



Generative AI's
Impact on Workplace
and Workforce
Development.

Norms and Expectations



SLANT



S - Sit up



L - Lean in and Listen



A - Ask questions



N - Nod to provide non-verbal feedback



T - Technology – Avoid multitasking with tech tools.

Today's Objectives



Brief overview of
Generative AI



Impact of Generative AI
on the Workplace



Dr. Lane Freeman



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



Lorraine Boucher Lane's Digital Assistant

- Designed within ChatGPT's Custom Instructions
- Daughter to Bobby Boucher and Vicki Vallencourt
- Bachelor's Degree in Business Administration from Louisiana State University
- MBA from Tulane University's School of Business

AI Avatar



AI Avatar – Chinese Translation



AI Avatar - Updates



Tesla's Optimus Robot



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





Community Builder ChatGPT, Sing Me a Song!

1. Team up with folks behind or in front of you.
2. Access the AI Community Builder QR Code
3. Identify an Uncommon Commonality
4. Create a TEAM Name
5. Share a popular Southern saying
6. Identify a Publisher to Submit the Form
7. Each group will submit ONE form

Example: Everyone in the group is the youngest sibling in their family. Team Name: Young Guns



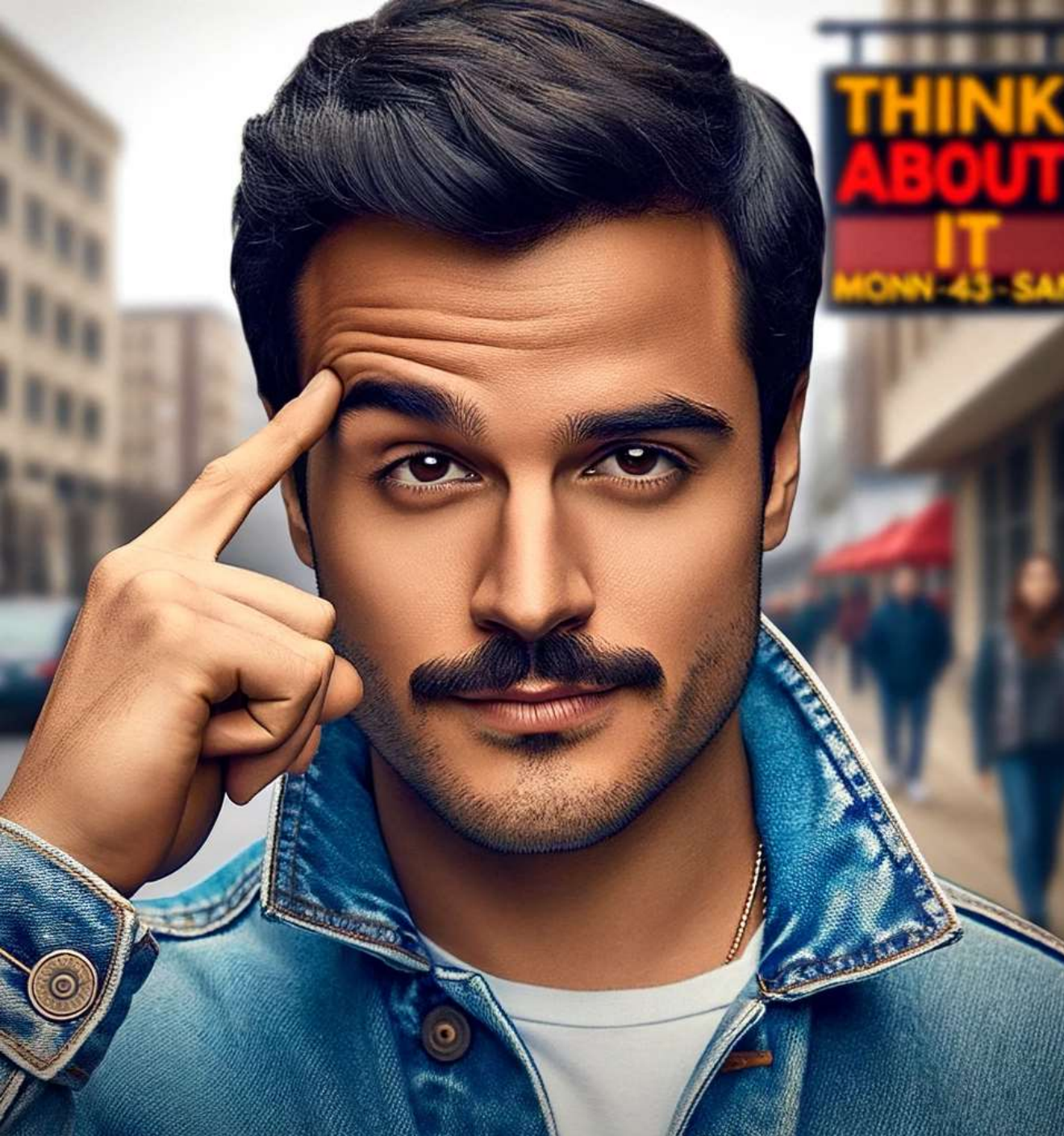
The Evolution of AI to LLMs

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

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

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

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



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..."

Context Matters!

