GEORGE MASON UNIVERSITY

State of AI in Higher Education

What This Moment Requires of Universities

University Lecture, Texas State University, October 29, 2026

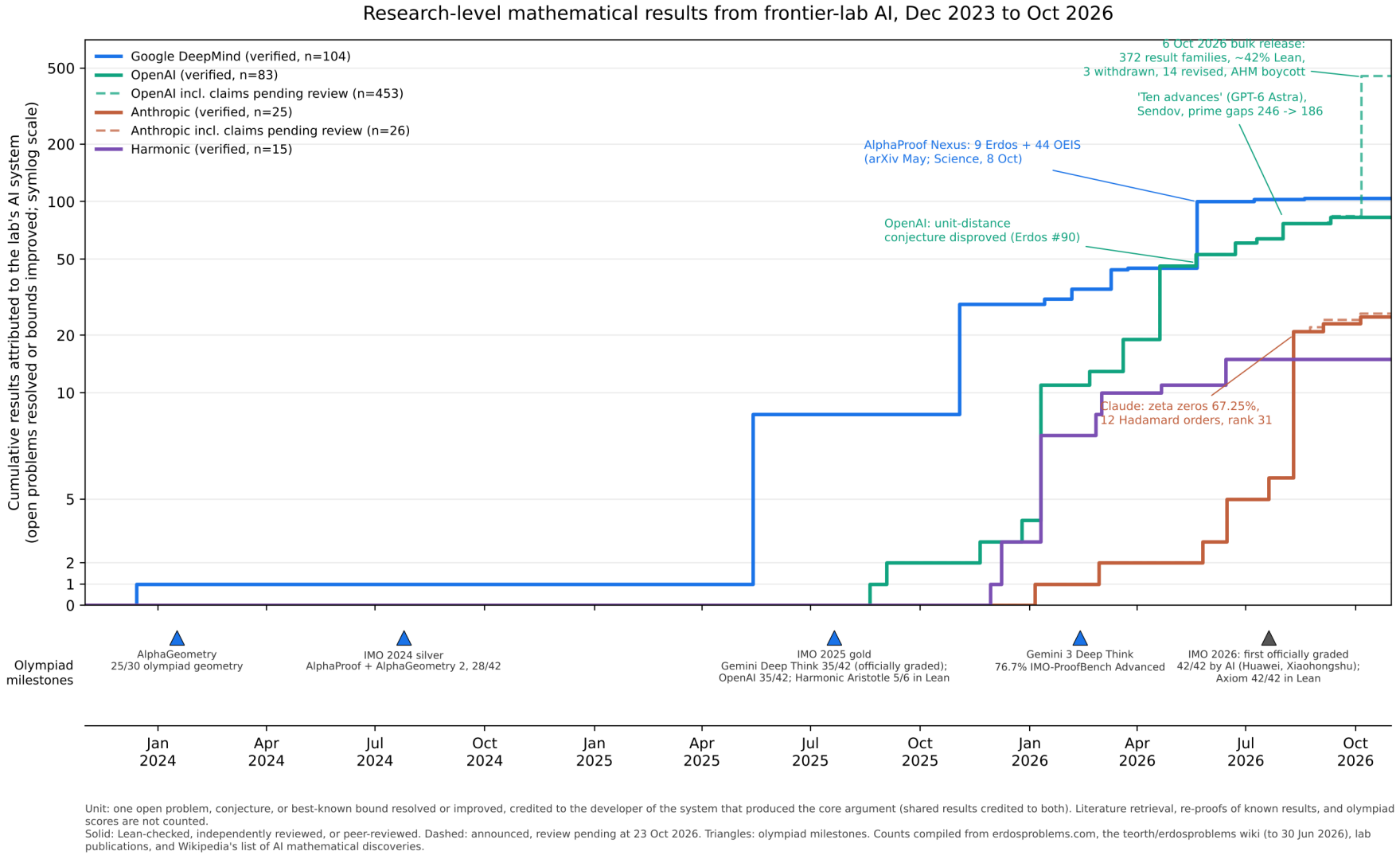
Amarda Shehu

Professor of Computer Science, School of Computing
Associate Dean for Research, College of Engineering and Computing
Vice President and Chief AI Officer

The views in this talk are mine alone. They do not reflect the positions of George Mason University or any other organization with which I am affiliated.

We start with honesty: a chart that captures the times.

