



Leveraging AI in Adult Education

An overview of Generative AI and Practical Applications

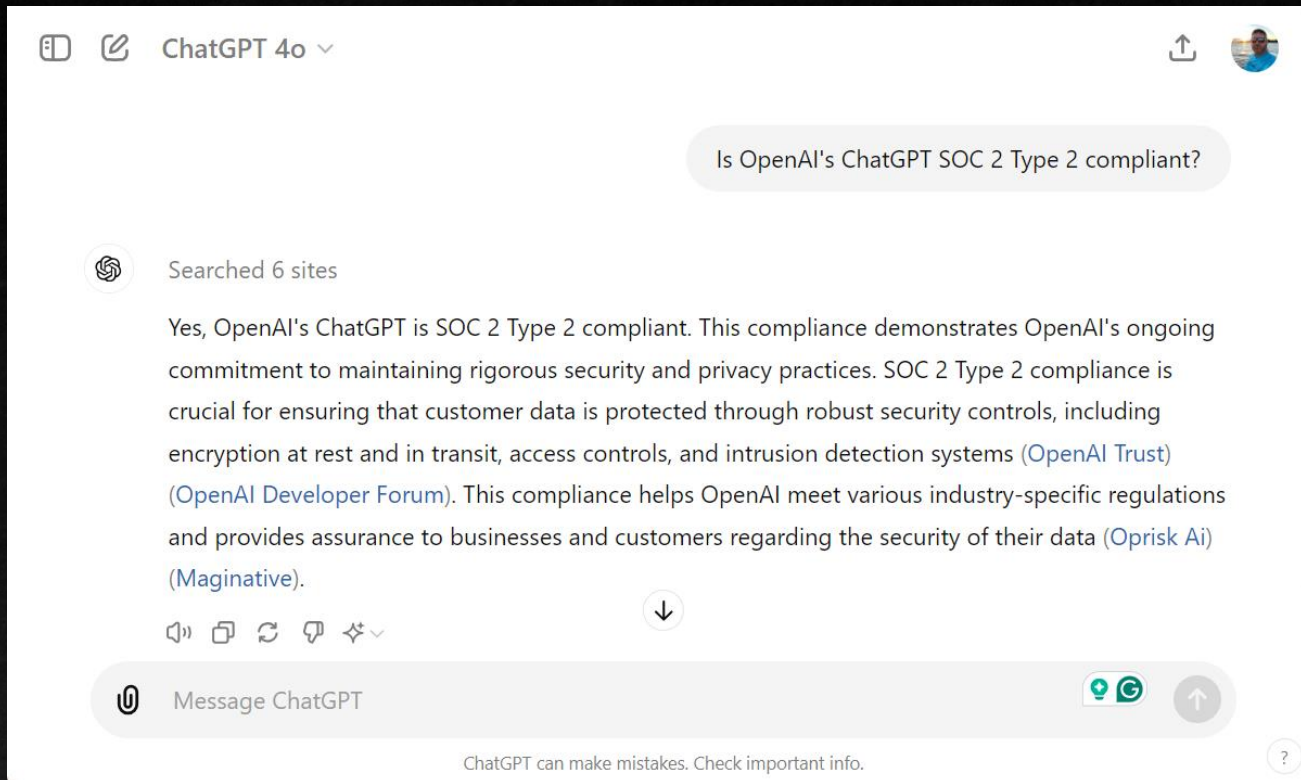


Dr. Lane Freeman



Dr. Lane Freeman
Director of Online Learning
NC Community College System

AI and Security Guidelines



The screenshot shows a chat window for ChatGPT 4o. The user's question is "Is OpenAI's ChatGPT SOC 2 Type 2 compliant?". The AI's response states that it has searched 6 sites and confirms that OpenAI's ChatGPT is SOC 2 Type 2 compliant. The response includes links to "OpenAI Trust", "OpenAI Developer Forum", "Oprisk Ai", and "Maginative". At the bottom, there is a disclaimer: "ChatGPT can make mistakes. Check important info."

ChatGPT 4o

Is OpenAI's ChatGPT SOC 2 Type 2 compliant?

Searched 6 sites

Yes, OpenAI's ChatGPT is SOC 2 Type 2 compliant. This compliance demonstrates OpenAI's ongoing commitment to maintaining rigorous security and privacy practices. SOC 2 Type 2 compliance is crucial for ensuring that customer data is protected through robust security controls, including encryption at rest and in transit, access controls, and intrusion detection systems ([OpenAI Trust](#)) ([OpenAI Developer Forum](#)). This compliance helps OpenAI meet various industry-specific regulations and provides assurance to businesses and customers regarding the security of their data ([Oprisk Ai](#)) ([Maginative](#)).

Message ChatGPT

ChatGPT can make mistakes. Check important info.

At the NC System Office, we understand the need to strike a balance between ensuring the safety of our artificial intelligence tools and meeting the productivity requirements of our staff. We encourage verifying AI tools are compliant with **SOC 2 Type 2** standards.

In addition, it is crucial to maintain that any information considered to be private must not be shared through these platforms.

Identify Themes using a LLM

The KWLA instructional strategy, also known as "Know, Want to Know, Learned, and Applied," is a framework used in education to guide students through learning and reflecting on a topic or lesson.

K-W-L-A

Prompt: In my professional development session, I asked participants to complete the first part of a KWLA (Know and Want to Know). Provide a summary of the three themes that emerged as participants shared what they know and what they want to know. Include one quote from a participant as an example of what some participants already know, and one quote to provide an example of what some want to know.

Prompt: I want to send an email to this group of participants that summarizes these themes using the names of the participants shared above. Write this email in less than 400 words

Quickwrite: Note-Taking Experience

Quickwrite:

Is note-taking an important skill in higher education? If so, do most of our students know how to take notes effectively?

(A "quickwrite" is a brief, timed writing activity where participants jot down their thoughts or responses to a prompt or question in a few minutes, encouraging spontaneous and thoughtful engagement. There is no judgment on grammar or spelling.)

Encourage Note-Taking by Using AI

Session Notes – AI in Education

Essential Question: How can we leverage Language Models (LLMs) to innovate teaching methods, enhance administrative efficiency, and foster student development while maintaining ethical considerations in education?

What & How? <small>Content, Strategies, Tools, Resources</small>	Why? <small>Purpose and Intent</small>	Applications <small>Classroom or Department</small>
SLANT <small>Sit up, Listen, Ask questions, Nod, Track or Technology Management</small>	Establishing norms and expectations before a lecture is a pivotal step in fostering an environment conducive to learning and engagement. It is a way to "snap" students into a learning posture.	Incorporate a SLANT slide at the beginning of all presentations and call out "SLANT" as you notice
Community Builder – <small>Uncommon Commonalities</small>	<ul style="list-style-type: none"> Fosters a network of support for sharing insights and experiences. Creates a space where every voice is valued and respected. Encourages active participation and deeper understanding through collaboration. Leverages community as a foundation for collective growth and learning. 	Incorporate this activity on the first day of class to build a welcoming environment.
KWLA	The KWLA instructional strategy, also known as "Know, Want to Know, Learned, and Applied," is a framework often used in education to guide students through the process of learning and reflecting on a topic or lesson. It is a modification of the KWL (Know, Want to Know, and Learned) strategy with the addition of "Applied."	

