

# From Wow to How: Unleashing Human Brilliance with AI

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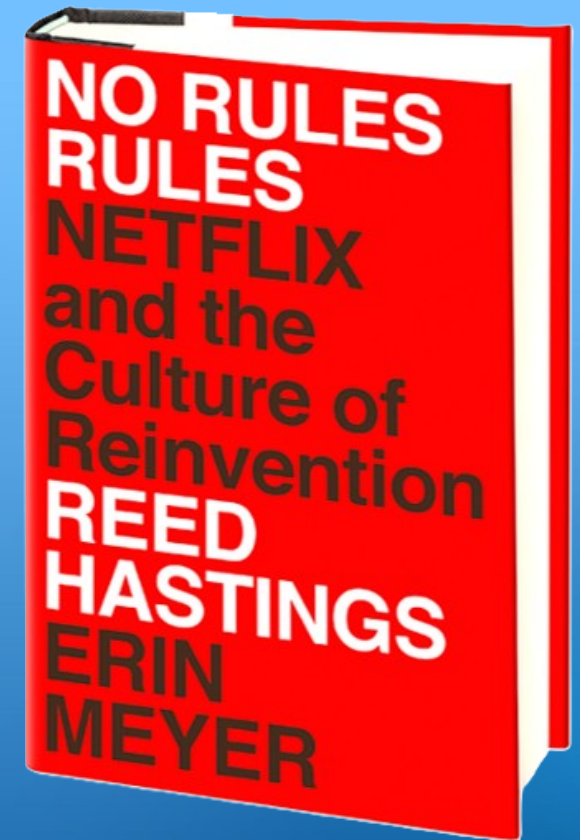


