# Generative AI:
## Using Gen AI to Talk About Gen AI

# John Graves
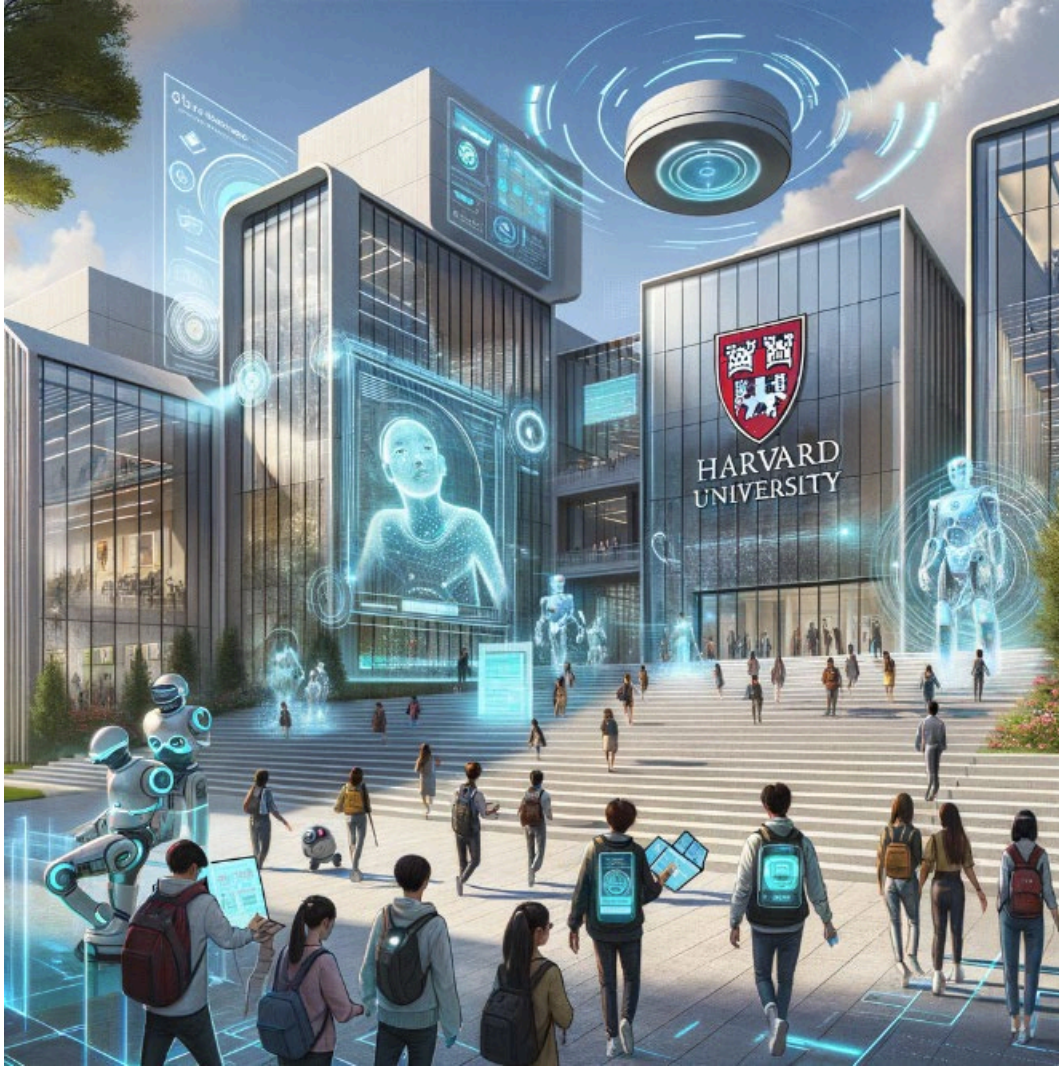
Associate Director of Academic Technology and Media Services
Harvard Chan School