KWLA

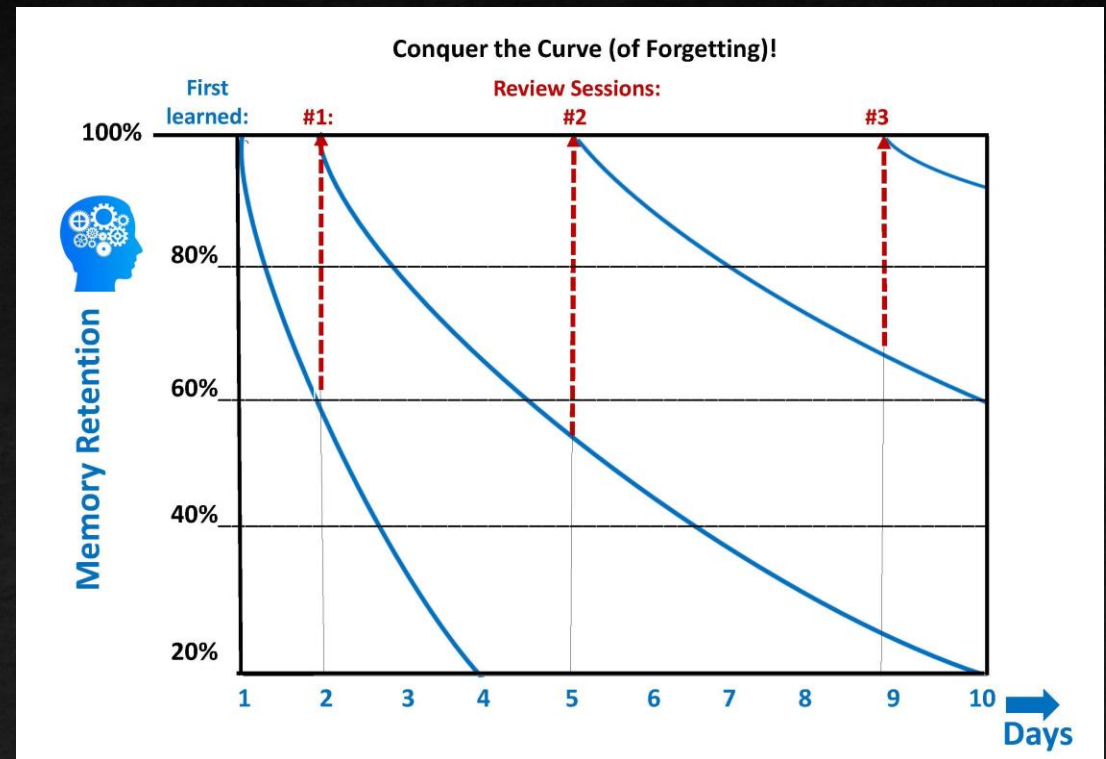
The KWLA instructional strategy, also known as "Know, Want to Know, Learned, and Applied," is a framework often used in education to guide students through the process of learning and reflecting on a topic or lesson. It is a modification of the KWL (Know, Want to Know, and Learned) strategy with the addition of "Applied."

Summarize: Explain how these three strategies can set the stage for an engaging classroom:

Prompt Practice: Write a prompt that asks ChatGPT to ask how to use a KWLA in your specific class:

The WHY Behind Note-Taking

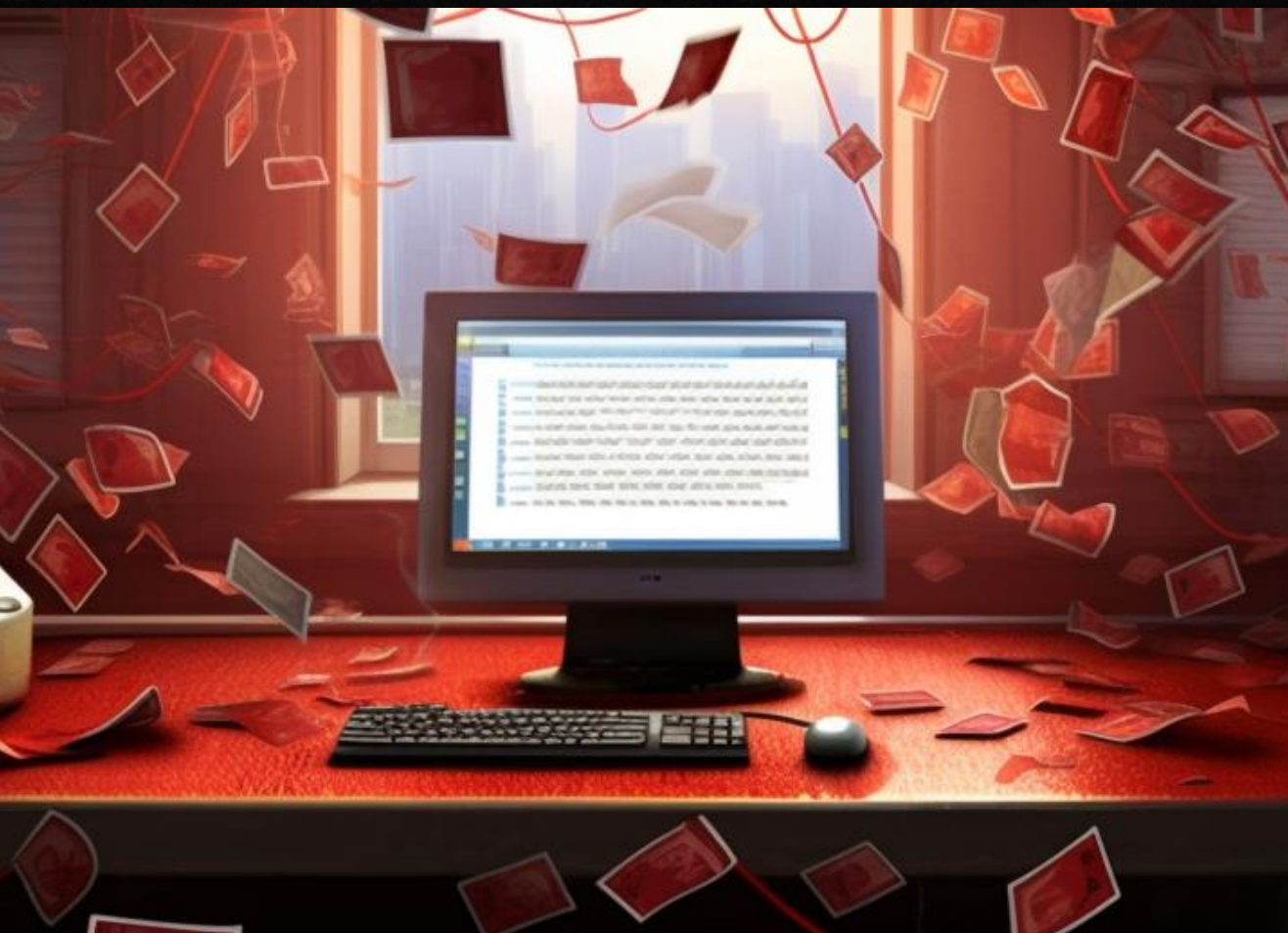
- We know “Exam Cram” doesn’t work.
- The forgetting curve shows how much information we forget over time if we do not actively review it.
- The curve is steepest immediately after learning, and then the rate of forgetting slows down over time.
- Taking notes during a college class can help combat the forgetting curve by:
 - Forcing us to actively engage with the material.
 - Providing us with a record of the material that we can review later.
 - Helping us to identify and understand the key points of the material.





LLMs: A Reverse Engineering Approach

- Reverse Engineering LLMs
- Metacognitive Approach to LLMs
- Integration into the Educational Landscape



The Evolution of AI to LLMs

Rule-based System: Earlier forms of AI relied on specific rules and logic, providing deterministic responses.