Registration

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

Citation

- Context 1: Academic Research
 - Input: "Citation"
 - Potential Output: (2-5 words)
- Context 2: Traffic Violations
 - Input: "Citation"
 - Potential Output: (2-5 words)

Large Language Model Platforms

- OpenAI's ChatGPT 4/Copilot
 - Renowned for sophisticated text generation and comprehension.
 - Capable of wide-ranging tasks, including conversation and content creation.
 - Highly sophisticated in answering complex queries.
- Google's Gemini
 - Built on LaMDA (Language Model for Dialogue Applications).
 - Designed for natural, open-ended conversational AI experiences.
 - Leverages Google's extensive information database.
- Anthropic's Claude
 - Developed with a focus on safety and interpretability in AI.
 - User-friendly design, understanding and responding to human emotions.
 - Prioritizes user well-being in interactions.



Assign Personalities to AI

Examples:

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



AI's Impact on the Workforce

At your table discuss examples of where you've heard reports of AI impacting the workforce.

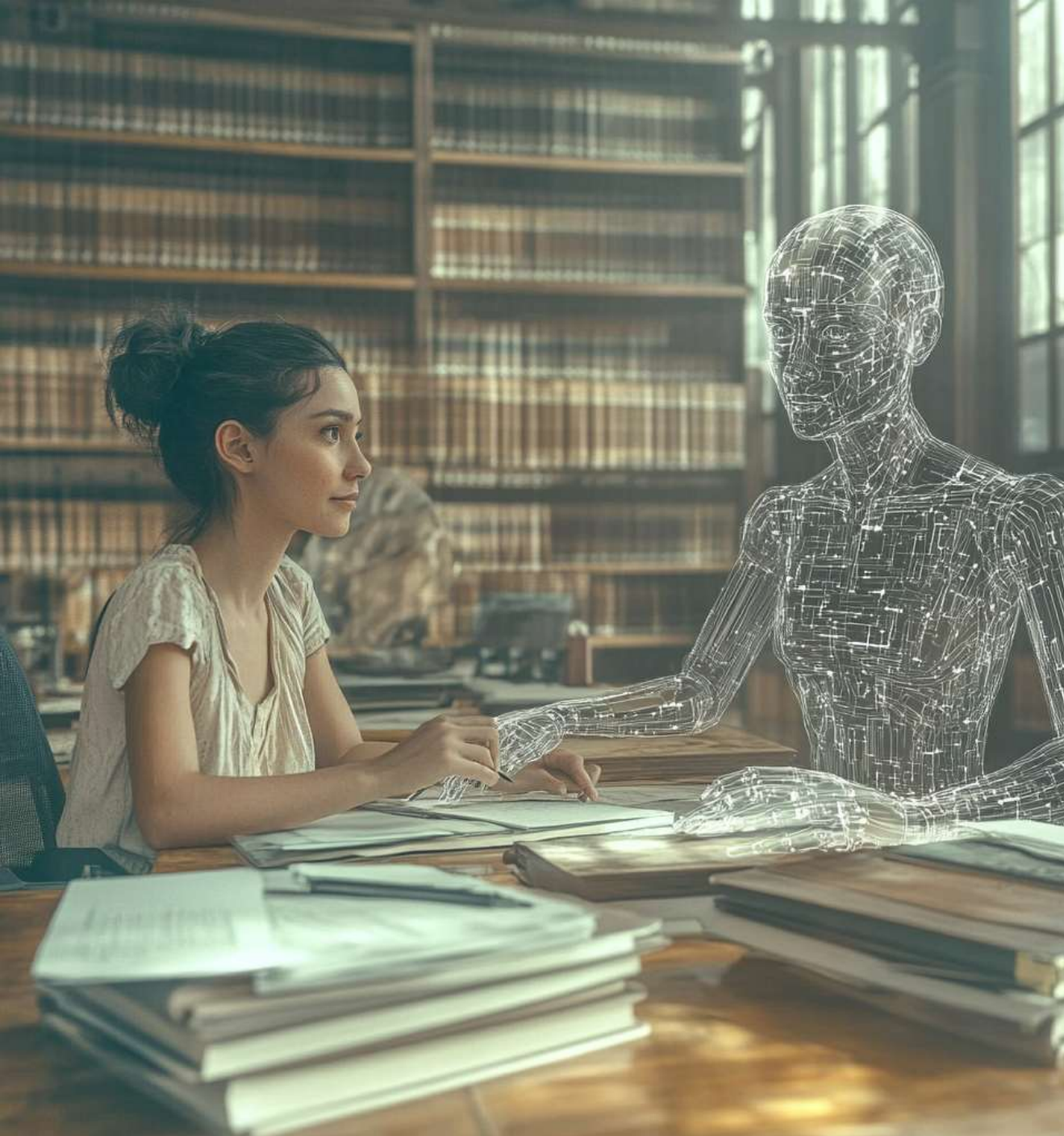




Impact of AI and Industrial Robots on Manufacturing

- 20 robots per 1,000 workers in U.S. manufacturing, significantly increasing automation in the sector.
- AI-powered robots are handling repetitive tasks like assembly, welding, and material handling with high precision.
- Automation in manufacturing has led to a 6% decline in wages for lower-skilled workers since the introduction of AI and robotics.
- While automation boosts productivity, it also displaces lower-skilled jobs, creating demand for more skilled technicians to manage AI system