Meta: “generate a plot that tracks the growth in the number of mathematical theorems or conjectures proved or disproved from the frontier labs with AI. X axis should track time. Color-coding may be used to indicate which companies. Include Google and their Olympiad efforts.” Prompt to Anthropic Fable 5.1 on Oct 23, 2:41pm, 2026

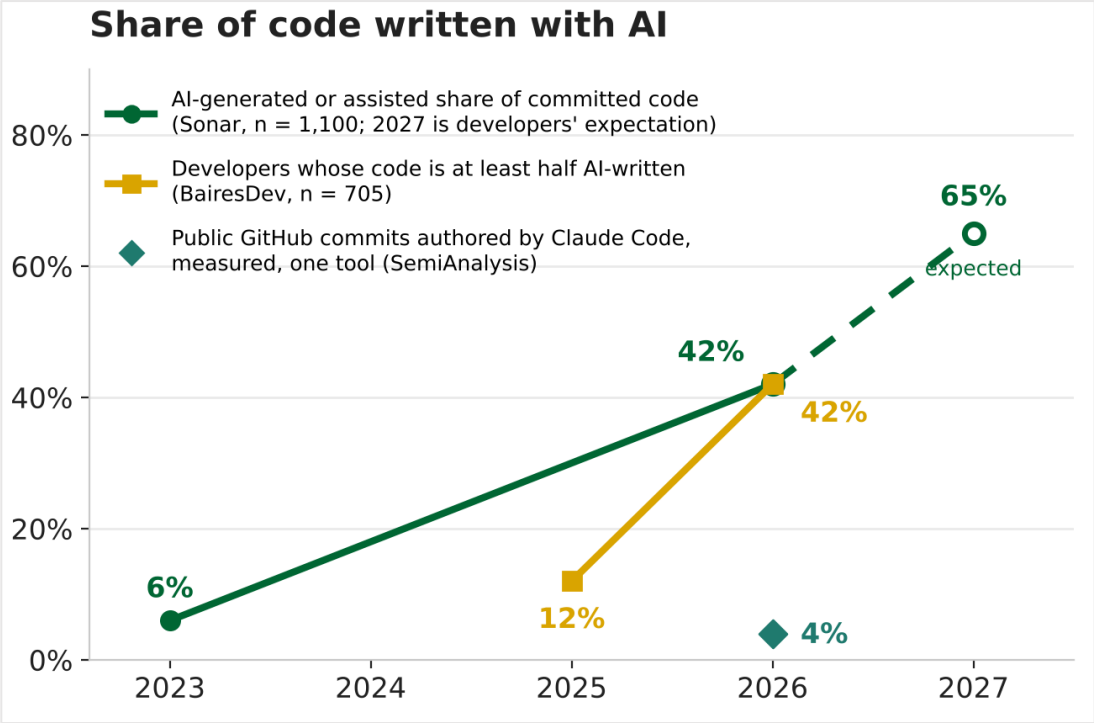


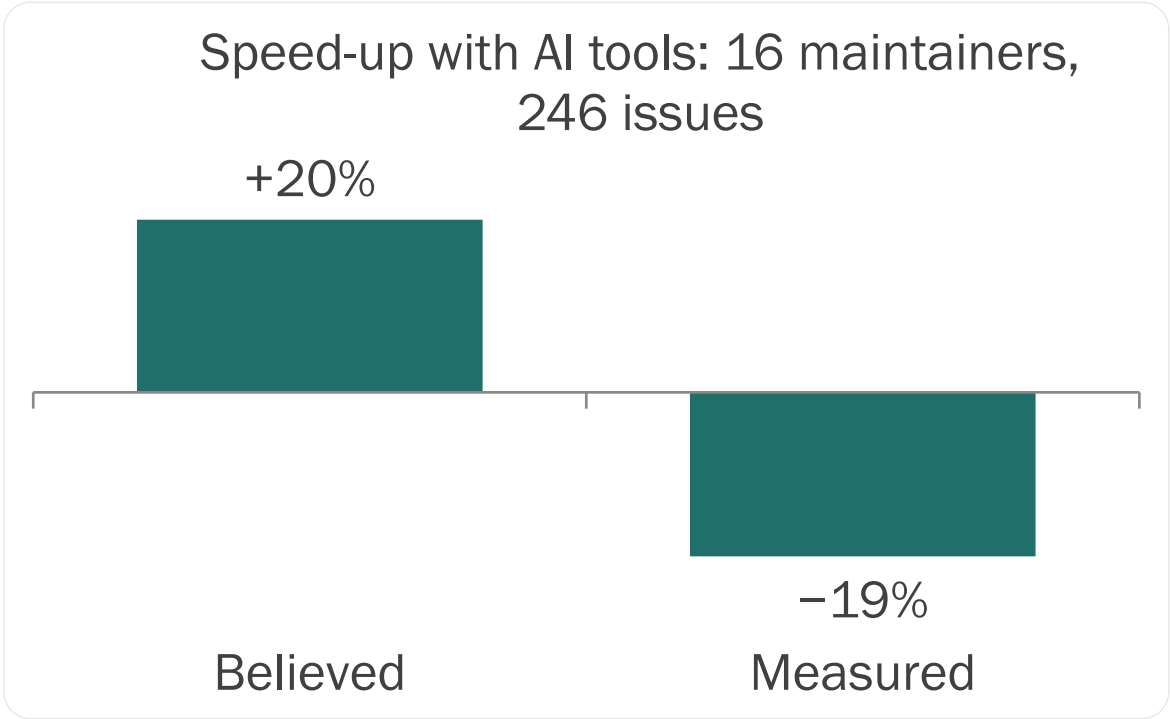
Part I. What the agents deliver



Raphael, The School of Athens.. Euclid bent over a slate with his compass while four young men crowd in to watch the construction.

