detailed and easily understood answers. 	<ul style="list-style-type: none"> • No conversation history • Lacks customized options
Perplexity https://www.perplexity.ai/	<ul style="list-style-type: none"> • Free • resource for students, researchers, and anyone seeking precise answers supported by citations 	<ul style="list-style-type: none"> • Lacks customized options

Image genAI Tools

Tool	Pros	Cons
DALL·E 3 In Bing AI and ChatGPT+	<ul style="list-style-type: none">• Free and easy to access• High-quality images 2-4 at a time	<ul style="list-style-type: none">• Revisions create new images instead of just editing old
Adobe Firefly https://firefly.adobe.com/	<ul style="list-style-type: none">• Awesome generative fill and text effects• Novel text effects and regenerative color	<ul style="list-style-type: none">• Text to image is not as precise as DALL·E-3
MidJourney https://www.midjourney.com/home	<ul style="list-style-type: none">• Must access via Discord• High quality images	<ul style="list-style-type: none">• Only paid plans starting at \$10/month
Recraft Vector & Raster Images https://app.recraft.ai/	<ul style="list-style-type: none">• Create an artboard of images using a color palette• Can export as editable SVG	<ul style="list-style-type: none">• Inaccurate spelling

and too many more to list!

Recommended AI in education resources:

Videos to share with colleagues and students

[Wharton Interactive Crash Course: Practical AI for Instructors and Students](#)

Prompt Libraries

[Prompt Library — AI for Education](#)

[microsoft/prompts-for-edu](#)

[Assigning AI: Seven Approaches for Students with Prompts - Ethan & Lilach Mollick, UPenn](#)

Training

[Generative AI Prompt Literacy - Michigan Office of Online and Digital Education](#)

[Empower educators to explore the potential of artificial intelligence - Training | Microsoft Learn](#)

AI in education social media channels

<https://www.linkedin.com/in/conorgrennan/> or <https://twitter.com/conorgrennan>

<https://www.linkedin.com/in/emollick/> or <https://twitter.com/emollick>

<https://www.linkedin.com/in/leonfurze/>

<https://www.linkedin.com/in/jason-gulya/> or <https://twitter.com/jasongulya>

<https://www.linkedin.com/in/jaeden-schafer/> or https://twitter.com/jaeden_ai

<https://www.linkedin.com/in/rob-lennon/> or <https://twitter.com/thatroblennon>

<https://www.linkedin.com/in/theaieducator/> or <https://twitter.com/theaieducatorx/>

Activity 2 (5 min):

1. Individually or in groups of 2, use CoPilot, ChatGPT, or Gemini to brainstorm 10 solutions to the pain points you identified in Activity 1.
 1. “How can I use AI to _____?”
2. Count the number of solutions that are
 - Already known
 - Invalid or useless
 - Novel and useful
3. Discuss your findings with your neighbor

Q&A and Discussion

What questions do you have?

What generative artificial intelligence (GenAI) tasks are you now going to try?

Feel free to follow up and connect:

Dan.Baker@colostate.edu

@drdanteaches on



Stock image from Microsoft