Sources: Chicago Booth Review, World Economic Forum, Exploding Topics



Impact of AI on Paralegals

- AI tools now handle tasks like legal research, document drafting, and case analysis.
- Chatbots are assisting in client intake, document preparation, and legal guidance.
- 42% of employers expect to automate significant clerical roles, including paralegals, by 2027.
- 65% of data-related tasks in legal professions could be fully automated by 2027, potentially reducing billable hours and shifting job responsibilities.
- Sources: World Economic Forum, Exploding Topics, MyCase

Impact of AI on Call Center Agents

- 70% of customer inquiries are expected to be handled by AI without human intervention by the end of 2024.
- Call centers implementing AI can achieve a 30% reduction in call handling time, improving efficiency.
- 65% of call centers have already integrated chatbots for basic customer service tasks.
- While automation increases efficiency, it also reduces the need for human agents to handle repetitive inquiries, though human agents remain essential for complex issues.

Sources: Zendesk, ARC Customer Experience, World Metrics





Preparing Students for the Future of Work with AI

- AI and automation are rapidly changing industries; it's crucial that students learn how to work with and manage generative AI systems.
- Students who develop AI expertise and adapt to working alongside AI will be highly valued in the job market, while others may see tasks automated.
- Those skilled in AI will have the opportunity to keep their jobs by managing, troubleshooting, and optimizing AI systems in the workplace.

AI's Impact on Biotechnology

1. Drug Discovery and Development:

- **Molecular Design:** AI algorithms like those used by *BenevolentAI* analyze vast amounts of biomedical data to identify potential drug candidates, predict how they might behave with different diseases, or suggest new uses for drugs that failed in previous trials for other conditions.
- **Protein Structure Prediction:** Tools like *AlphaFold* by DeepMind have revolutionized how we understand and predict protein structures, which is crucial for drug design and understanding disease mechanisms.

2. Archon Biosciences Unveils AI-Powered “Antibody Cages”

- AI-driven antibody design accelerates drug discovery.
- Potential to target previously “undruggable” diseases.



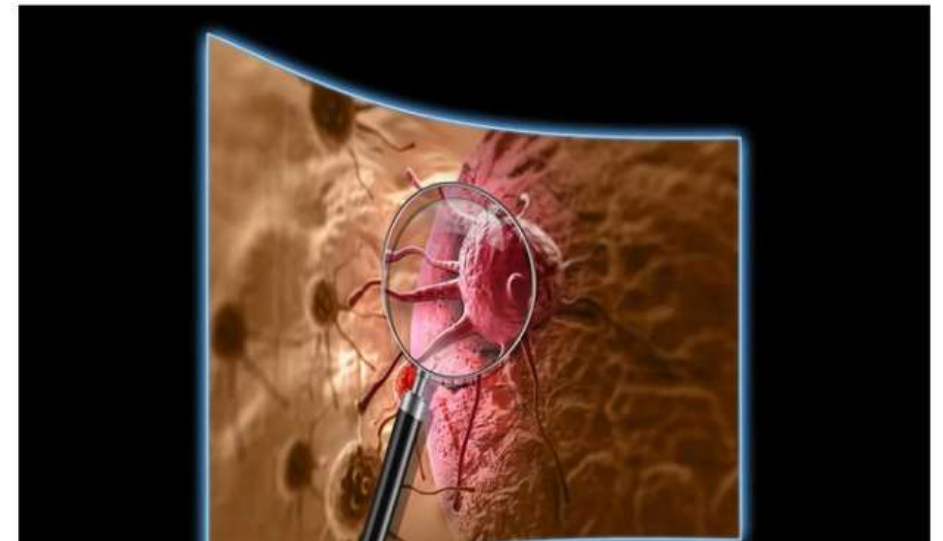
Harvard Medical School-Developed AI Model – CHIEF

Clinical Histopathology Imaging Evaluation Foundation

1. 96% accuracy in cancer detection, surpassing human methods.
2. Analyzes 19 cancer types, broader scope than specialists.
3. Predicts survival and treatment responses via tumor microenvironments.
4. Processes millions of images faster than manual diagnosis.
5. Identifies new tumor traits for potential treatment strategies.

96% Accuracy: Harvard Scientists Unveil Revolutionary ChatGPT-Like AI for Cancer Diagnosis

BY HARVARD MEDICAL SCHOOL – OCTOBER 17, 2024 NO COMMENTS 9 MINS READ



CRISPR Technology Applications

- Malaria Control
 - Gene drives to reduce mosquito populations.
 - Sterile female mosquitoes to halt reproduction.
- Extinct Species Revival
 - Editing elephant DNA to recreate mammoth traits.
 - Potential ecological benefits like restoring grasslands.
- Sustainable Agriculture
 - Vitamin D enriched tomatoes for nutrition.
 - Low arsenic rice for safer consumption.
- Cancer Treatment
 - Enhanced CAR T-cell therapy with CRISPR.
 - Editing T-cell RNA to combat exhaustion.
- Rapid Diagnostics
 - SHERLOCK and DETECTR for quick pathogen detection.
 - High sensitivity for point-of-care diagnostics.