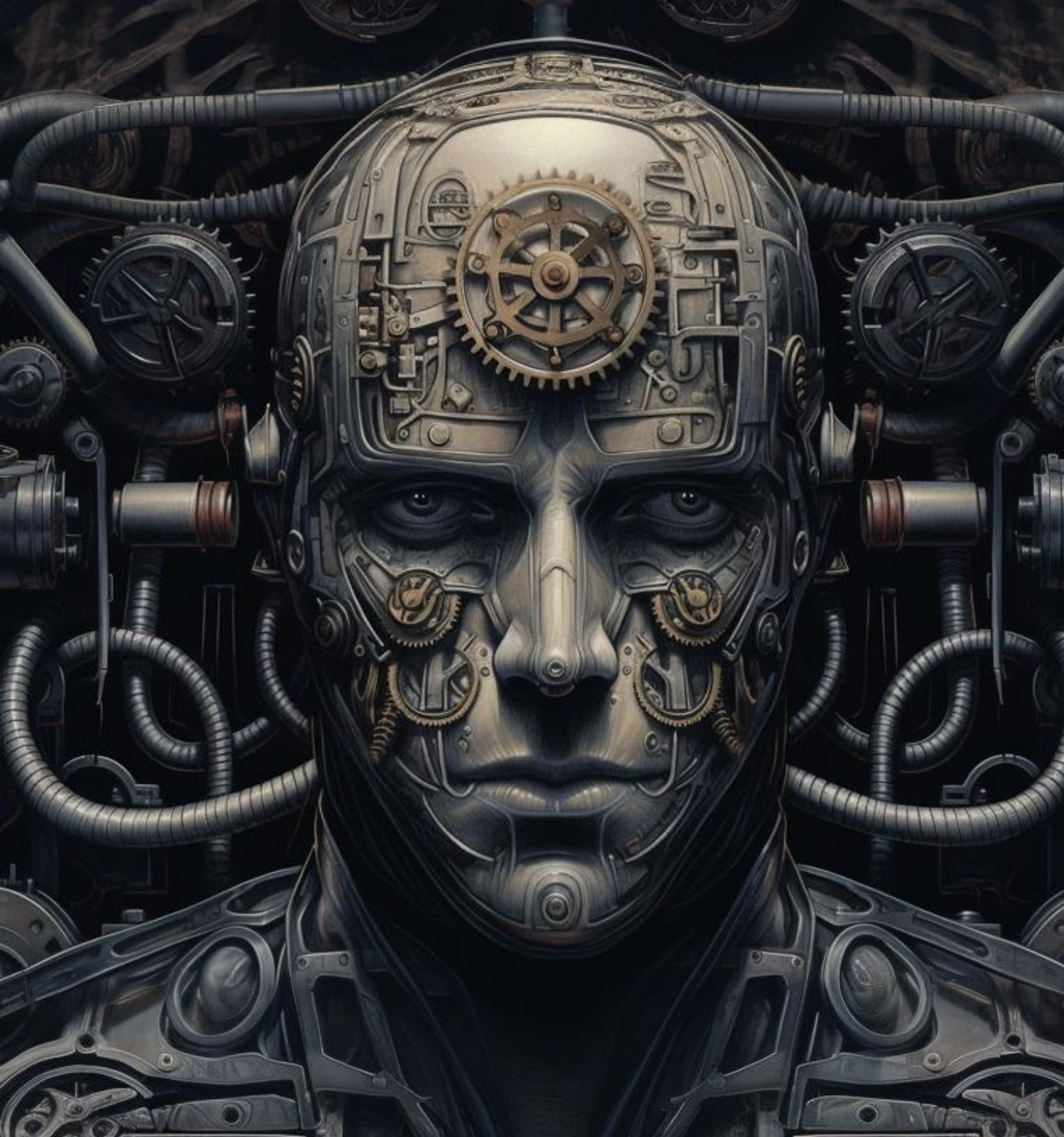
Example: Spam filter in email services.



The Evolution of AI to LLMs

Machine Learning: Algorithms can learn patterns from data, allowing for predictive modeling and personalization.

Example: Netflix recommendation



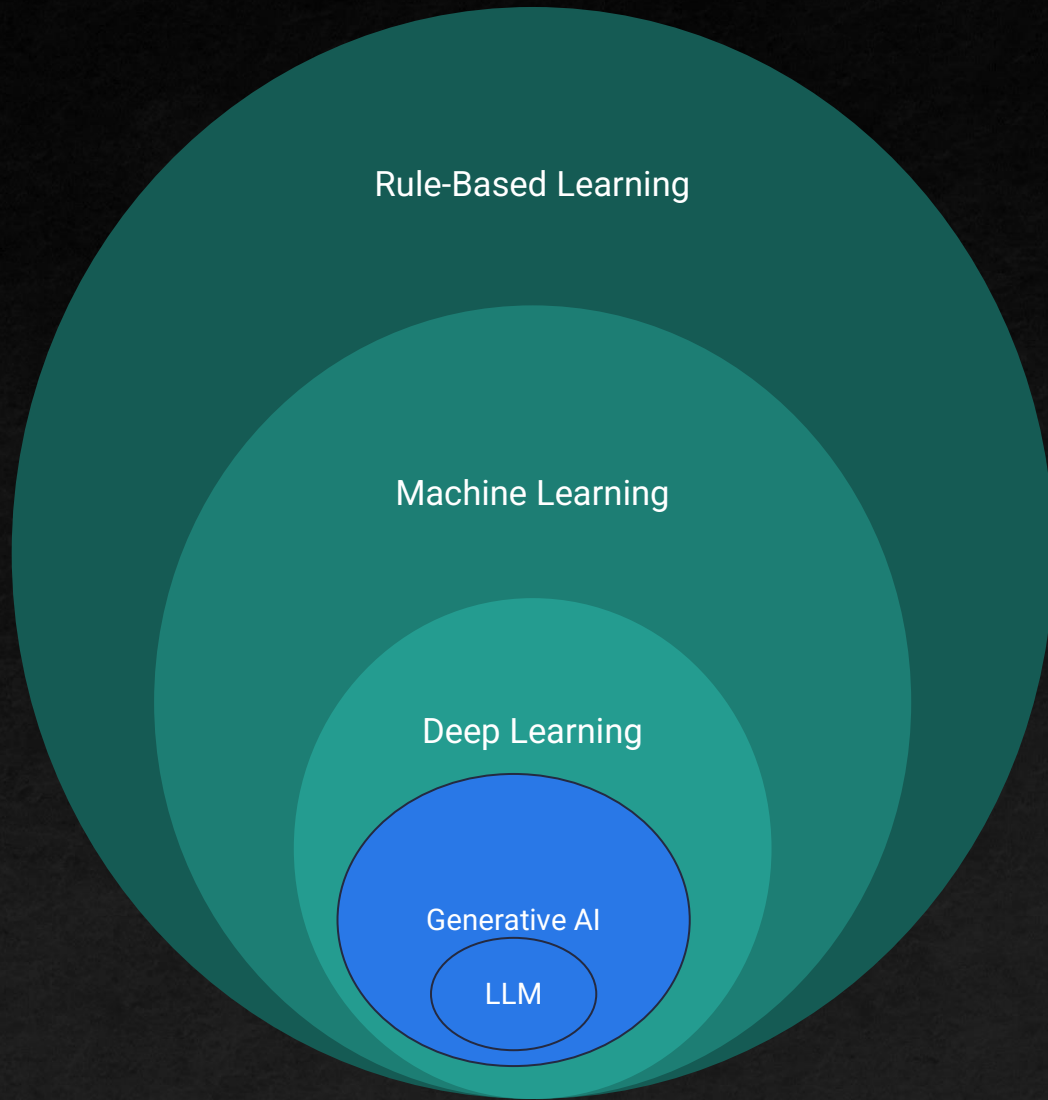
The Evolution of AI to LLMs

Deep Learning: Neural networks mimic human brain functioning, enabling more complex understanding and processing.