Email: jgraves@hsph.harvard.edu

- Japanese American
- Educator
- Instructional Technologist / Instructional Designer
- Drummer
- Curious
- A Generative AI enthusiast, but not an expert



Retrieval 09112024,Dall-E-3.Prompt: "Could you make this picture look like a Hokusai woodblock print? "

# Where we are headed...

- Using Gen AI to Talk About Gen AI? (Prompt Engineering)
- The Harvard Generative AI Landscape: The Learner Perspective
- Next Steps
- Open discussion and Q&A

Retrieval 09112024, Dall-E-3. Prompt: Create an image that shows Generative AI at a futuristic Harvard University, Could you change the text "Ivy League University," to Harvard University?"
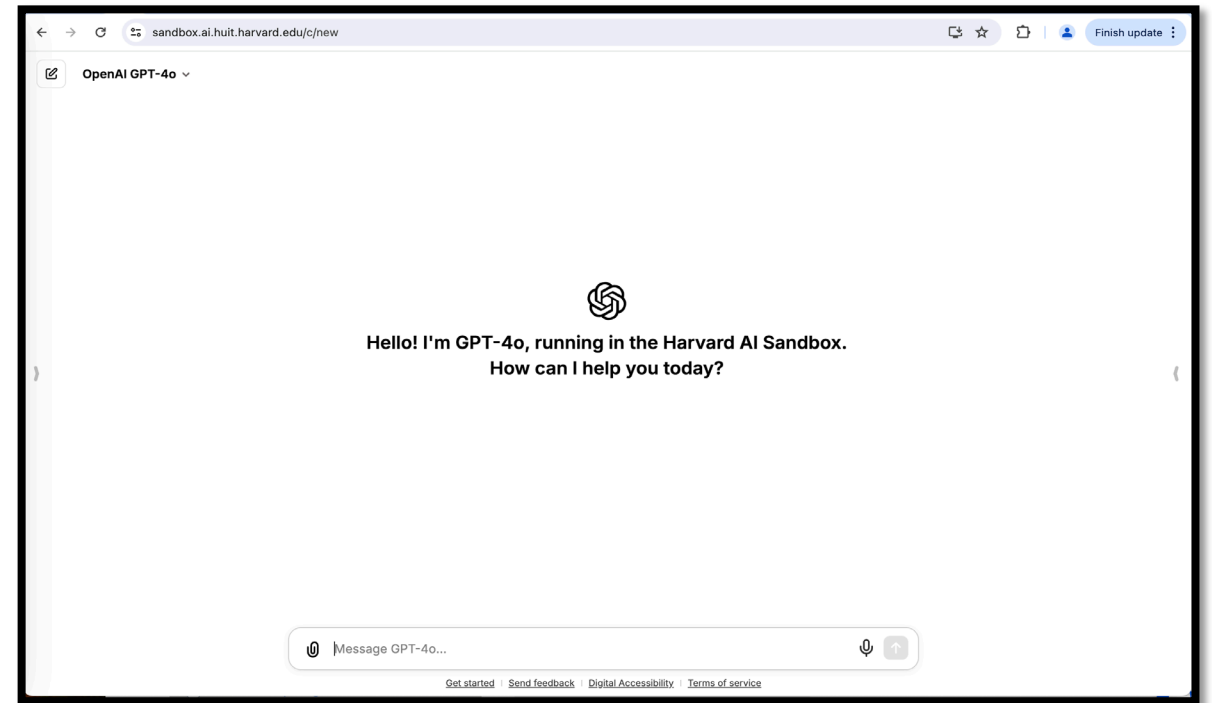
# What is Generative AI?