The screenshot shows the NotebookLM interface. On the left, there is a sidebar with the NotebookLM logo and a list of sources: 'Sources' (with a lock icon), 'Select all sources' (checked), and 'Pasted Text' (checked). The main area is titled 'Untitled notebook' and contains a 'Help me create' section with buttons for 'FAQ', 'Study Guide', 'Table of Contents', 'Timeline', and 'Briefing Doc'. To the right is an 'Audio Overview' section with a status 'Generating conversation...' and a message: 'This may take a few minutes. No need to stick around!'. Below this is a 'Summary' section with a paragraph about CRISPR. At the bottom, there is a 'View Chat' button, a text input field with '1 source' and 'Start typing...', a send button, and a 'Notebook guide' link. A disclaimer at the bottom reads: 'NotebookLM may still sometimes give inaccurate responses, so you may want to confirm any facts independently.'

AI to Summarize Content as a Podcast

Notebook LM

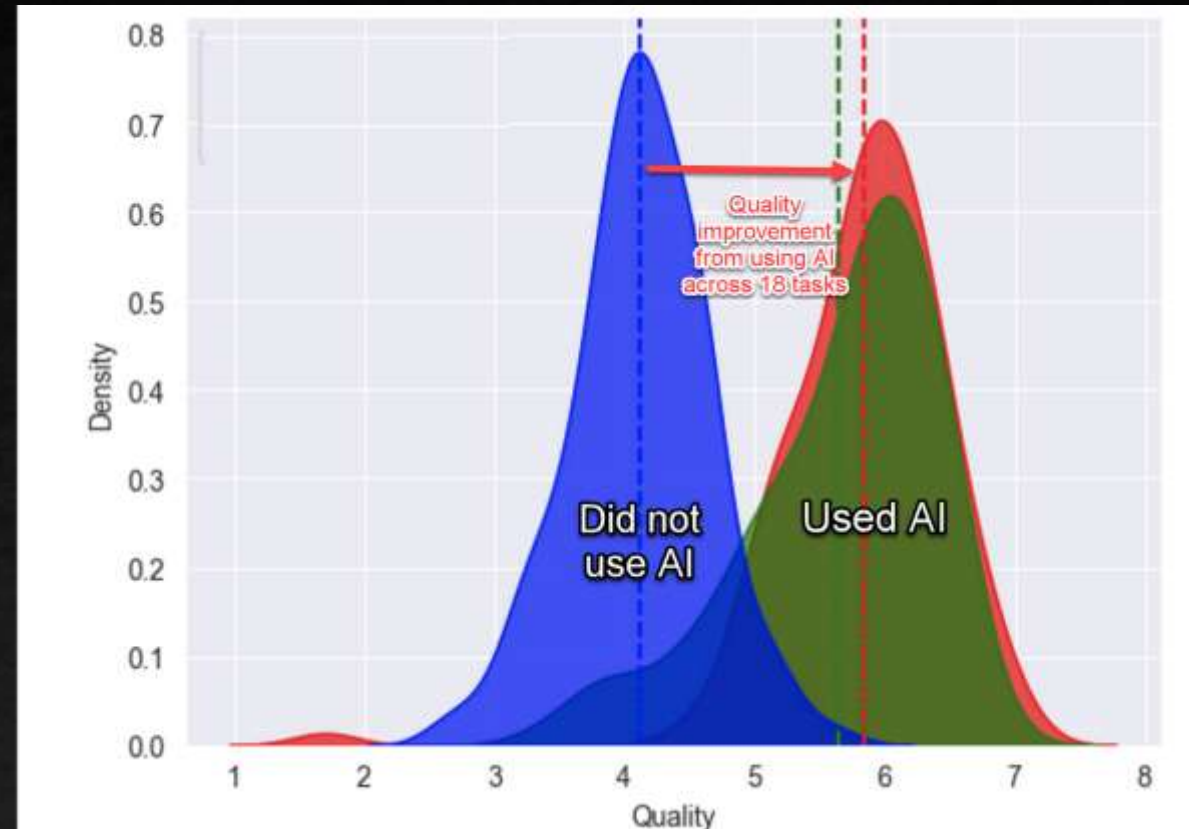




AI Generates a Song on New Information

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>



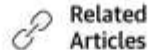
Secret Cyborgs

- Fear of punishment for improper AI use.
- Concern about losing respect from colleagues.
- Worry that productivity gains will lead to layoffs.
- Lack of reward or recognition for AI use.
- Fear of increased work expectations due to AI efficiency.

Source: Ethan Mollick, [AI in Organizations: Some Tactics, One Useful Thing](#).




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”



Practical Applications in Education

A Brief Overview of Promising LLM and Generative AI Applications

FAIL - “First Attempt In Learning”



- Be Transparent with Students about the Why Struggle is Important to Learning
- Ask students to trust instructional interventions to ensure workforce success.