Example: Siri and Alexa.

Deep Learning is what makes Generative AI possible, which includes large language models.

Generative AI



- Creates new content by learning from vast datasets, mimicking human creativity.
- Self-Learning Capability: AI continuously improves by analyzing and predicting data patterns.
- Diverse Applications: Used in writing, art, coding, and simulating complex human tasks.

Generative AI – Images

Generative AI Imaging example:

In the chat box, provide the name of an animal, location, and food.

Educational Visual Aids

- Customized Learning Material
- Enhancing Online Courses
- Visually-driven educational experience

Marketing and Communications

- Unique Branding Images
- Social Media Engagement
- Event Promotion

Adapting to a Transforming Landscape



AI is good at tasks, not jobs



A Content Expert Required.



There may be a shift from a writer to an editor.

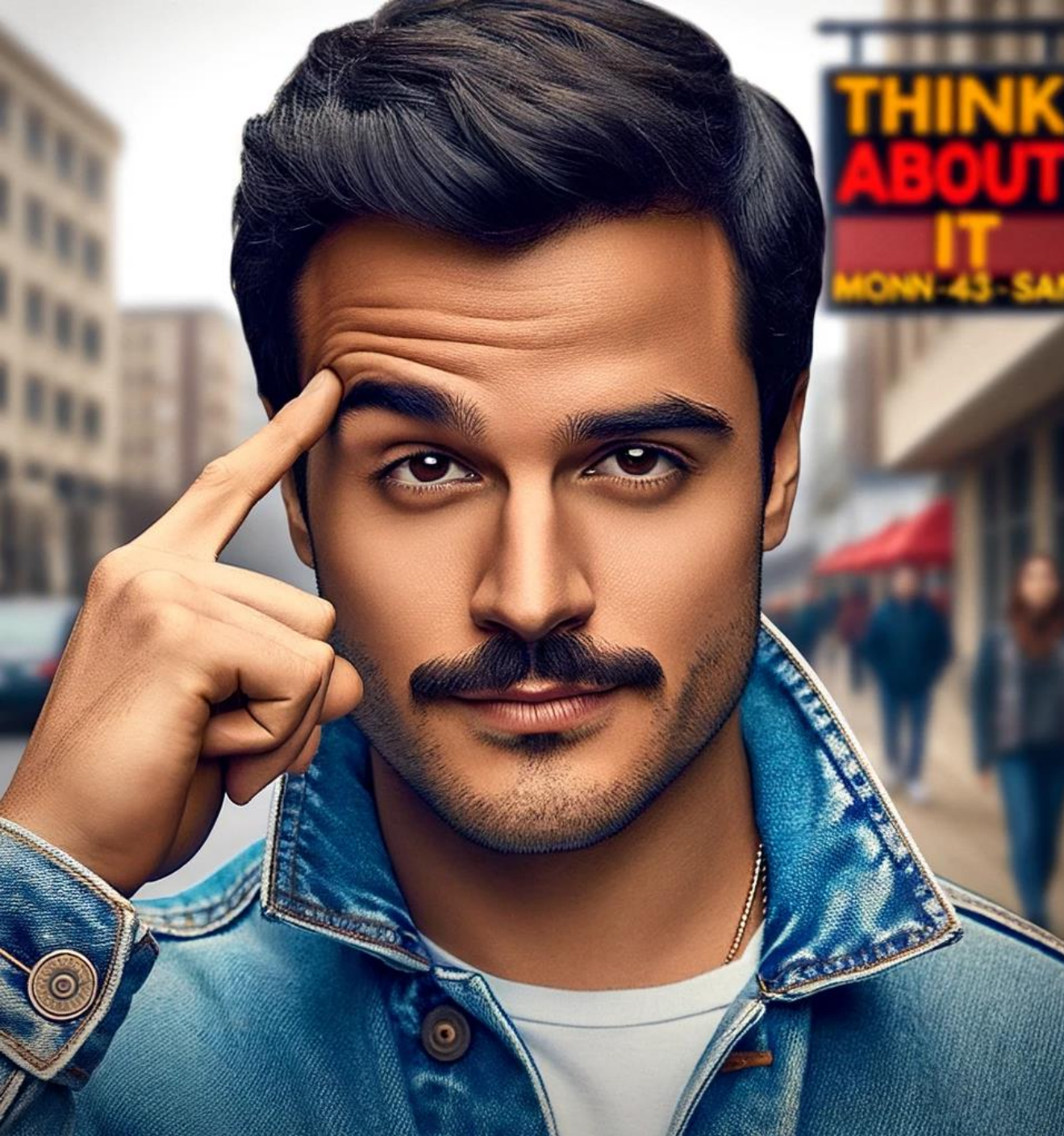


Measure content mastery beyond only written assessment



Ideas on supporting student authenticity

- Ask students to prepare for an oral defense on their writing assignments.
- Ask students to incorporate writings about their lives.
- Ask students to provide the prompts used to complete the assignments.



Think Like an LLM

LLMs statistically predicts what letter or word should come next based on a prompt. Now, let's try it, too.

1. "Once upon a..."
2. "At the break of..."
3. "In the heart of..."

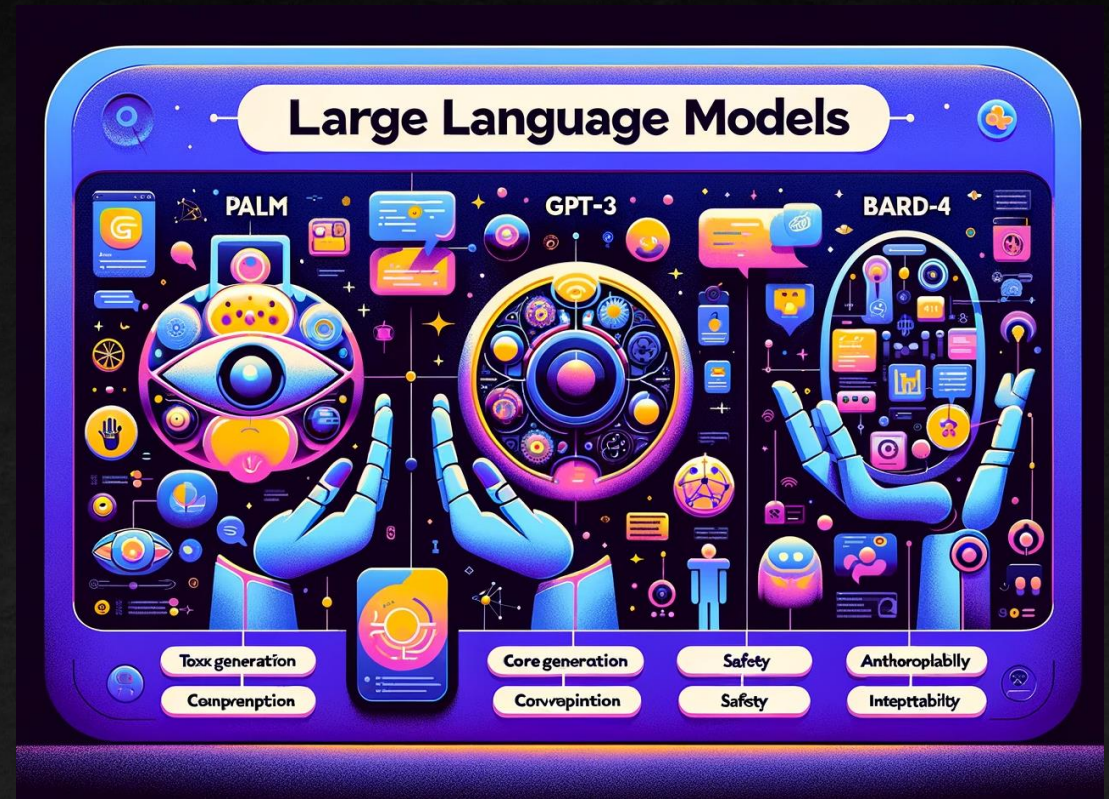
Registration

- Context 1: Education
 - Input: "Registration"
 - Potential Output: (2-5 words)
- Context 2: Vehicle Ownership
 - Input: "Registration"
 - Potential Output: (2-5 words)

Context
Matters!