It Started with Code





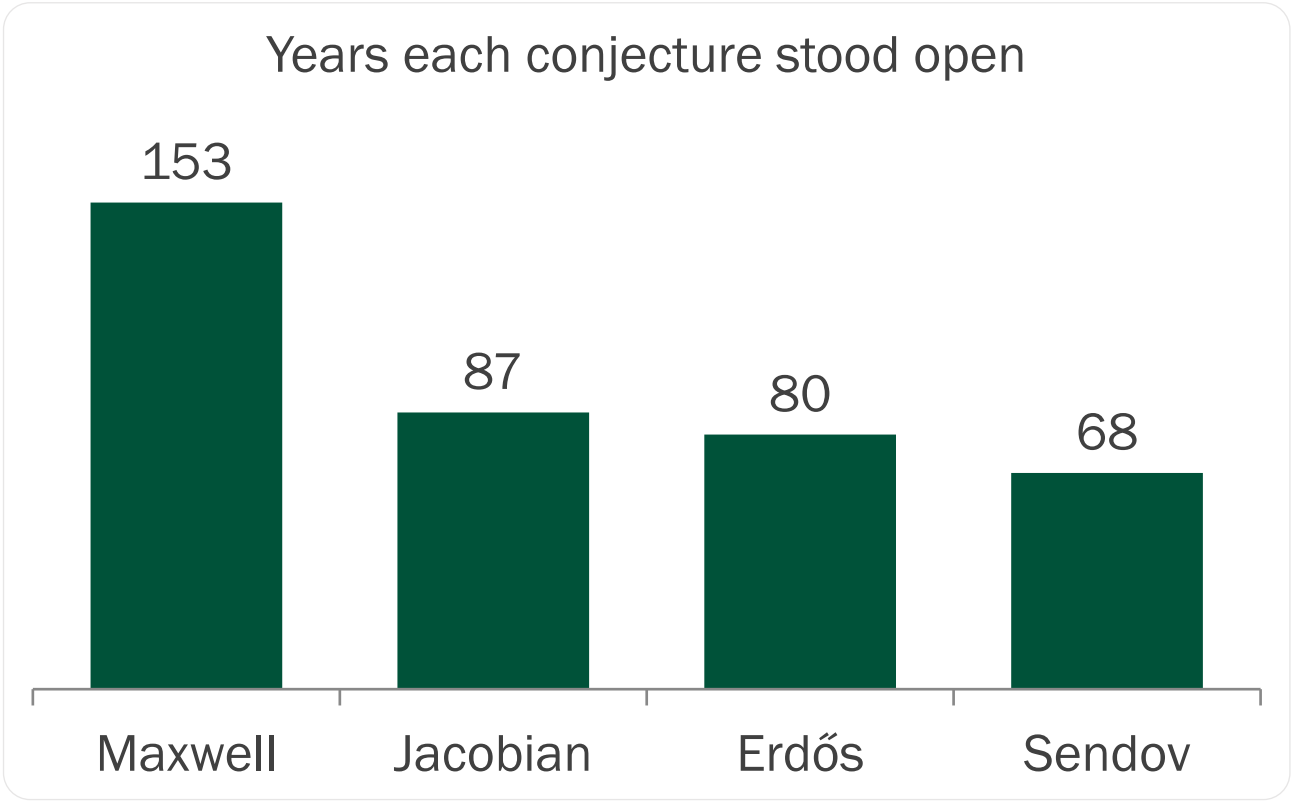
90% use AI coding agents at work at least weekly
68% use them every day

Sources: Sonar, State of Code Developer Survey 2026. BairesDev Dev Barometer, Q3 2025 and Q3 2026. SemiAnalysis 2026.

Capability. The task length a model completes has doubled about every 7 months since 2019.

Glut. 623 million changes: duplicated blocks up 81%, refactoring down from 13 to 3.8%.

From Code to Math (The Cost May Surprise You)



Hit rate. 9/353 open Erdős (2.5%)

Cheap. Ten results for about $2K of compute (company report).

Costly. Navier–Stokes: 10,000 agents, 88 hours, 130 billion tokens, a 166-page proof. Cost estimated in the millions.

Unclear: OpenAI's math proof release of 722 manuscripts (subsequently adjusted to 719 after a few withdrawals) covering 372 result families across 17 different mathematical fields, generated by an *unreleased internal reasoning model*, costing anywhere from a few **$K to $88K**.