*Image generated by AI*

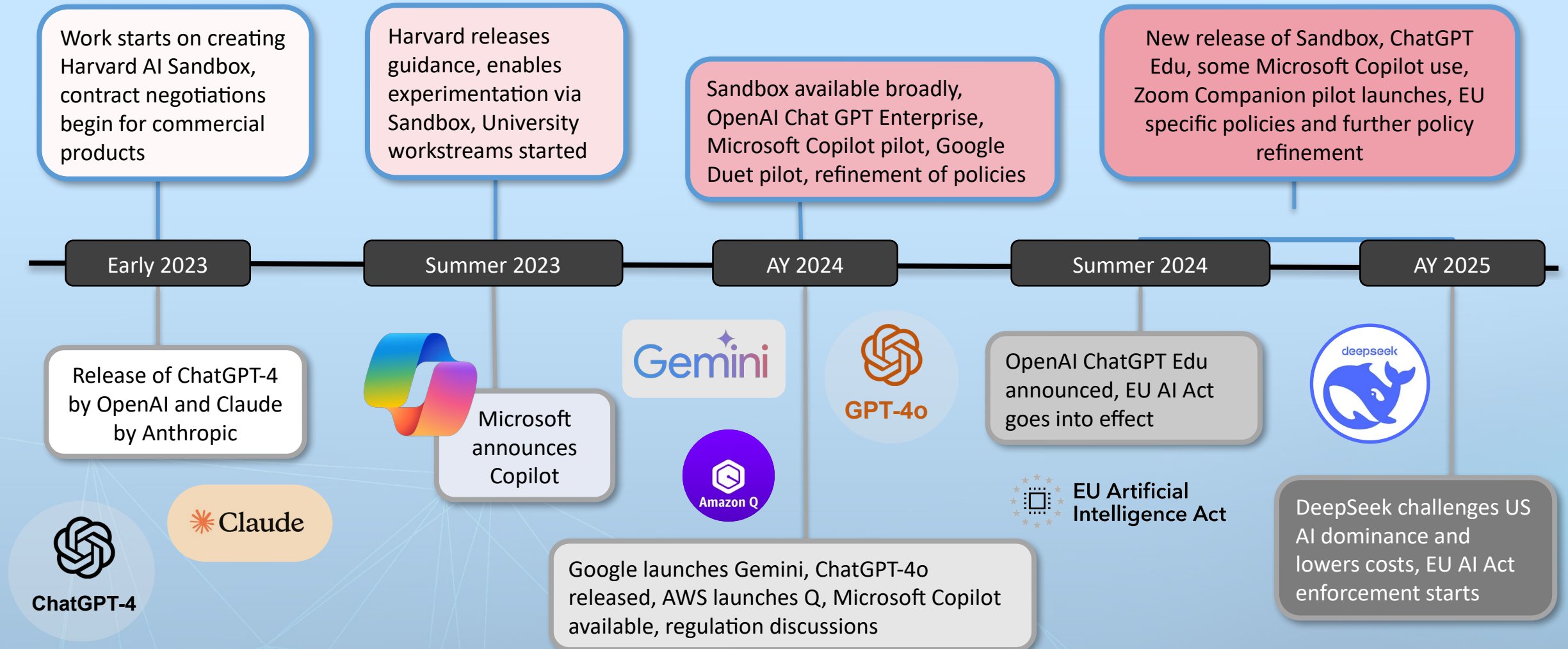


# Framework for Innovation

- Exponential change demands resilient frameworks that support innovation
  - Responding nimbly and successfully external and internal industry shifts (Netflix, Harvard)
- Harvard's policies that apply to AI are built around principles – open inquiry, human agency, ethics, transparency, security and privacy
- Modeling ethical AI adoption that reflects Harvard's role as a global leader in education and research



# Harvard's Timeline Within the Technology World



# Operational Excellence



# Two Modes of AI Investment at Harvard

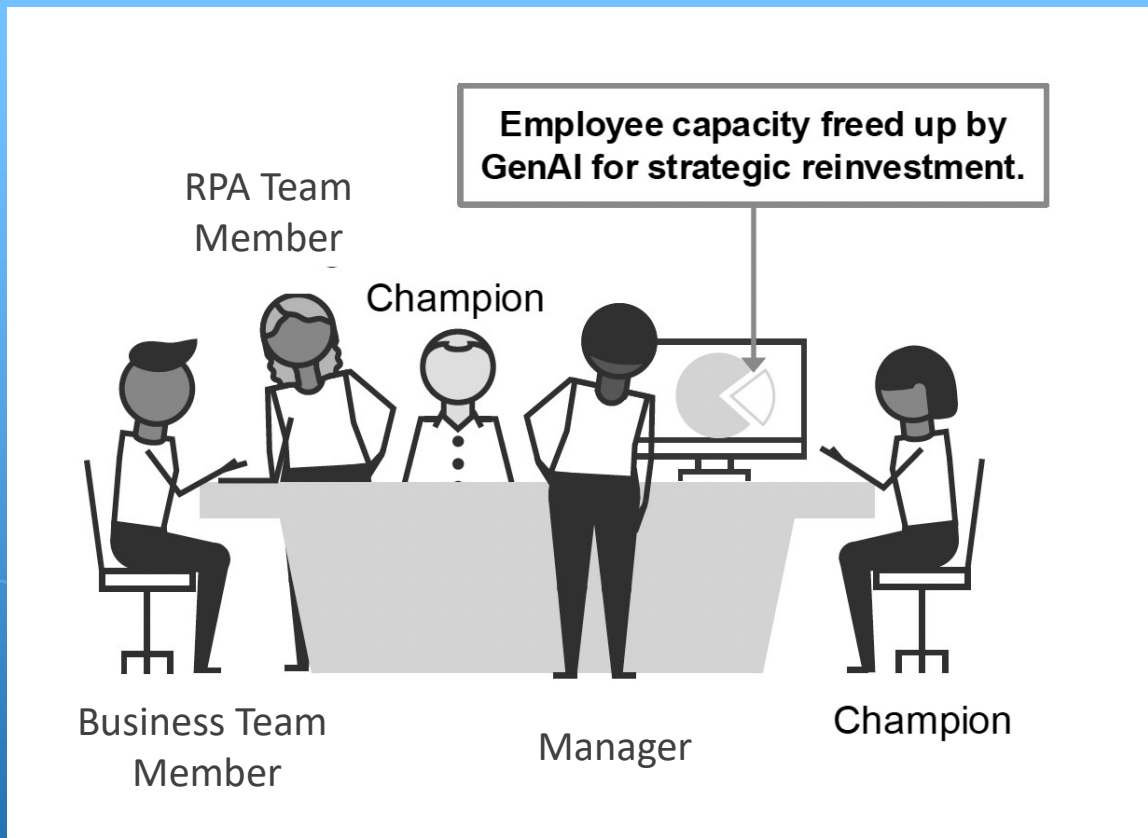
## General AI Deployment – Enhancing Productivity