- Strike the Balance Between AI Assistance and Learning Struggles
- Examples of Productive Struggle
 - Teaching web design
 - Cooking a new recipe
- AI as a Guide, Not a Solution
- Encouraging Resilience and Growth Mindset



AI as Job Interview Simulator



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

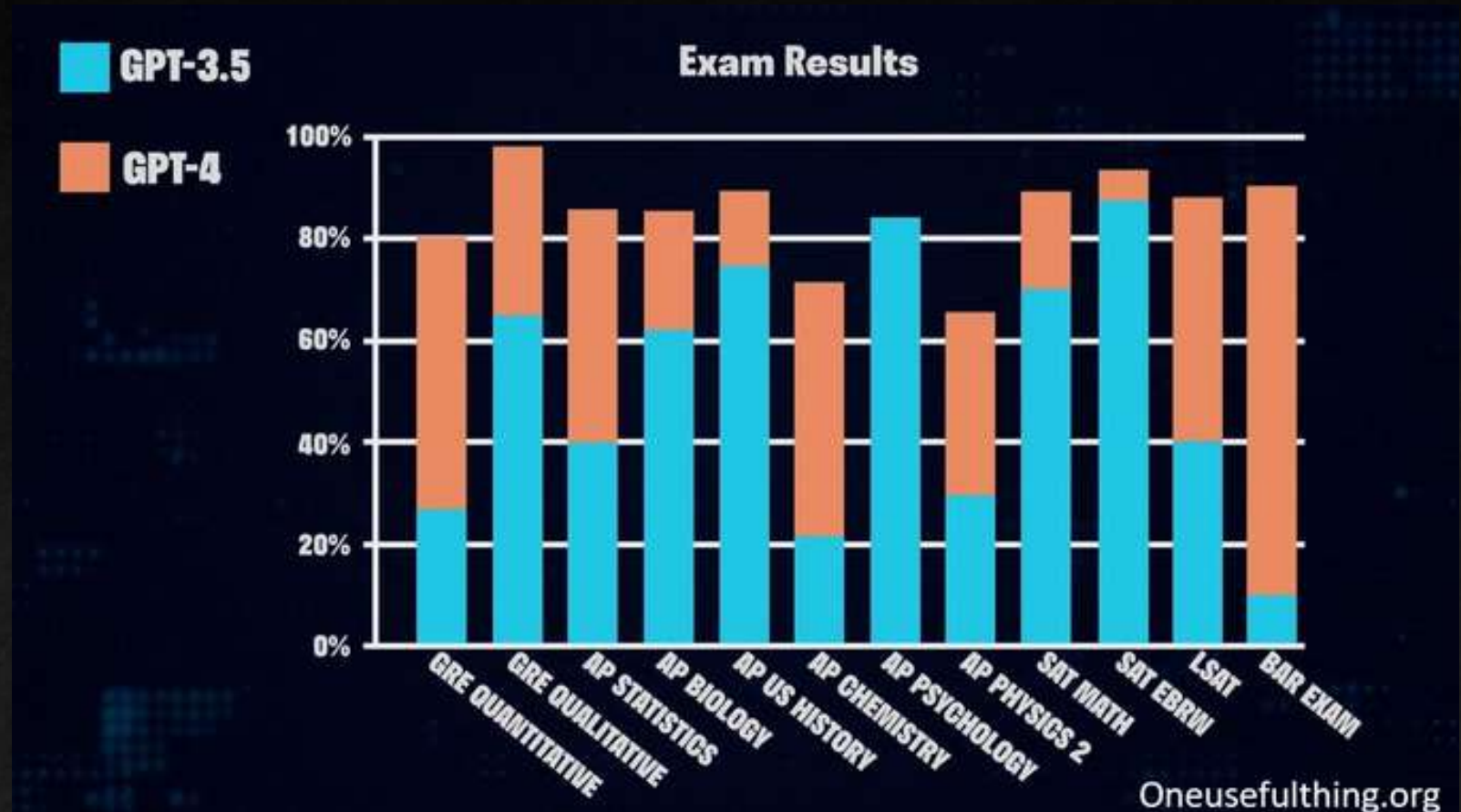
Lesson Plan: Understanding Slope in Welding

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.	

ChatGPT 3.5

vs.

ChatGPT 4 (Bing)





Understanding LLM Predictions

LLMs will hallucinate

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

“AI Detectors”

- May not be reliable
- Have a bias [“AI-Detectors Biased Against Non-Native English Writers”](#) – Stanford University
- “AI Laundering”

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>

Ethical Hacking



- Ethical hackers (aka "white hat" hackers), are professionals hired by organizations to identify security weaknesses in their computer systems. Their goal is to expose vulnerabilities before malicious hackers can exploit them
- Example - Amazon's Bug Bounty Program
 - Amazon pays ethical hackers to detect flaws in its systems.
 - Average payment: \$4,500 per report.
 - Critical issues can earn hackers up to \$20,000 (GoGet Secure, n.d.; HackerOne, n.d.).

Ethically Hacking an AI Detector

- **AI Detector Limitations:** Often successful at catching students who have yet to learn how to prompt AI or lack technical know-how.
- **Ethical Hacking Simulation:** This exercise will demonstrate an AI detector "laundering" scenario in a North Carolina Community College course (HUM 120 assignment).
- **Key Objective:** Show how AI-generated content can be modified to bypass AI detectors, revealing potential vulnerabilities.

Sample Assignment:

HUM 120 Assignment: Exploring Renaissance Humanism

Objective:

Students will analyze a key aspect of Renaissance humanism and its impact on art, literature, or philosophy. This assignment aims to develop students' critical thinking, analytical writing, and understanding of the humanities.