OpenAI, Aug – Oct 2026 · Tsoukalas et al., arXiv 2026 · Mathlib statistics, 2026 · Tao, 2026 · Capital & Compute 2026

From Code to Math to Co-/scientists: 18 months

Mar. 2025

Sakana AI

AI-written paper passes workshop peer review

2026

Google

Co-Scientist published in Nature

Sep. 6, 2026

OpenAI

Reports an “automated research intern”

Sep. 23, 2026

Anthropic

950 agents, 21 hours, about 200,000 enzymes screened

Gottweis et al., Nature, 2026 | OpenAI, Sep. 6, 2026 | Anthropic, Sep. 23, 2026

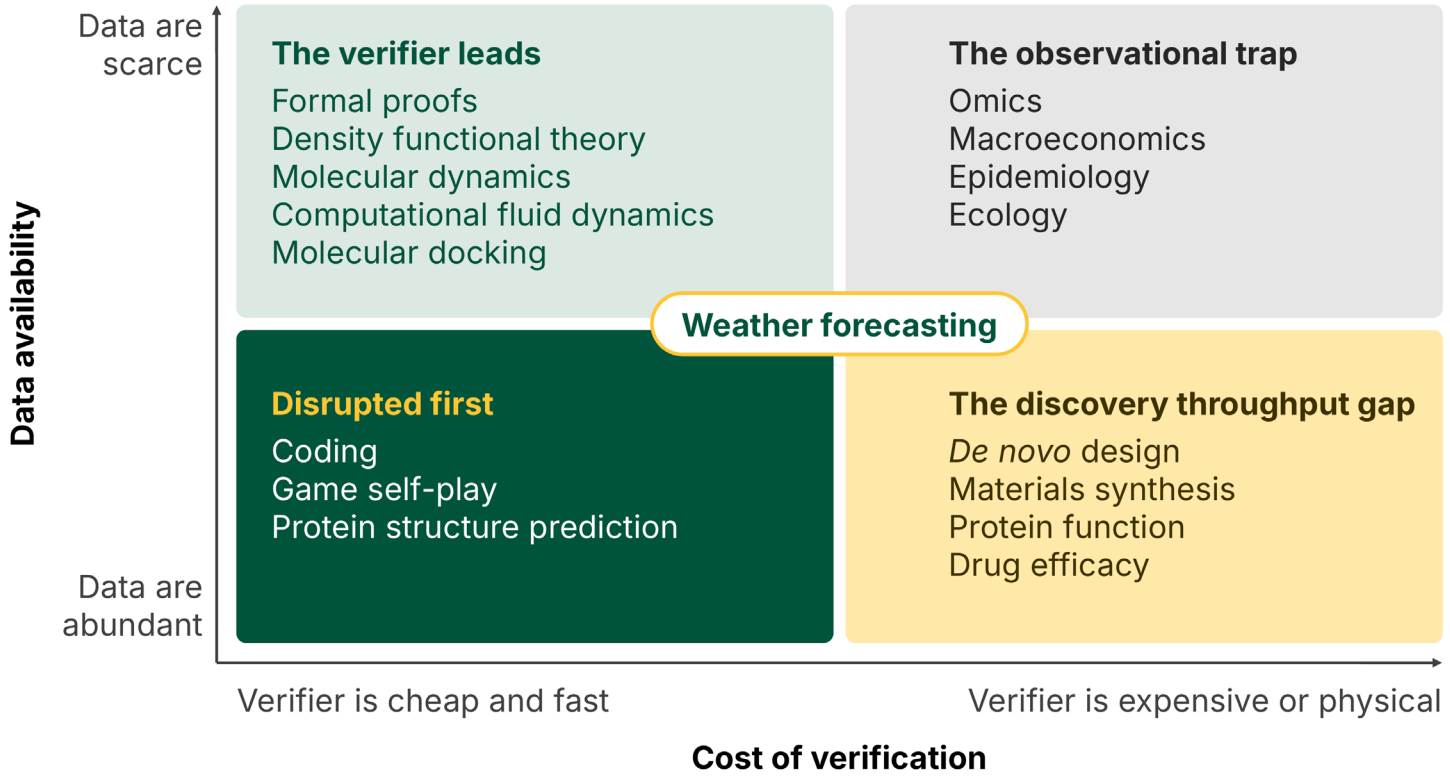
The Capabilities are Real, though Uneven they May Be

What Fields go first?
What remains for Humans?
What is the role of the University?



Generated with Gemini, prompt “painting like, threatening image of a lightning strike.” on Oct 21, 3:46pm, 2026.

A Scientific Perspective: Verifier and Data



Code. Abundant data, a cheap verifier. Disrupted first.

Mathematics. A cheap verifier in Lean, scarce data. The verifier explains this summer.