- Supports faculty, staff, and students in everyday tasks
- Improves individual's efficiency (researching a topic, document creation, communication, summarization of information, data analysis)
- ROI is qualitative and hard to measure - time saved, better decision-making, improved collaboration

## AI Use for Process Redesign and Automation – Cost Savings

- Targeted projects that automate administrative and operational functions
- Generates measurable cost savings by reducing labor-intensive tasks
- ROI is established up front: direct reductions in labor costs, improved efficiency or faster workflows

# Empower Employees to Co-create and Learn by Doing



- Cross functional IT – Business Team allows employees to learn and immediately apply their learning
- IT team members teach business champions on how to develop, test and deploy bots
- Employees apply learning immediately and see results of their work quickly
- Employees learn new valuable skills
- Digital transformation is completed within current FTE footprint



## Impact – Reducing Administrative Overhead While Empowering Individuals and the Team

“

Hello friends,

Just wanted to tell you that we deployed the **bots** yesterday and they have been a **total success!!!** Our team is **totally impressed with the amount of work that the bots have saved them.**

Thank you to all of you for your help and support. Special thanks to Aditi (IT) for your guidance, for teaching new things and how to do things differently - I couldn't have done it without your help. And, of course, thank you Arvind (IT) for helping our team install [AI and Automation Tool] and make it possible for them to run the bots!

**My learning continues.**

Thanks again,

Carlos (Citizen Developer)

”



**Operational excellence is not peripheral—it is mission-critical.** By optimizing operations, universities can reinvest in what matters most: **teaching, learning, and discovery.**

**AI is a key enabler.**

# Tailoring Learning Experiences

## Harvard's Approach



# Learning Science Principles

Guiding the development and use of AI tools to support education



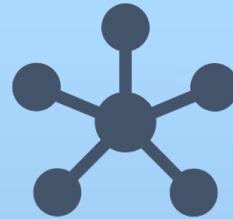
## **Inspire Active Learning**

Help students acquire and organize knowledge



## **Manage Cognitive Load**

Present relevant, well-structured information



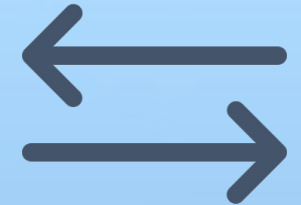
## **Deepen Metacognition**

Plan, monitor, and help students reflect on progress



## **Stimulate Curiosity**

Inspire engagement through learning journey



## **Adapt to Learner**

Dynamically adjust to students' goals and needs

# Tutorbots and Adaptive Learning Technologies

AI-powered tutorbots simulate human-like interactions, offering explanations, answering questions, and guiding students through complex material. These tools operate 24/7 and can adapt based on student inputs.

## Supporting diverse educational backgrounds

- Tailored learning experiences
- Language inclusivity and natural language interfaces
- Judgment-free clarification