Retrieval 09112024, Dall-E-3. Prompt: Create an image set in modern Tokyo illustrating what Generative AI is.."
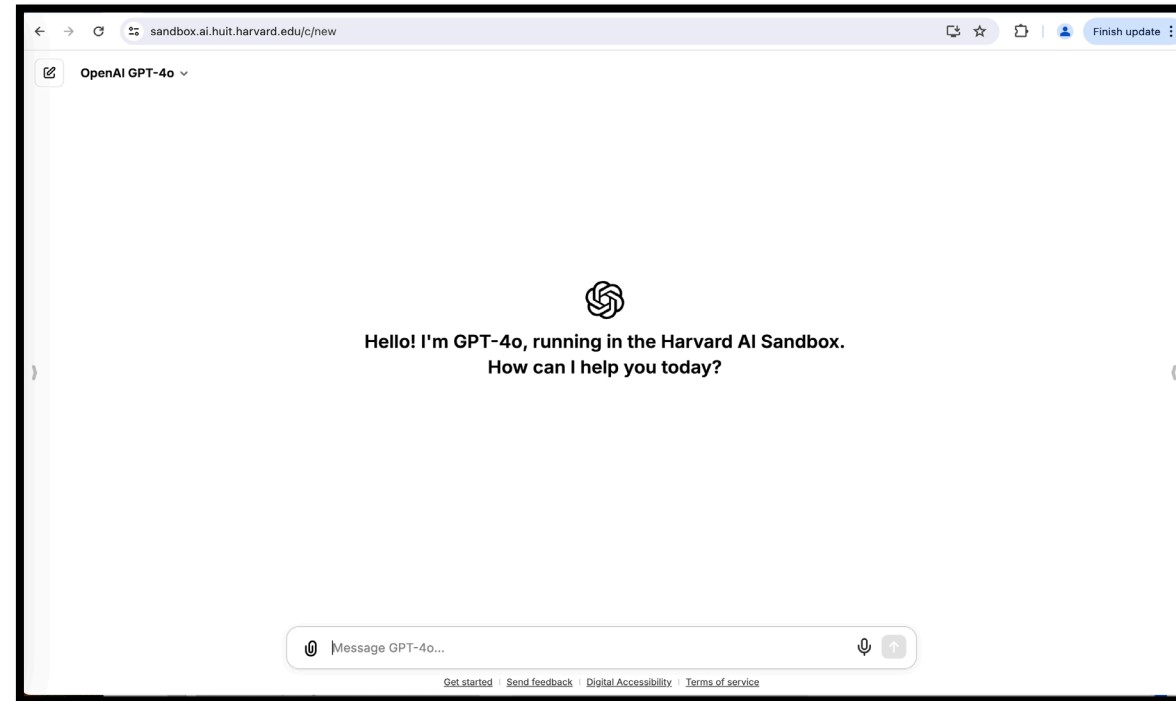
# What is Generative AI?: Defined with Gen AI

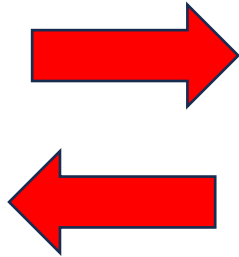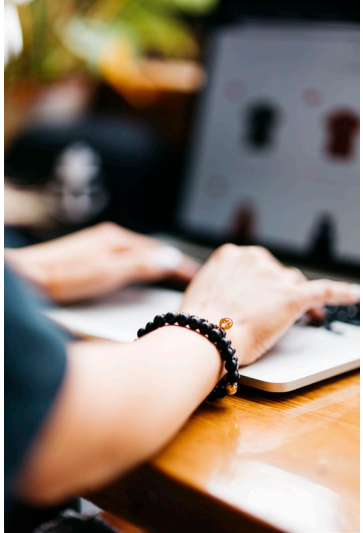Harvard AI Sandbox: https://huit.harvard.edu/ai-sandbox

- Developed a prompt and entered it into the site
https://huit.harvard.edu/ai-sandbox .
  - **The prompt:** What is Generative AI?

- Refined the definition using additional prompts
(Prompt Engineering)

Harvard AI Sandbox: https://huit.harvard.edu/ai-sandbox



Prompt: ChatGPT 4.0
What is Generative AI?