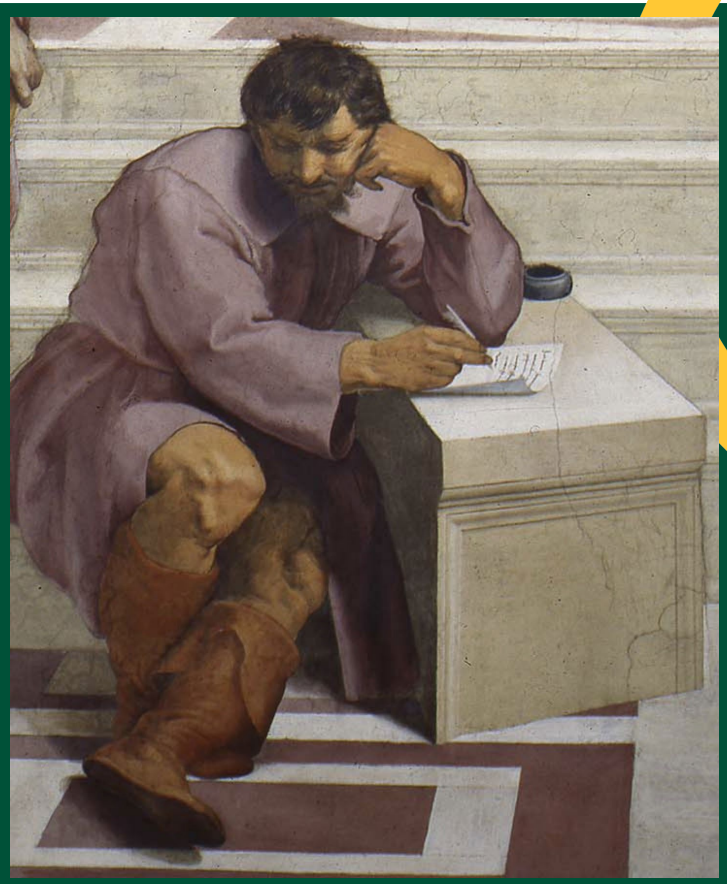
Biology. Little good data, and expensive verifiers that live in the physical world.

Rule of thumb: anything limited by physics is data poor & verifier expensive.

Pick your field. Most likely you lack a verifier. If you have one, it is expensive. If it is not expensive, you lack data. If you have both, watch the agents swarm.

The real world remains difficult.

Part II. What the agents are changing



Raphael, The School of Athens.. Heraclitus (face of Michelangelo), sits with his head resting on his hand and writing on a sheet of paper.

State of Employment, Education, Research, and the University in 2026

Employers

1 in 3

of entry-level jobs require AI skills, nearly triple since Fall 2025

National Association of Colleges and Employers (NACE). *Job Outlook 2026: Spring Update*. April 2026. Employer survey fielded Feb. 12 to Mar. 17, 2026.

Students

87%

of US college students use AI in their coursework (13% say they never do)

Lumina Foundation and Gallup. 2026 State of Higher Education study (n = 3,798 enrolled students, fielded Oct. 2025)

Research

3×

the papers from scientists who use AI, as topics studied shrank in diversity by 4.6%

Hao, Q., Xu, F., Li, Y., and Evans, J. "Artificial intelligence tools expand scientists' impact but contract science's focus." *Nature* 649, 1237–1243 (2026).

Universities

63%

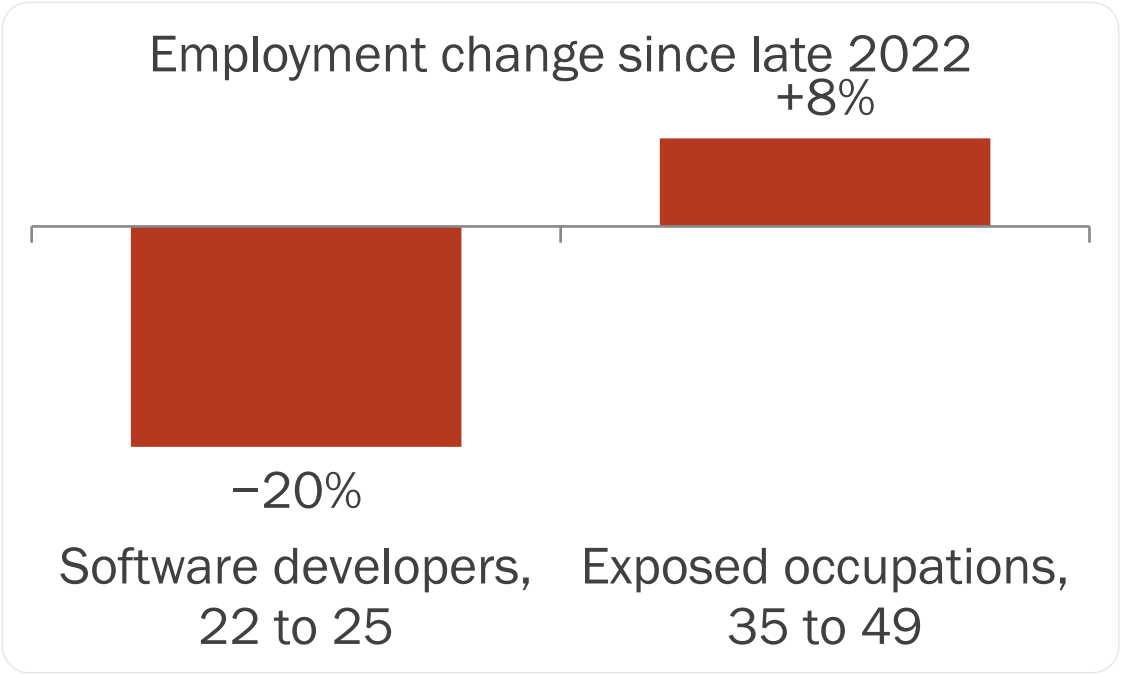
of faculty say 2025 graduates were not prepared to use AI at work

American Association of Colleges and Universities (AAC&U) and Elon University Imagining the Digital Future Center. National survey of college faculty on generative AI. Jan. 21, 2026 (n = 1,057 faculty, fielded Oct. 29 to Nov. 26, 2025).