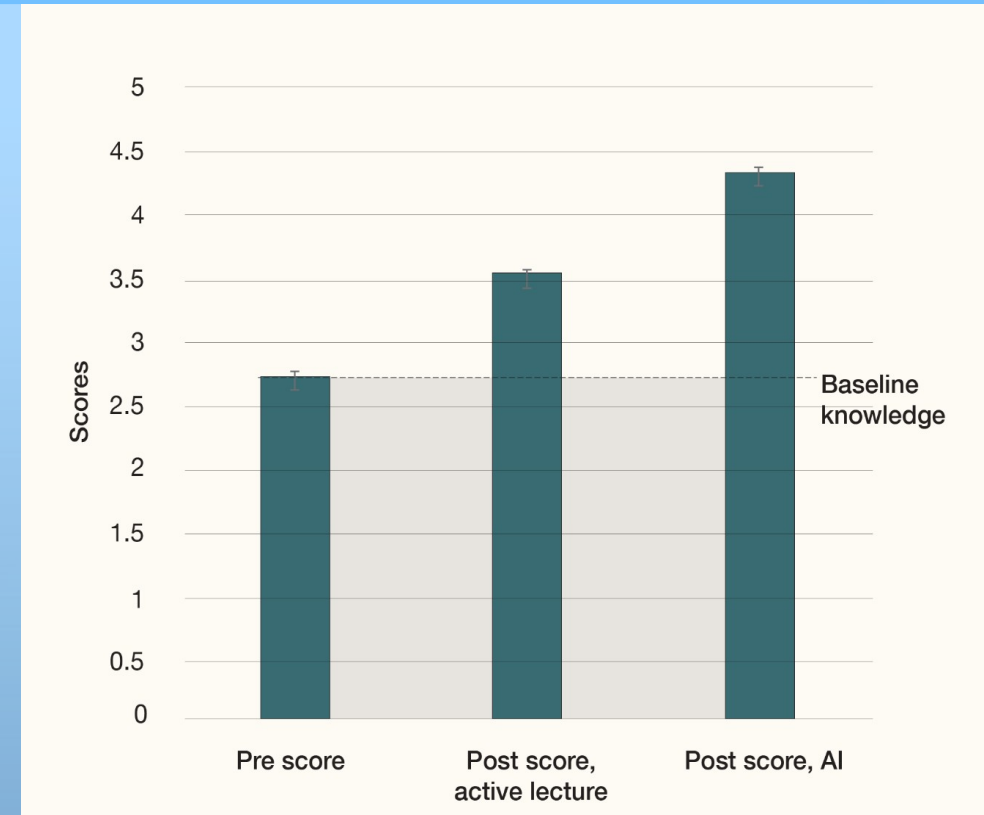
## Enhancing Instructional Equity

- Scalable, personalized support
- Closing the opportunity gap – compliment faculty especially for students less likely to seek help

# Tutorbots at Harvard

## Gregory Kestin and Kelly Miller's PS2Pal for Gateway Physics Course

- Using a custom tutorbot had a positive impact on student outcomes
- Student engagement and motivation were increased
- Class time was freed up for developing “higher-order skills, such as advanced problem-solving, project-based learning, and group work”



Manning, A. J. (2024) Professor tailored AI tutor to physics course. Engagement doubled. Harvard Gazette.  
<https://news.harvard.edu/gazette/story/2024/09/professor-tailored-ai-tutor-to-physics-course-engagement-doubled/>



# Personalization at Scale

AI tools enable scaled personalized support for large or online enabling instructors to:

- See where the pedagogical approaches are connecting—or not
- Improve clarity or add resources where needed
- Suggest adjustments based on evidence



## The CS50 Duck

- An AI-powered chatbot introduced in 2023 for an introductory computer science course at Harvard.
- A virtual teaching assistant: checks students' code and answers course-related questions

*"Quacking" into computer programming.* (2024, January 30). Harvard.edu.  
<https://seas.harvard.edu/news/2024/01/quacking-computer-programming>

# HUbot: A Chatbot LTI Tool

- Harvard wide infrastructure tool allowing instructors to create customized AI chatbot for the classroom
- Fully integrated into the learning management system
- Faculty are in control of materials and whether the bot is used
- Students explore concepts and materials specific to the course being confident that HUbot is drawing upon authoritative documents provided by the course instructor

# Tutorbots as Cognitive Partners - What can they mean for adult learning and continuous upskilling?

| What AI Enables                   | Why It Matters                   | Aligns With Societal Needs                                        |
|-----------------------------------|----------------------------------|-------------------------------------------------------------------|
| On-demand and multilingual access | Flexibility for working learners | Lifelong, modular learning                                        |
| Instructor-curated content        | Trust and academic alignment     | Trusted, authoritative, pedagogically sound approaches and design |
| Adaptive feedback                 | Personalized, scalable support   | Inclusion across diverse learner profiles                         |
| Learning systems integration      | Improved experience              | Embedded in existing institutional, corporate or national systems |



**AI tutorbots are not replacing educators. They are scaling insight, deepening engagement, and enabling lifelong learning and individual growth.**