- Existing Data
- Training

Retrieval: 09112024 ChatGPT 4.0: Harvard AI Sandbox: Prompts:  What is Generative AI? , Could you define Generative AI in two sentences?, Could you make this definition so a wider audience could understand it?

# Prompt #1: What is Generative AI?

Generative AI refers to a subset of artificial intelligence (AI) techniques designed to create new content. This could include text, images, music, or other types of data. These systems leverage sophisticated algorithms and deep learning models to produce outputs that resemble those created by humans. Key technologies behind Generative AI include:

1. **Generative Adversarial Networks (GANs)**: Comprising two neural networks — a generator and a discriminator — that compete against each other. The generator tries to produce convincing data instances while the discriminator evaluates them for authenticity. Over time, this adversarial process helps the generator create highly realistic outputs.
2. **Variational Autoencoders (VAEs)**: These combine neural networks with probabilistic approaches to encode and decode data. VAEs are particularly useful for generating new data points that are variations of the input data.
3. **Transformer Models**: Especially prominent in the realm of natural language processing. Models like OpenAI's GPT-3 (Generative Pre-trained Transformer 3) can generate coherent and contextually appropriate text based on input prompts. **Applications of Generative AI:** 1. **Text Generation**: Generating articles, poems, answers to questions, and even computer code. 2. **Image Creation and Editing**: Producing realistic images or transforming existing ones (e.g., turning sketches into detailed pictures). 3. **Music Composition**: Creating new music pieces in various styles.
4. **Synthetic Data Generation**: Producing useful datasets for training machine learning models when real data is scarce or expensive to obtain.
5. **Creative Industries**: Assisting artists, writers, and designers in brainstorming and developing new concepts. Generative AI continues to evolve, pushing the boundaries of what machines can create, and has broad implications across various fields, including entertainment, medicine, and research.

# Prompt #2: Could you define Generative AI in two sentences?

Generative AI is a subset of artificial intelligence that uses algorithms, particularly neural networks, to create new content such as text, images, or music that mimics human creation. It leverages models like Generative Adversarial Networks (GANs) and Transformer models to generate data that is often indistinguishable from that produced by humans.
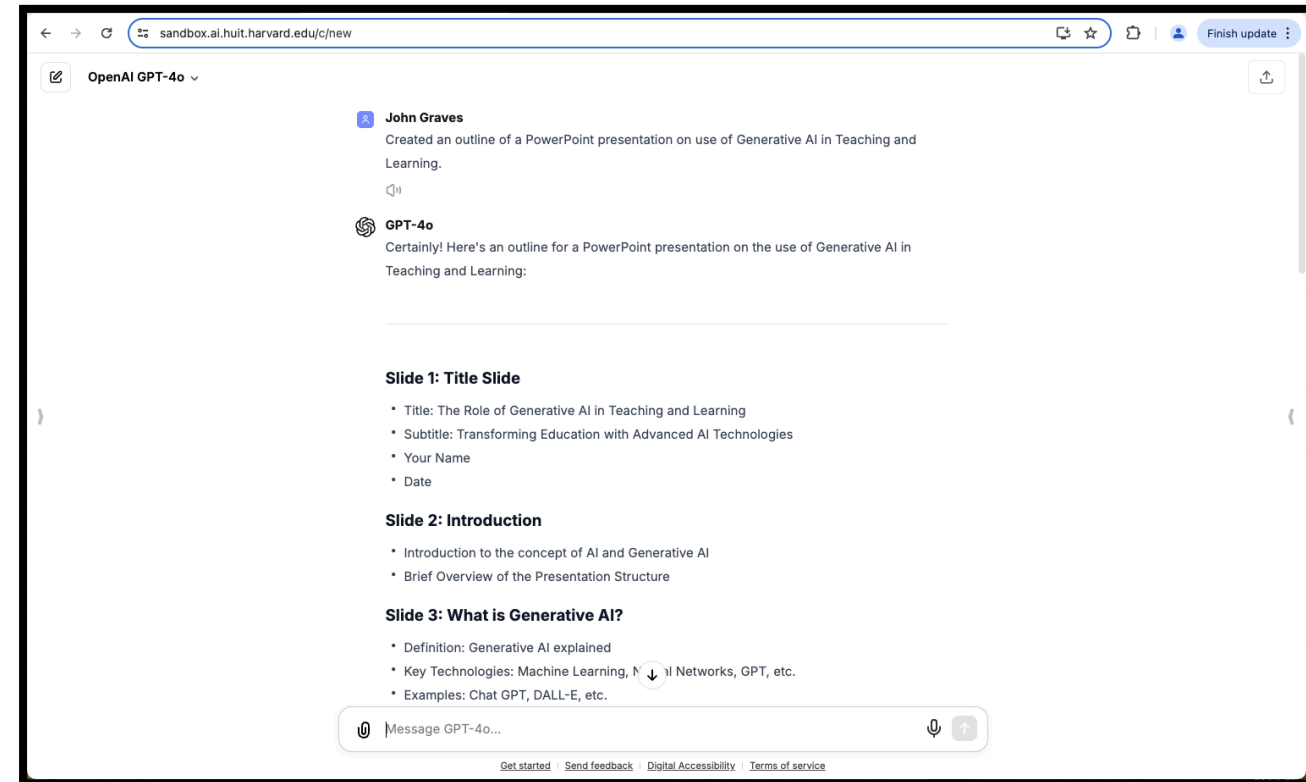
# Prompt #3: Could you make this definition so a wider audience could understand it?