From Students to Workforce

−16%

relative employment decline for ages 22 to 25 in the occupations most exposed to AI



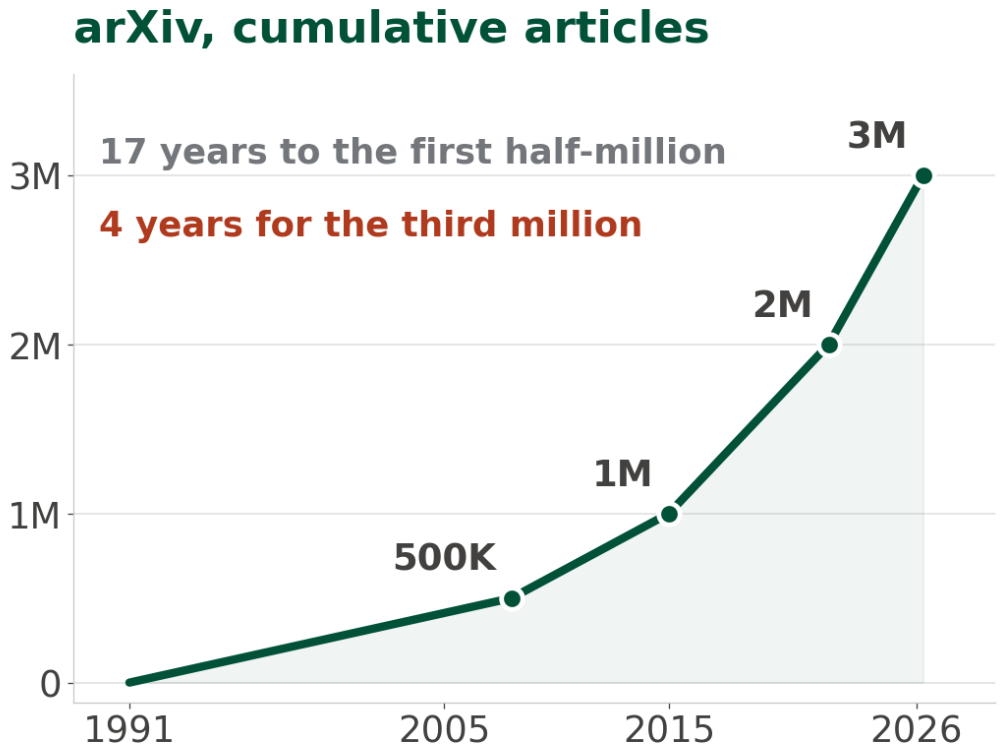
Brynjolfsson, Chandar and Chen, 2025 (payroll records) · New York Fed · Economic Innovation Group

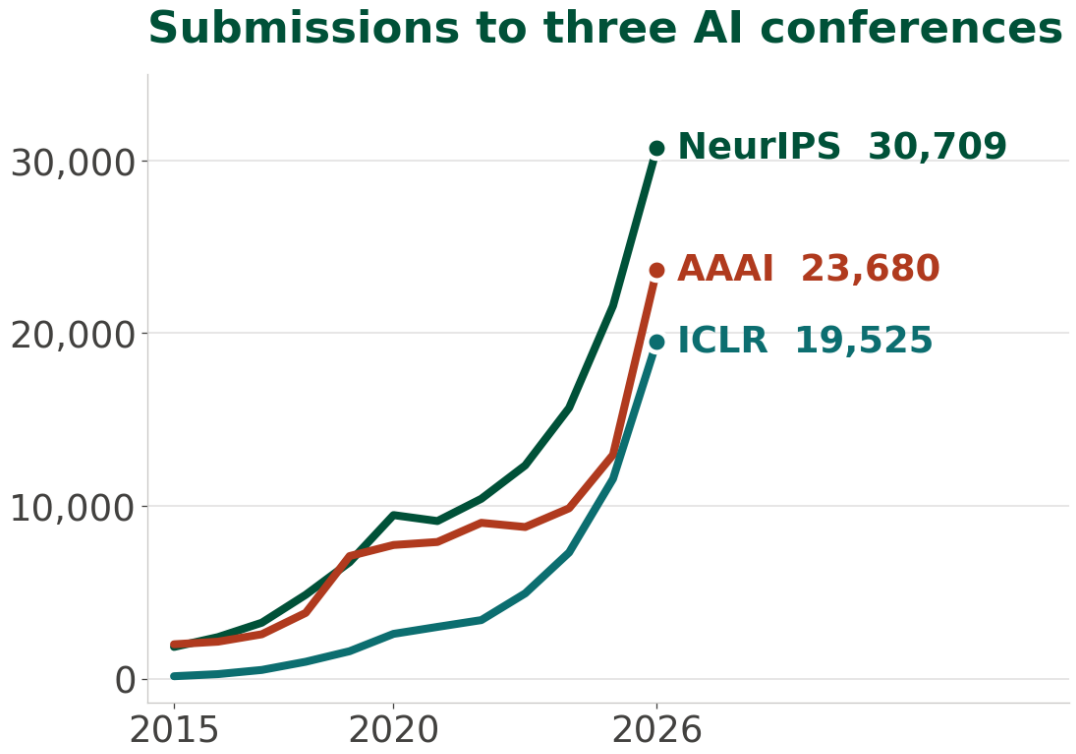
Entrants. Ages 22 to 25 in the most exposed occupations: a 16% relative decline.