Large Language Model Platforms

- OpenAI's ChatGPT 4o
- Bing's Copilot
- Anthropic's Claude
- Meta's Llama
- Google Gemini
- Perplexity.ai





Understanding LLM Predictions

LLMs will hallucinate

Difficulty in detecting plagiarism due to the inherent design of LLMs.

“AI Detectors”

- May not be reliable
- Detect students without access to “anti-detectors” (AI Laundering)
- Have a bias [“AI-Detectors Biased Against Non-Native English Writers”](#) – Stanford University
- Jailbreaking LLMs

Hallucinations by Model

Example

GTP 3.5 – Article Citations = 73%

GTP 4.0 – Article Citations = 18%

GTP 5.0 – Article Citations = ??

	GPT-3.5	GPT-4
Percentage of cited works that are fabricated (and number of cited works, in parentheses)		
All works	55% (222)	18% (414)
Articles	73% (128)	18% (255)
Books	23% (78)	8% (126)
Chapters	70% (10)	70% (23)
Websites	50% (6)	10% (10)
Among fabricated works, percentage of		
All works for which the larger work/org. is fabricated	5%	5%
Articles for which the journal is fabricated	2%	2%
Books for which the publisher is fabricated	0%	0%
Chapters for which the book is fabricated	57%	19%
Website for which the organization is fabricated	0%	0%

Table 3. Extent of fabrication among the works cited in the ChatGPT papers.

	GPT-3.5	GPT-4
Number of real (non-fabricated) cited works	101	340
Percentage with 1 or more substantive citation errors	43%	24%
Percentage with incorrect author name(s)	14%	6%
Percentage with incorrect title of the work itself	6%	3%
Percentage with incorrect date	22%	16%
Percentage of articles with incorrect journal title	14%	4%
Percentage of articles and chapters with incorrect volume, issue, or page numbers	34%	13%
Percentage of books, chapters, and websites with incorrect publisher or organization	9%	3%

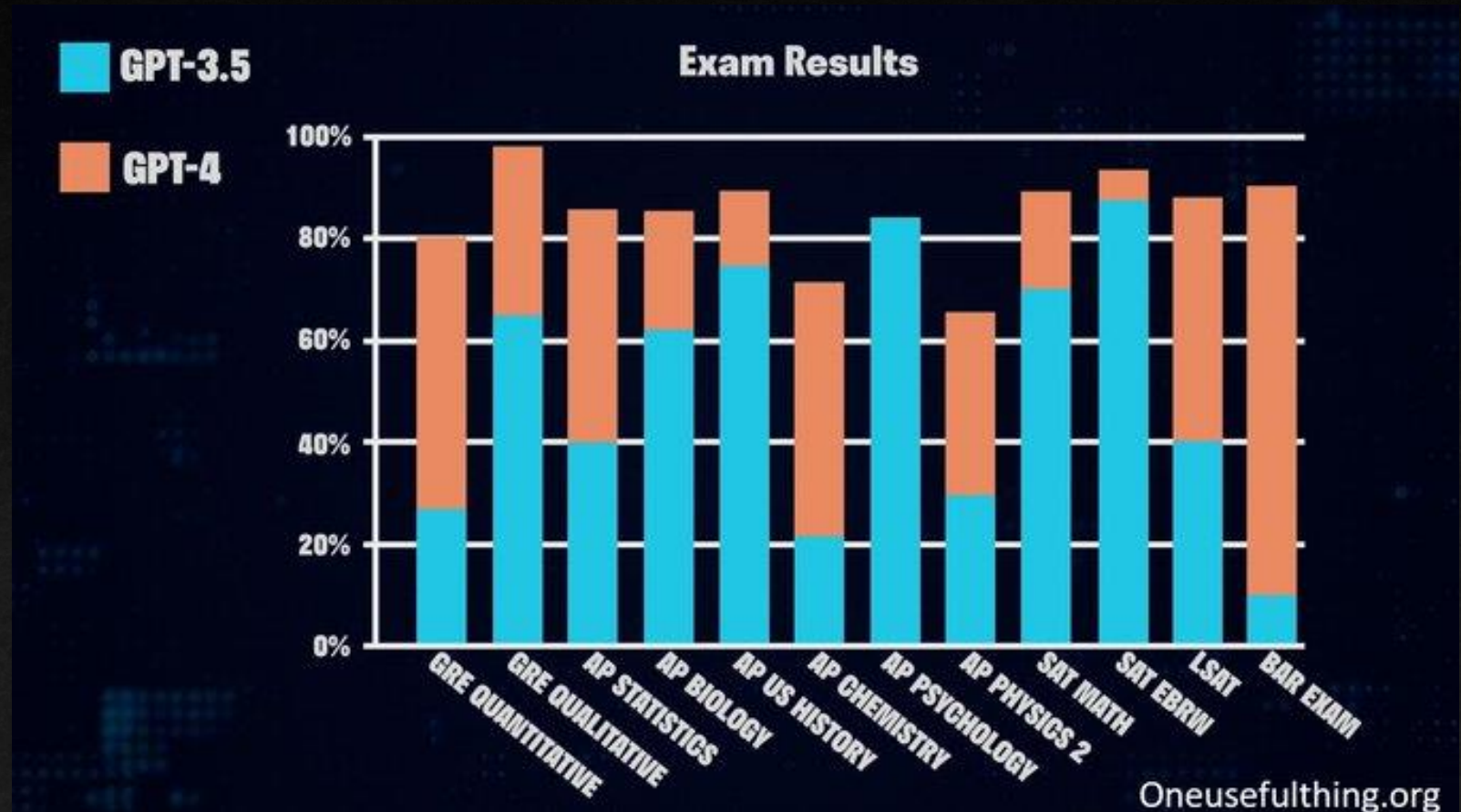
Table 4. Substantive citation errors in the citations to the real (non-fabricated) works. Except as indicated, these values refer to all works. There is no meaningful variation among the publication types (articles, books, chapters, and websites).

<https://www.nature.com/articles/s41598-023-41032-5>

ChatGPT 3.5

vs.

ChatGPT 4 (Bing)



July 17, 2023

Chatbot vs Medical Student Performance on Free-Response Clinical Reasoning Examinations

Eric Strong, MD¹; Alicia DiGiammarino, MS²; Yingjie Weng, MHS³; [et al](#)




[» Author Affiliations](#)

JAMA Intern Med. 2023;183(9):1028-1030. doi:10.1001/jamaintern-med.2023.2909



A popular chatbot is an interface for the generative pretrained transformer (GPT) large language model artificial intelligence (AI) system that generates humanlike text in response to user input.¹ An upgrade from the initial chatbot to a newer model was evaluated, and it exceeded the passing threshold for multiple-choice questions that simulate the US Medical License Examinations.² This cross-sectional study examined how well the chatbot responded to free-response, multiphase, case-based questions that better reflect real-life synthesis and application of data with broader implications for the instruction and assessment of clinical reasoning. Using clinical reasoning final examinations given to first- and second-year students at Stanford School of Medicine, we compared performance of students vs 2 chatbot models.