# AI and Academic Excellence

# Critical Skills for the Future

## Differentiated impacts

### Faculty

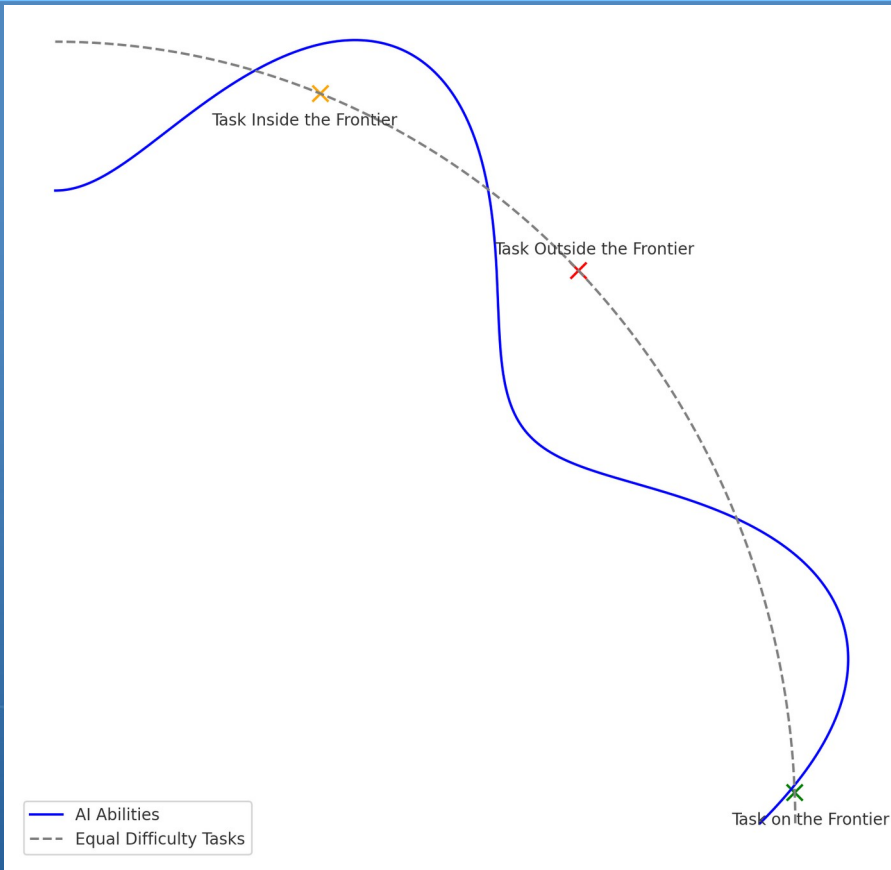
- Accelerated research and knowledge production
- Unlocking individual academic potential
- Shifts in scholarly identity

### Students

- Workforce readiness for AI era
- Exposure to emerging technologies and foundational knowledge
- Individualized, adaptive learning pathways



# Navigating the AI Frontier (April 2025)



## Inside Frontier

Writing essays

Outlining historical events

Taking on different  
personas

## Outside Frontier

Spelling words correctly on  
AI generated pictures

Accurate empirical  
evidence (curated)

Metacognition (e.g. label  
grammatical terms –  
metalanguage)



# Active Faculty Discussion

- Technology shifts are occurring faster and have differentiated impact across disciplines
- Key decision: Integrate AI or establish a thoughtful GAI policy (course-based approach)
  - Impact on assessment - writing as a proxy to learning
- Support
  - Broad support – technology teams
  - Individualized support and pedagogical needs - teaching and learning centers

Stephen Chong:  
GenAI as a peer  
learner



Feb 14, 2024

Jacob Cook:  
Using GenAI to  
reduce plagiarism



Feb 13, 2024

Louis Deslauriers:  
Understanding  
student learning  
in real-time



Feb 12, 2024

Maria Dikcis:  
Appreciation for  
the human  
perspective



Feb 10, 2024

Jose Luis García  
del Castillo y  
López:  
Augmenting the  
design processes  
and enhancing the  
creative process



Feb 8, 2024

David  
Dockterman:  
Harnessing GenAI  
as a collaborative  
tool in educational  
problem-solving



Feb 7, 2024

Sharad Goel:  
Building an AI  
Slackbot to tutor  
students



Feb 6, 2024

Greg Kestin:  
Introducing  
concepts at  
students' pace



Feb 4, 2024

Rem Koning:  
Using ChatGPT  
to assist with  
feedback



Feb 2, 2024

Dan Levy:  
Understanding  
student learning  
in class



Feb 1, 2024

Nicole Mills: Using  
GenAI to create  
interactive games



Jan 31, 2024

Daniele Olveczky:  
Using GenAI  
images as  
teaching tools



Jan 30, 2024

# If AI ...



is a tutor, TA



is a role play partner or adversary



builds simulations



gives project feedback



develops problem sets



answers course administrative questions



is a peer student, collaborator, contributor



helps with data analysis



creates content (video, graphics, music)



translates



codes

## What is our role?

# Support For Faculty Through Dialogue



## FEATURED EVENT

### Teaching Critical Reading & Writing in the Age of AI: Digital Storytelling

Thursday, April 24, 12-1 pm  
Barker Center, Room 133  
12 Quincy Street



Home /

## Teaching with Integrity in the Age of AI

📅 March 31, 2025 ⌚ 12:00 pm - 2:00 pm 📁 AI, GAI Dialogues series

🔖 Add To: Google Calendar | Outlook | iCal File 📄 Download iCal file for this event