Generative AI is a type of artificial intelligence that creates new content, such as writing stories, drawing pictures, or composing music, similar to what a human might make. It uses advanced computer programs to learn from existing data and produce realistic and creative outputs.

# The Presentation Outline Jumpstarted with Gen AI

Harvard AI Sandbox: https://huit.harvard.edu/ai-sandbox

- Developed a prompt and entered it into the site https://huit.harvard.edu/ai-sandbox .
  - **The prompt:** Created an outline of a PowerPoint presentation on use of Generative AI in Teaching and Learning.

- Entered the outline into the slides.

- Began my own research of the generated content to validate it and refine it.



Retrieval: 09112024 ChatGPT 4.0: Harvard AI Sandbox: Prompt: Created an outline of a PowerPoint presentation on use of Generative AI in Teaching and Learning.

Prompt: ChatGPT 4.0
Created an outline of a PowerPoint presentation on use of Generative AI in Teaching and Learning.

Certainly! Here's an outline for a PowerPoint presentation on the use of Generative AI in Teaching and Learning: ---

- Slide 1: Title Slide - Title: The Role of Generative AI in Teaching and Learning - Subtitle: Transforming Education with Advanced AI Technologies - Your Name -
- Slide 2: Introduction - Introduction to the concept of AI and Generative AI - Brief Overview of the Presentation Structure
- Slide 3: What is Generative AI? - Definition: Generative AI explained - Key Technologies: Machine Learning, Neural Networks, GPT, etc. - Examples: Chat GPT, DALL-E, etc.
- Slide 4: Generative AI in Education - How Generative AI is being applied in education - Current trends and applications