Laundering the AI Paper

The screenshot shows the Undetectable AI website interface. At the top, there is a navigation bar with the logo [ud] UNDETECTABLE AI, language options (US, EN), and links for AI Detector and Humanizer, Business Solutions, Documents, Pricing (SALE), API, and Earn. Below the navigation bar, there is a header area with 'READABILITY' set to 'University' and 'PURPOSE' set to 'Essay'. The main content area displays an AI-generated essay about Humanism in Renaissance Art. Below the essay, there are buttons for 'MORE READABLE', 'BALANCED', and 'MORE HUMAN'. At the bottom of the interface, there is a checkbox for 'I AGREE TO THE TERMS OF SERVICE (NO ACADEMIC MISCONDUCT)' and buttons for 'CHECK FOR AI' and 'HUMANIZE'. A red warning message states: '⚠️ Your content is detected as written by AI ⚠️'. Below this, there is an 'AI DETECTION LIKELIHOOD' section with various detection tools and their results: GPTZERO (yellow warning), OPENAI (yellow warning), WRITER (yellow warning), CROSSPLAG (yellow warning), COPYLEAKS (red warning), SAPLING (red warning), CONTENTATSCALE (yellow warning), and ZEROGPT (red warning). A key at the bottom indicates: KEY: 100% HUMAN (green), 50% HUMAN (orange), 0% HUMAN (red).

1. After writing the paper using AI with well-crafted prompts, Google “AI Detection Hackers”
2. Access one of the hackers like “Undetectable.ai”
3. Copy and paste the essay into the appropriate window.
4. Scan the essay for “AI Detection Likelihood”
5. Select the academic level and purpose
6. Click on “Humanize”

Ask AI how to Authentic Learning in the AI Era

Below is a paper that I've traditionally assigned students but I'm worried about students not using AI to complete the paper because I really want to assess their understanding I want to include the assignment below but I want your ideas on ways to ensure that students are learning the material and aren't using AI for everything this may include a multi-phase approach like submitting a rough draft or a language or some other recommendations you may have look forward to your response

HUM 120 Assignment: Exploring Renaissance Humanism

Assignment: Analyzing Renaissance Humanism

Objective:

Students will analyze a key aspect of Renaissance humanism and its



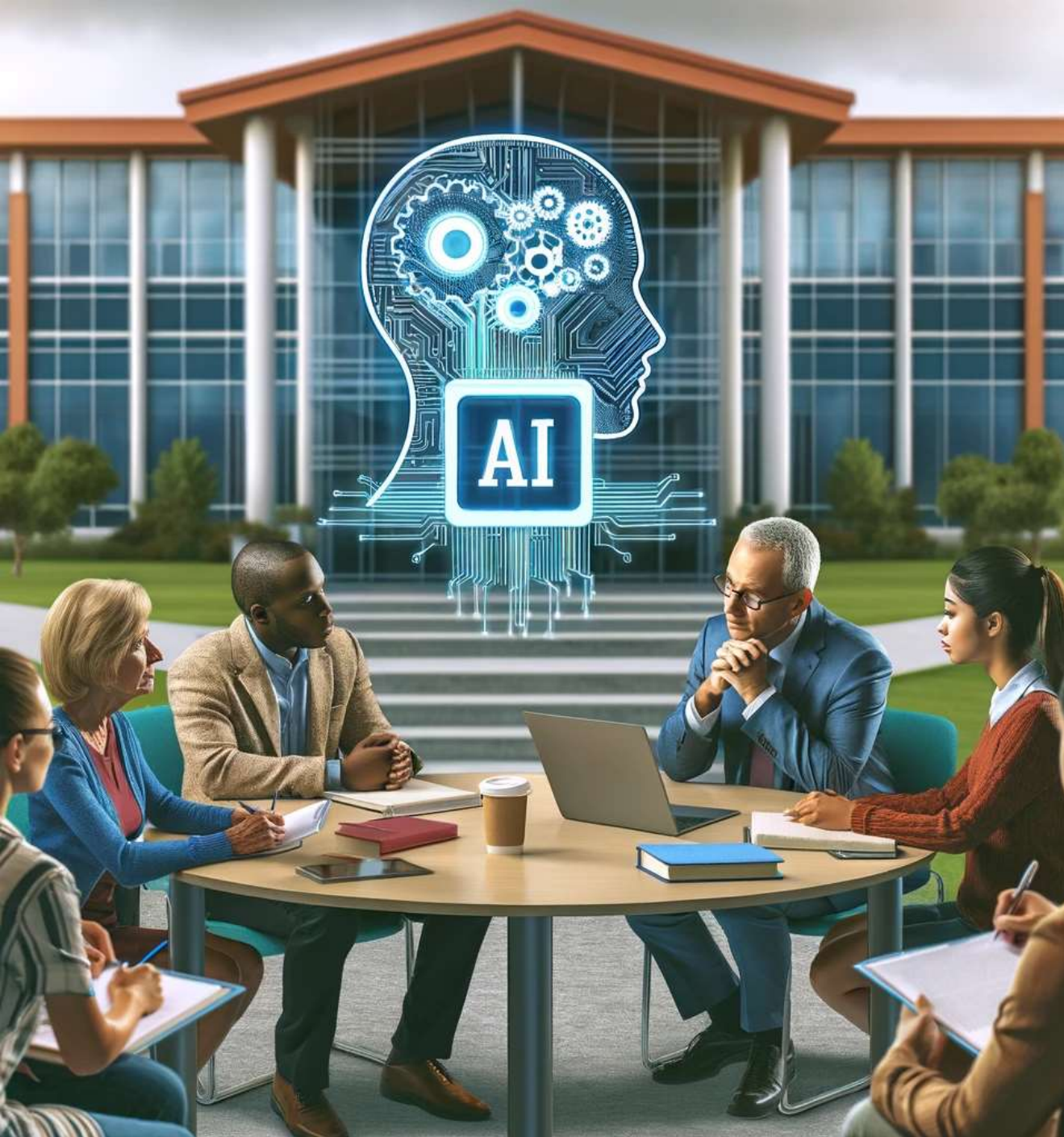
Authentic Learning in the AI Era

- **Multi-Phase Approach:** Break the assignment into stages (proposal, annotated bibliography, rough draft) to monitor student progress and understanding.
- **Annotated Bibliography:** Encourage deeper engagement by having students summarize and reflect on scholarly sources before writing.
- **Peer Review Process:** Facilitate collaborative learning through peer feedback on rough drafts, promoting accountability and refinement.
- **In-Class Presentation/Defense:** Add an oral component where students explain their work, ensuring they internalize and can articulate their ideas.



Authentic Learning in the AI Era






- **AI Usage Transparency:** Ask students to disclose if and how AI was used, fostering ethical AI engagement and self-awareness.
- **Emphasis on Process:** Focus assessment on both the learning journey (research, feedback, revision) and the final product.
- **Critical Thinking Integration:** Incorporate reflection questions or modern-day applications to encourage original student thought, less reliant on AI-generated content.



AI Policy Considerations

- Consider “Guidelines” over “Policy” while we navigate new waters.
- 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.

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>

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.

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

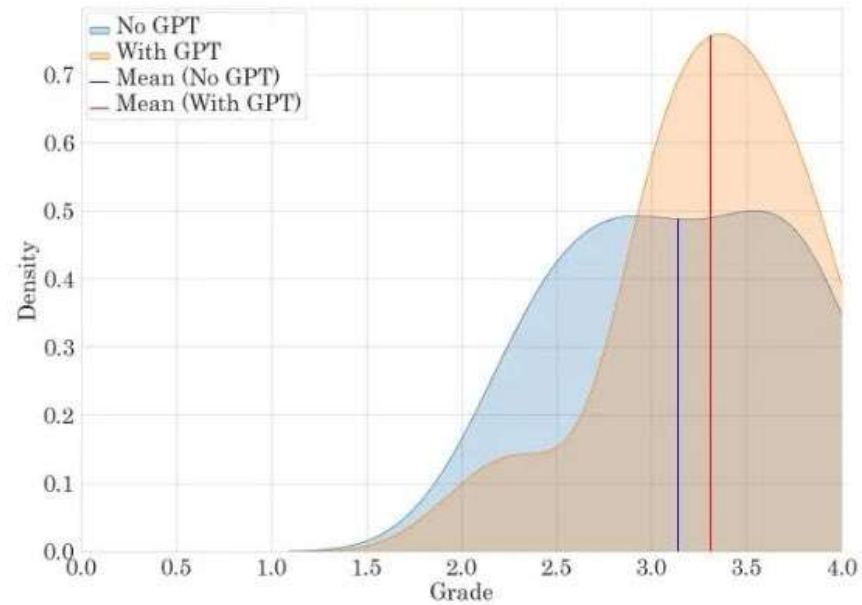
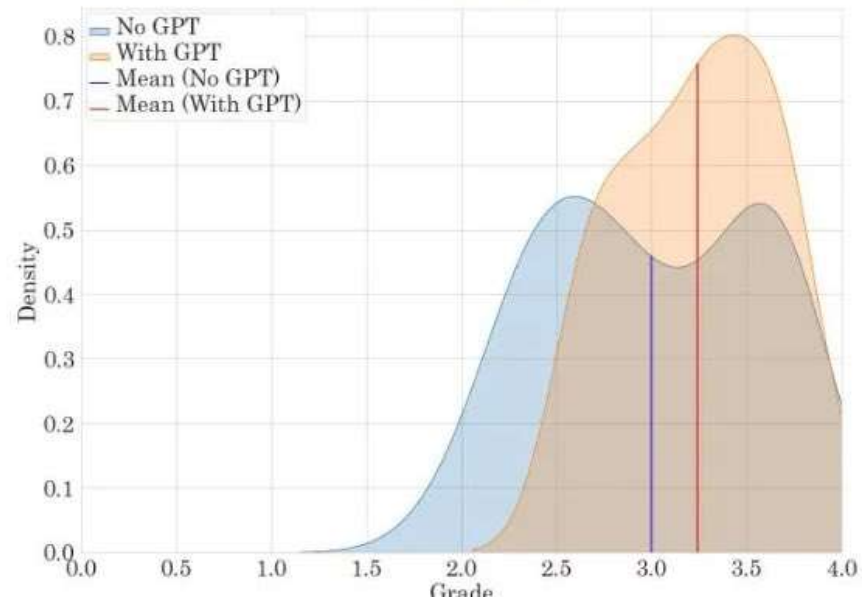


Figure 2: Quality Distributions with and Without AI—Contract Drafting



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>

Three Approaches to AI Adoption

- 1. Ignore and Avoid:** Skeptical, preserving traditional methods
- 2. Deny and Detect:** Focus on identifying AI misuse and concerned with cheating and ethical risks
- 3. Embrace and Enhance:** Integrate AI into teaching and supports collaboration and enhanced learning