ChatGPT 4's Performance

-  Outscored 2nd year Stanford Med students in clinical case exams
-  Does differential diagnosis at least as well as the best current tools
-  Its answers “preferred over physician responses & rated significantly higher for both quality & empathy”

ChatGPT can “See”

- Take a pictures with your device and AI will tell you what it sees.
- Personal uses
 - Take a picture you want to sell on eBay and let ChatGPT write the ad
 - Take a picture of your refrigerator and ask what is keto-friendly.



ChatGPT Vision – Workforce Implications

Radiology Report Generation

Prompt: Write a radiology report for this image as an expert radiologist.

GPT-4V - Radiology Report

Exam: Abdominal x-ray

History: Patient presents with abdominal pain and distention

Findings: The abdominal x-ray demonstrates a dilated stomach and small bowel loops, suggestive of a partial small bowel obstruction. There is also a small amount of air in the rectum. No free intraperitoneal air or pneumoperitoneum is noted. The liver, spleen, and kidneys appear unremarkable.

Impression: Findings are suggestive of a partial small bowel obstruction. Further imaging studies and clinical correlation are recommended.

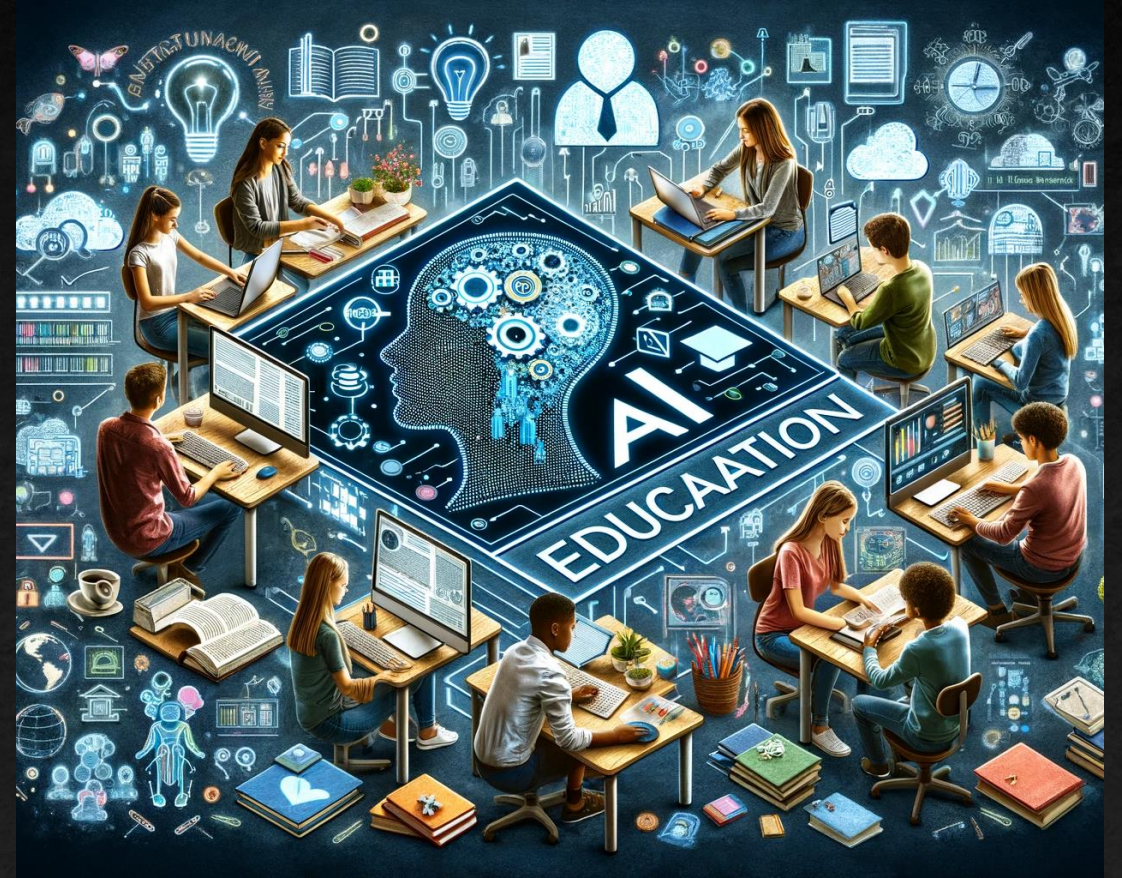
Evaluation from Professionals: Correct study identification, correct diagnosis

Source: arXiv/2309.17421



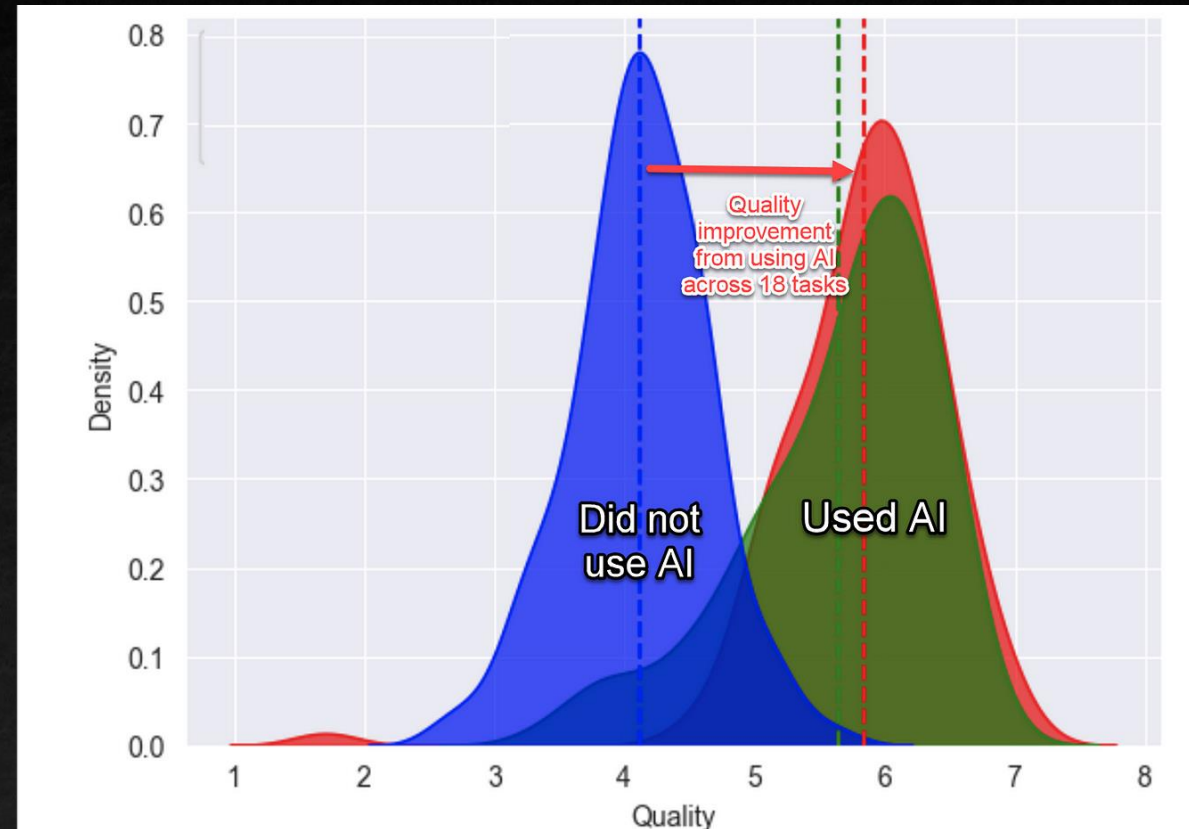
Generative AI and Career Success

- **Writing Enhancement:** AI improves students' writing of cover letters, resumes, and emails to supervisors.
- **Increased Productivity:** AI familiarity boosts efficiency in future workplaces.
- **AI Collaboration:** Prepares students for teamwork with an AI assistant.
- **Creative Innovation:** Encourages creative thinking, which is valuable in modern jobs.
- **Future-Ready Skills:** Early AI education gives a competitive career advantage.