## Preparing Students for the Future: AI Literacy in the Liberal Arts

📅 May 5, 2025 ⌚ 2:00 pm - 3:00 pm 📁 AI, GAI Dialogues series

🔖 Add To: Google Calendar | Outlook | iCal File 📄 Download iCal file for this event

### Original Thought in the AI Era: A Faculty Dialogue on Authorship and Ethics

The panel explored how generative AI is reshaping academic authorship, originality, and ethical responsibility in research. Faculty panelists discussed the challenges and opportunities AI presents in defining plagiarism, enhancing creativity, and rethinking the role of human contribution in scholarly work.

[Watch the March 13 Event](#)





# Ongoing Engagement Beyond the Classroom – An Opportunity to Embed the University More Deeply to the Fabric of the Society

## **Example: HBS Foundry's AI Enabled Entrepreneurship**

- AI-Driven Entrepreneurial Support
- Interactive Learning Simulations
- Personalized Learning Pathways
- Community and Mentorship Access



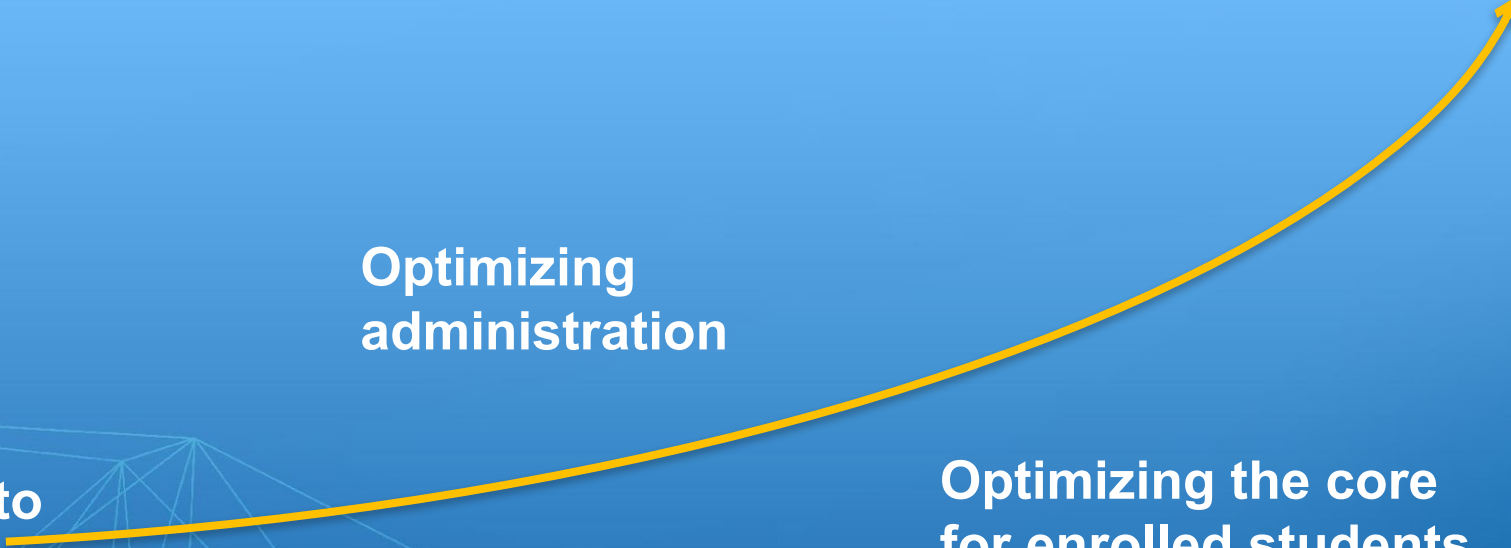
# Increased Productivity Allows Scale

Embedded economic partner,  
anchored in societal fabric  
extending its reach

Optimizing  
administration

Optimizing the core  
for enrolled students

Extending reach to  
new populations



# Educators and AI: Designing the Future Together

*AI is expanding the capacity of humans –  
not replacing them.*

*AI can enhance what universities can be:  
from ivory tower to societal enabler*



# Thank you!

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