Ignore and Avoid Approach

Ignores AI's presence in education

Avoids engaging with AI tools

Misses opportunities to adapt and innovate

Leaves students unprepared for AI-driven world

AI already influencing thought, work, and learning

Deny and Detect Approach

Concern: AI used for cheating and shortcuts



Blocking access and using AI detectors



Detection tech can produce false positives



Denial leaves students unprepared for AI-driven world



Doesn't align with preparing students for the future

Embrace and Enhance Approach

AI as a tool to
enhance
learning

Teaches
responsible AI
use

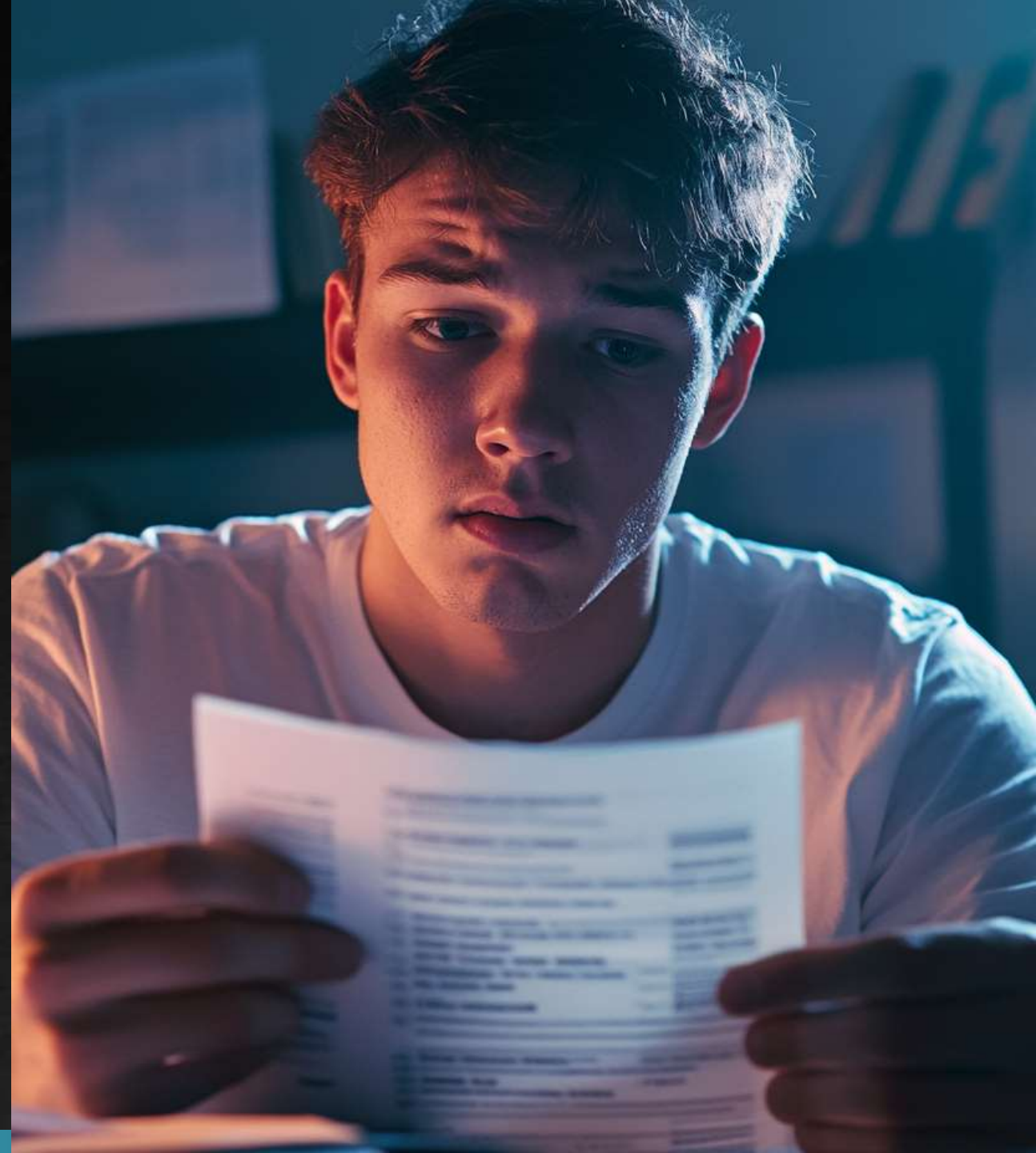
Encourages
critical thinking
and creativity

Students can
brainstorm and
critique with AI

Prepares
students for AI-
driven careers

Learning vs. Grades: The AI Impact

- Compare: 'C' student engaged and understands content
- Could be an 'A' student with AI as a tool
- AI can enhance learning, not replace it
- AI is integral to the world students are entering
- Our responsibility: prepare students for the future
- Thoughtfully integrate AI to guide responsible use



What Serves Students Best?

- Consider the three options:
 - Deny and Detect
 - Embrace and Enhance
 - Ignore and Avoid
- Focus on what will truly benefit students
- How can AI help prepare students for the future?
- Guide them responsibly toward success



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Thank you!