- Slide 5: Enhancing Teaching with Generative AI - Automating Administrative Tasks: Grading, Attendance, Scheduling - Personalized Learning: Tailored content generation - Tutoring and Mentoring: AI-driven tutoring systems
- Slide 6: Enhancing Learning with Generative AI - Content Creation: Interactive and immersive content (text, audio, video) - Simulations and Scenario-Based Learning: Virtual labs, Situational simulations - Adaptive Learning Systems: Real-time feedback and adjustments
- Slide 7: Case Studies - Examples of schools, universities, or educational platforms using Generative AI - Success stories and outcomes
- Slide 8: Advantages of Generative AI in Education - Efficiency: Saving time for educators - Personalization: Catering to individual student needs - Engagement: Making learning more interactive and engaging
- Slide 9: Challenges and Considerations - Ethical Concerns: Bias, Privacy, Data Security - Implementation Barriers: Cost, Infrastructure, Training - Limitations of Current Technologies
- Slide 10: Best Practices for Integrating Generative AI - Steps for educators and institutions to implement Generative AI - Collaborations: Partnering with EdTech companies - Continuous Training and Development for Educators
- Slide 11: Future Trends and Opportunities - Emerging Technologies: Advancements in AI - Long-term Impact on Education: Predictions and possibilities
- Slide 12: Q&A - Open Floor for Questions and Discussion
- Slide 13: Conclusion - Recap of key points - Closing remarks - Contact Information --- This outline provides a structured approach to discussing the impact and potential of Generative AI in teaching and learning. Feel free to adjust the content according to your audience and presentation goals.
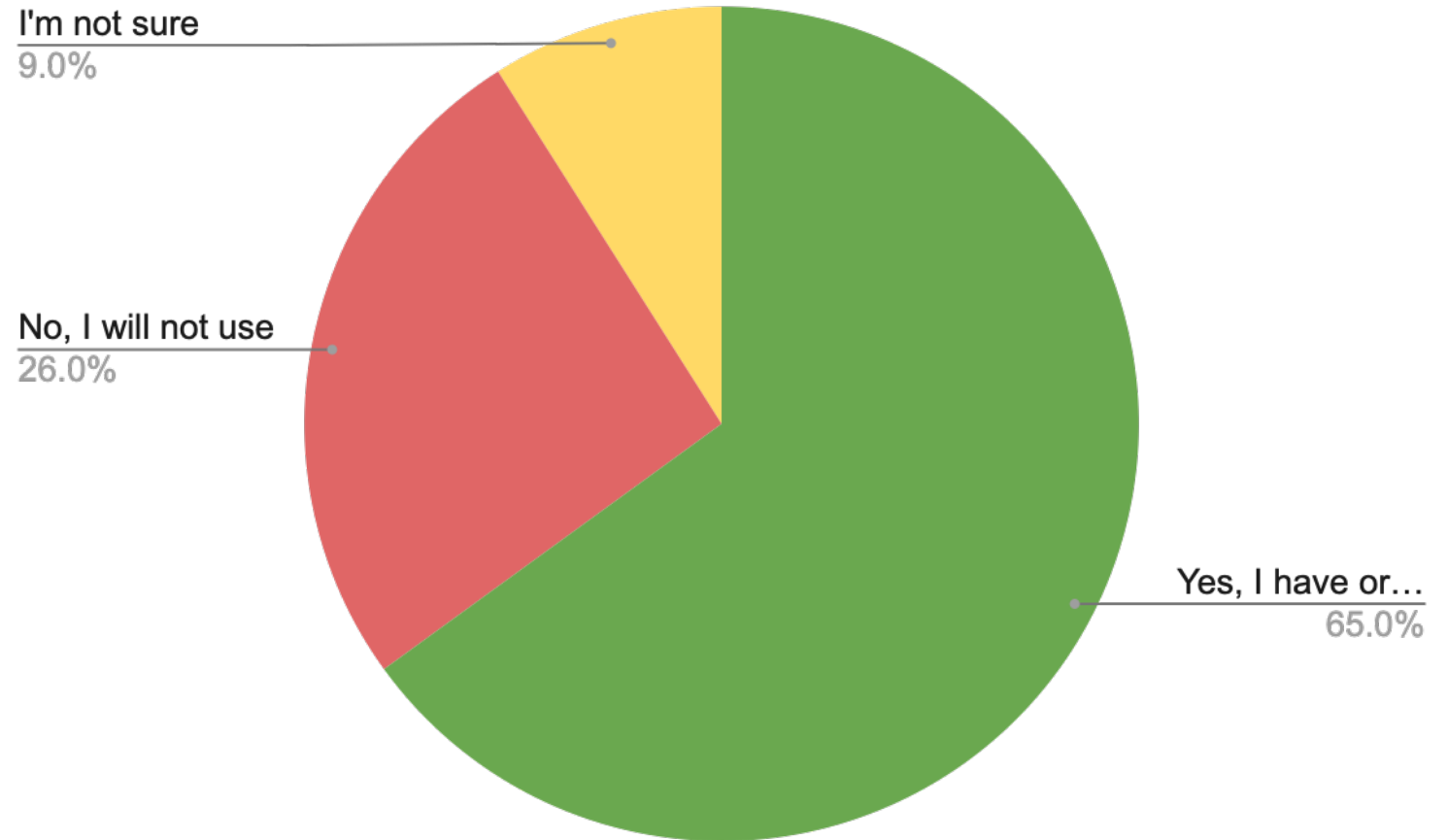
# The Harvard Generative AI Landscape: The Learner Perspective