Experience. Ages 35-49 in the same occupations grew more than 8%.

Caution. Viral 6.1% unemployment figure for computer science carries a confidence interval spanning 4-11%.

Research: papers and reviewers





The archive. 17 years to the first 0.5M papers; 4 years for the 3rd million.

Review. AAAI: 23,680 submissions against 28,000 recruited reviewers

200 papers and 14 books from one author in 9 months (Washington Post, 2026)

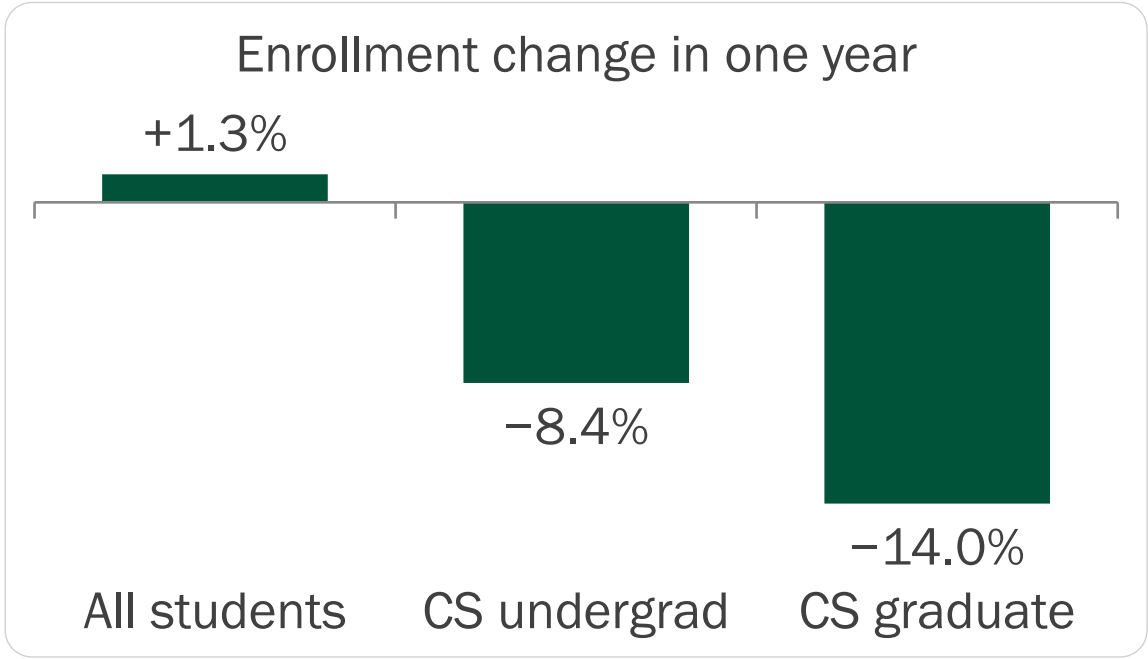
Student Enrollment

−8.4%

computer science undergraduate enrollment, as all enrollment grew 1.3%

−14.0%

computer science graduate enrollment, Fall 2025



National Student Clearinghouse, 2026 · HEPI Report 199

AI has left Computer Science

51%

of postings requiring AI skills sat outside IT and computer science

Lightcast, July 2025, on 2024 postings

13.3%

of entry-level postings name AI skills, nearly tripled in six months

National Association of Colleges and Employers (NACE) Job Outlook, April 2026

28%

higher salaries for postings that mention AI skills, roughly $18K/yr

Lightcast, July 2025, on 2024 postings

ANNUAL GROWTH IN AI-SKILL POSTINGS

- Human resources 66%
- Marketing and public relations 50%
- Finance 40%

What do Humans do Now? What is left for Us?

“Look at a child on a birthday, pushing past the gifts to play with the cardboard.”

Data gatherer

Humans as the most scalable source of training signal: faces, hands, gait, the unguarded hours.

7M pairs of camera glasses sold in 2025.

NVIDIA GEAR Lab, February 2026. Meta, 2025 sales.

Verifier

"Verification is now what humans do."

The machine generates. The human checks.

Both (job) categories are subservient to the machines

Part III. What humans are & What humans do



Raphael, The School of Athens.. Plato (left) points up, holding the Timaeus, and Aristotle (right) points to the ground, holding the Ethics.

“All men by nature desire to know” (Aristotle, Metaphysics I.1, 980a21, Ross).

Aristotle, Metaphysics, 350 BC

The sign of the desire is the delight we take in our senses for their own sake.

It is owing to their **wonder** that men both now begin and at first began to philosophize.

A man who is puzzled and **wonders** thinks himself ignorant. So, he **inquires.**

Metaphysics I.1, 980a21; I.2, 982b12 and 982b17; 983a12 to 20. Trans. W. D. Ross.