AI Proficiency: A Highly Valued Skill in the Modern Workforce

- AI use led to 12.2% more tasks completed.
- Tasks done 25.1% faster.
- Experience a 40% increase in work quality.
- This boost was achieved using the standard GPT-4 model without any specialized training or tuning.



<https://www.oneusefulthing.org/p/centaurs-and-cyborgs-on-the-jagged>

Figure 1: Quality Distributions with and Without AI—Complaint Drafting

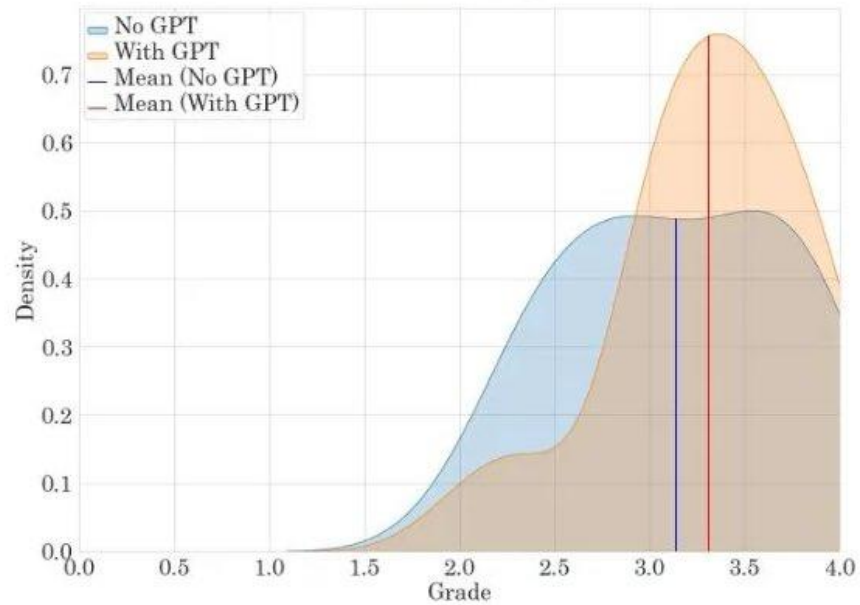
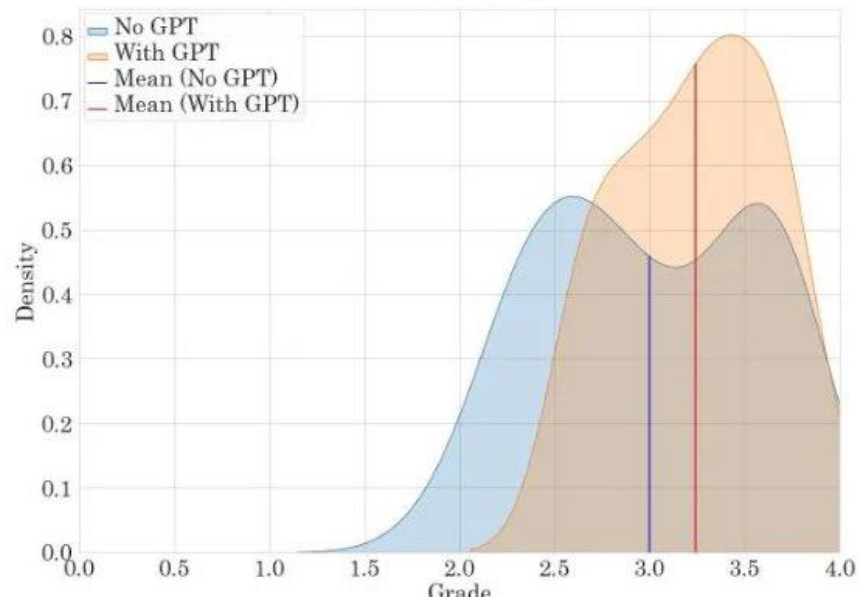


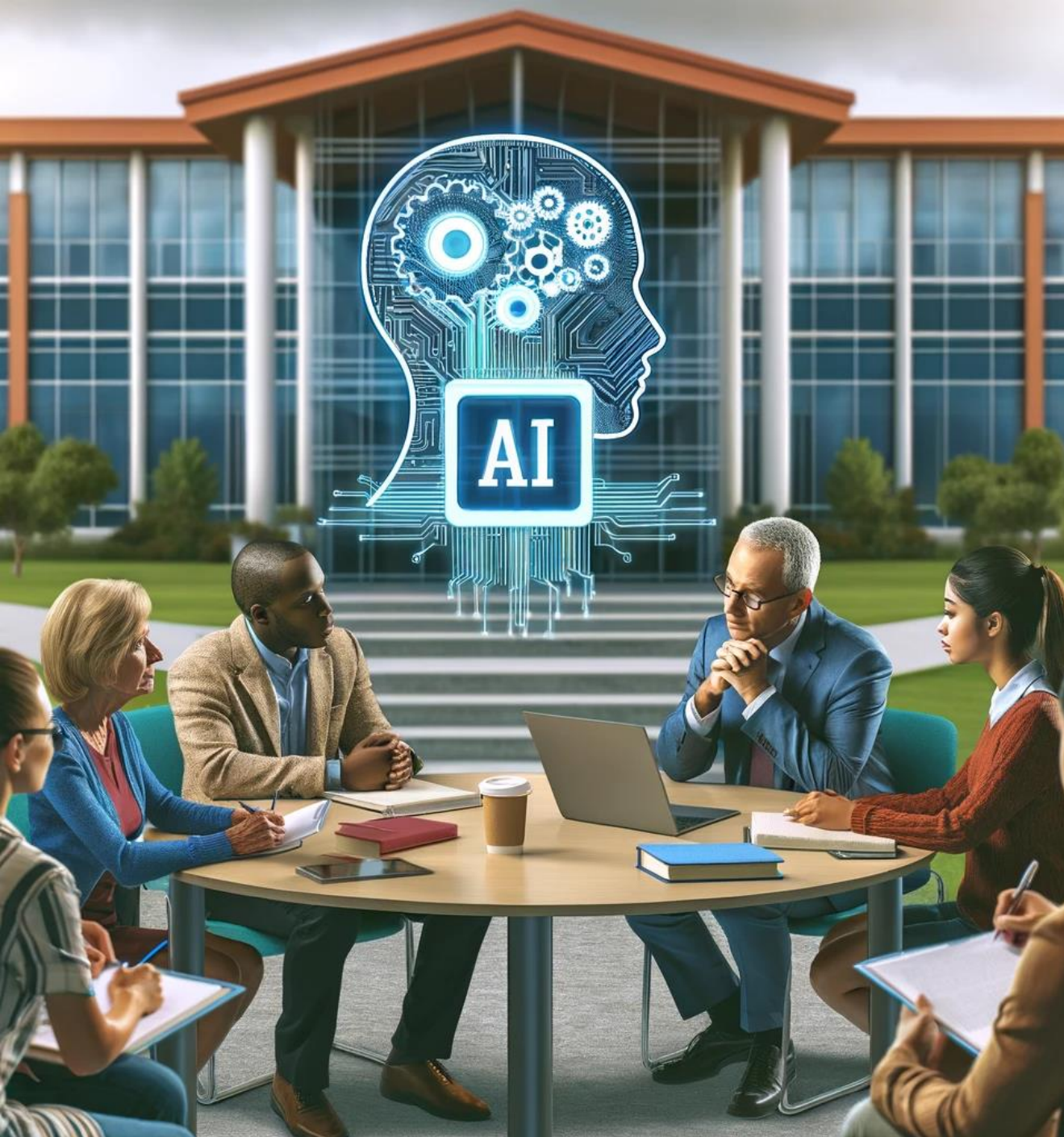
Figure 2: Quality Distributions with and Without AI—Contract Drafting