Retrieval 09112024: Dall-E-3. Prompt: Create an image that illustrates Generative AI at Harvard University." .

# Fall 2023 Survey of 350+ Harvard Students

## 65%

of students say they use or plan to use generative AI for academic work.



I'm not sure
9.0%

No, I will not use
26.0%

Yes, I have or…
65.0%

# How students use ChatGPT for academic work

- To summarize text of readings
- To suggest specific improvements to or edit writing
- To do a preliminary search for information & beginning lit reviews
- To get a quick definition (when the context or source doesn't matter)

- As a learning partner to understand a new topic or concept
- As a brainstorming partner
- As a language translation tool
- For help with coding

Key Insight:
# *Use of ChatGPT as a Learning Partner*

**"I'm in a really hard Physics class and I've been using ChatGPT to explain Physics concepts to me. If I don't understand something it is helpful to have it described to me in different ways. It can quiz me or debate with me. Sometimes it is more helpful than the way it is defined in the lecture."**

– Junior, History of Science & Global Health

Key Insight:
# *Evaluating research impact & importance*

**"I don't think I would use ChatGPT for finding sources directly. But if my question was something like tell me about the five biggest findings in reinforcement learning in the past decade, I'd use it. It would help me figure out who the major researchers are in the space and could suggest keywords for I can use."**

–Junior, Neuroscience

# Next Steps?



- Get a Harvard AI Sandbox account
- Start small
- Be curious and have fun

# AI Around Harvard and Cambridge

- AI at Harvard Chan
Harvard T.H. Chan School of Public Health
https://www.hsph.harvard.edu/information-technology/generative-ai-at-harvard-chan/

- Embracing Artificial Intelligence in the Classroom:
Harvard Graduate School for Education
https://www.gse.harvard.edu/ideas/usable-knowledge/23/07/embracing-artificial-intelligence-classroom

- Artificial Intelligence at Harvard Kennedy School (HKS)
Harvard Kennedy School
https://www.hks.harvard.edu/artificial-intelligence

- Generative AI in Teaching and Learning:
Harvard Office of the VPAL
https://www.youtube.com/playlist?list=PL_kRkvxqHjkqjnhAdSdejAkyQf1TnPkNM

- AI Hub: Generative AI for Teaching and Learning:
MIT Sloan
https://mitsloanedtech.mit.edu/ai/

# Thank You



## John Graves

jgraves@hsph.harvard.edu
Associate Director of Academic Technology and Media
Services HSPH

- Japanese American
- Educator
- Instructional Technologist / Instructional Designer
- Curious
- A Generative AI enthusiast, but not an expert

Retrieval 09112024,Dall-E-3.Prompt: "Could you make this picture look like a Hokusai woodblock print? "