The Impact of GPT-4 on Law Students' Performance

- Research involving law students using GPT-4 highlights advancements in the legal sector.
- Examination of the effects of AI on student performance.
- ***AI's role in reducing the disparity in skill levels among students.***

Choi, Jonathan H. and Monahan, Amy and Schwarcz, Daniel, *Lawyering in the Age of Artificial Intelligence* (November 7, 2023). Minnesota Legal Studies Research Paper No. 23-31, Available at SSRN: <https://ssrn.com/abstract=4626276> or <http://dx.doi.org/10.2139/ssrn.4626276>



AI Policy Considerations

- Step 1 - Have a Policy
- Recognize that if college leadership is debating AI's role, we must assume students require clear guidance to navigate these complexities.
- Allow departments the leeway to identify and adapt to their optimal approach within the overarching policy framework.
- Given that Large Language Models (LLMs) have been publicly available for under 18 months, treat academic honesty concerns involving these technologies as opportunities for education rather than solely as disciplinary issues.

Ethan Mollick

Wharton School, UPenn

“AI Required”

I expect you to use AI (ChatGPT and image generation tools, at a minimum), in this class. Some assignments will require it. Learning to use AI is an emerging skill.

Be aware of the limits of ChatGPT:

- If you provide minimum effort prompts, you will get low-quality results. You will need to refine your prompts to get good outcomes. This will take work.
- Don't trust anything it says. If it gives you a number or fact, assume it is wrong unless you either know the answer or can check in with another source.
- You will be responsible for any errors or omissions the tool provides. It works best for topics you understand.

AI is a tool, but one that you need to acknowledge using.






- Please include a paragraph at the end of any assignment that uses AI explaining what you used the AI for and what prompts you used to get the results. Failure to do so violates academic honesty policies.

Democratizing Education: The Importance of Clear Policies

Different Rules, Different Outcomes

- Just like in sports, where knowing the rules can make or break a player's performance, understanding the guidelines for AI usage in education can significantly impact a student's success.
- Students who are aware of and empowered to use generative AI will likely perform at a higher level than those who are not clear about what is permissible.

Clearly Define AI Usage in Your Class

Course Icon	Category	Description
	No AI Permitted on This Assignment	<i>Emphasize independent critical thinking, encourage originality and personal insight, and develop analytical skills without AI reliance.</i>
	Generating Ideas	<i>Use AI for brainstorming and concept development, generate initial thesis statements, slogans, or designs, and consider AI ideas as a starting point for further development.</i>
	Creating Outlines and First Drafts	<i>Utilize AI for structuring paper or project outlines, organize thoughts for logical information flow, and review and modify AI outlines for specific assignment needs.</i>
	Rewriting, Editing, Polishing, Debugging	<i>Refine drafts using AI for clarity and language improvement, use AI for debugging code, and personally review AI suggestions to maintain individual voice.</i>
	AI Required	<i>Embrace AI as mandatory for task completion, develop skills using AI for diverse tasks, and ensure ethical use and proper AI attribution.</i>

If you're not sure how to use AI... Ask AI
"How can AI be used in my classroom?"

Personalized Learning

AI can analyze data on student performance and tailor study material to their individual needs and learning style.

Improving Assessment

AI can grade assignments and provide feedback to students, freeing up instructors' time and providing students with instant feedback.

Enhancing Engagement

AI can provide interactive and immersive learning experiences, such as virtual reality simulations, to keep students engaged and motivated.

Streamline Admin Task

AI can automate repetitive tasks, such as class scheduling, course registration, and transcript analysis, freeing up instructors' time and resources.



Practical Applications in Education

A Brief Overview of Promising LLM and Generative AI Applications

Individualized Lessons

Prompt: I am a biology instructor, and I am teaching the concept of mitochondria in my class. I want to individualize instruction for one of my students, and this student likes Austin Powers movies. Please create a scenario that includes these concepts.

The Mitochondrial Spy Who Powered Me An Austin Powers-Inspired Biology Lesson



Imagine the cell as Dr. Evil's secret lair, complete with various rooms, secret agents, and high-tech gadgets. The lair represents the cell, and the different rooms and gadgets represent the organelles within the cell.

Characters

- **Austin Powers:** Represents a molecule that needs energy to function.
- **Dr. Evil:** Represents a harmful virus or bacteria that tries to disrupt cellular functions.
- **Mini-Me:** Represents the mitochondria, the "powerhouse" of the cell.
- **Fembots:** Represent ATP molecules, the energy currency of the cell.
- **"Mojo":** Represents glucose, the primary source of energy for the cell.

Connect Content to Workforce Skills

Prompt:

As a mathematics instructor, I want to align my lessons with my students' careers. Although I have no experience in welding, I have a student who wants to be a welder student, and I want to create a 60-minute lesson plan that connects the concept of "Slope" with a specific fundamental task for beginning welders. Since I lack experience in the field of welding, I am seeking your help to create this lesson plan and provide me with notes on how "Slope" aligns with this task

Lesson Plan: Understanding Slope in Welding

Section	Duration
Introduction to Slope <ul style="list-style-type: none"> Start by reviewing the mathematical concept of slope (rise over run). Discuss different types of slopes: positive, negative, zero, and undefined 	10 min
Understanding Slope in Welding <ul style="list-style-type: none"> Introduce basic welding joints and positions (e.g., flat, horizontal, vertical, overhead). Explain how the concept of slope is relevant in determining the angle of welding. Discuss how welders need to adjust their techniques based on the slope/angle of the joint. 	15 min
Interactive Activity: Graphing Slope <ul style="list-style-type: none"> Provide students with graph paper and ask them to graph different slopes that might represent welding angles. Students can use a ruler to ensure accurate representation of slope. Discuss how the slope on the graph can represent the angle at which a weld is made. 	20 min
Real-World Applications <ul style="list-style-type: none"> Show diagrams or images of different welding joints. Ask students to identify the type of slope each joint represents. Discuss how understanding slope helps in achieving the correct weld angle for strength and durability. 	10 min
Q&A and Wrap-Up	5 min
Notes on Slope in Welding: Slope is directly related to the angle of welding, crucial for precision, and important for safety considerations. Understanding slope helps in achieving the correct weld angle for strength and durability.	

Assign Personalities to AI

Examples:

- Guidance Counselor
- Administrative Assistant
- Instructional Designer
- Campus Security
- Pedagogical Expert in Active Learning
- Freud, Piaget, Vygotsky



Other Practical Applications

- Create presentation outlines and PowerPoint files (ChatGPT 4)
- Student Writing Assignments
 - Create a list of research topics for students
 - Create the rubric for assessing student work
 - Draft directions for the assignment
- Provide Student Feedback
 - Review student work for a quick assessment of areas of improvement
 - Upload rubric and identify Lexile level of students to provide specific feedback
 - Review papers for proper MLA, APA, etc. citations



Thank you!

Questions and Comments