Gemini 2025, “Child building with cardboard.”

The machines do not tire. They also desire nothing.
They chase facts loose of wonder.
What humans are: wonder & What humans do: inquire

An Untaught Boy from Meno's Household

Confident

Socrates asks the boy to double a square. Twice the boy answers with **confidence, and wrong**.

Numb

By questions only, Socrates shows that the answers fail. The boy goes numb. Before, he thought he knew. Now he knows that he does not and **wants to**.

His own

Socrates withholds the answer. The boy pieces it together himself. Socrates insists that the knowledge is now the boy's **own**.



Raphael, The School of Athens. 1509–1511, fresco. Vatican Museums, Vatican City.

Plato, Meno 80a to 86c. Trans. W. R. M. Lamb, Loeb Classical Library.

A Question from my Undergraduate Midterm, for You
Can you be Confident AND Wrong?

ABCD is to ABCE

as

PPQQRRSS is to ?

Reasoning probe in UNIV 182, AI for All, Shehu, Fall 25 – Spring 26.

Call out your answer. Notice what you did to get there.

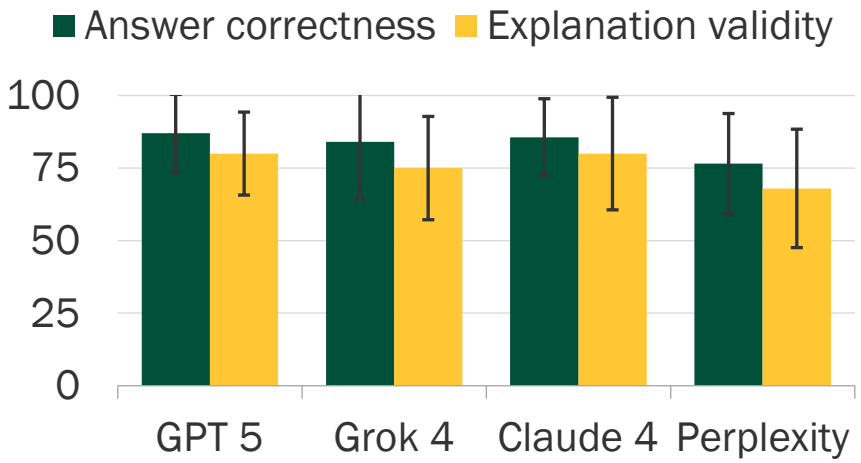


Fall 2025, AI for All (UNIV 182) Final Project – New Mason Core course (general education) open to all students

From my own undergraduate students in AI4All (UNIV 182)
The midterm: three weeks, ten prompts, four chatbots

1 Design	2 Compare	3 Score	4 Reconcile
Author 10 prompts across 6 reasoning families	Submit identical wording to 4 chatbots	Rate the answer and the explanation separately	Resolve scoring and report evidence

The question, investigation, and findings led from numbness to ownership



For each, mean explanation validity fell below mean answer correctness, by **5.6–9.0** points.

"Good pattern followers, not reliable general thinkers."

"Users cannot trust confidence or nice wording as proof the reasoning is correct."

"If we had not checked, we would have trusted it." Student teams, UNIV 182

Shehu et al., "AI Literacy as Experimental Practice: Students as Investigators," *Communications of the ACM 69 (9): 48-56,* 2026 (with all students as co-authors)

So, All Humans Wonder
All Humans Want to Know

How do they learn to know when the agents deliver and not withhold?

Part IV.
How Learning Happens:
From Aporia to Periagōgē



Raphael, The School of Athens. Pythagoras, with the turbaned Averroes leaning over his shoulder, and a young man body turned.

However we Measure, Student AI Use is Norm

87%

of U.S. college students use AI in their coursework

Lumina-Gallup, 2026

85%

of U.S. college students used AI for coursework in the past year

Inside Higher Ed, 2025

62%

of U.S. students aged 12 to 29 use AI for homework

RAND, 2026

57%

of U.S. college students use AI for coursework at least weekly

Lumina-Gallup, 2026

32%

of U.S. college students use generative AI daily

Tyton Partners, 2026

Lumina Foundation and Gallup, 2026 (n = 3,798) | Inside Higher Ed and Generation Lab, 2025 (n = 1,047) | RAND, Mar. 17, 2026 (n = 1,214) | Tyton Partners, Time for Class 2026

Homework is Now Detached from Formation

94%

of undergraduate students use generation on assessed work

12%

submit it outright

Homework was always a proxy for understanding and formation.

It is now detached from its purpose.

Rethink the proxy

HEPI, Student Generative AI Survey 2026 (Report 199), UK undergraduates

The Box Can Be Checked Before the Numbness

With Socrates

He asks and withholds. The boy does the inference.

With Agents

They deliver the path, or portions, the moment you ask. Inference can be skipped.

Did you build your ownership?

Socrates says education is not putting knowledge into a soul that lacks it as if putting sight into blind eyes.

The capacity to learn is already in every soul. The wonder is there but has to be stoked.

The body needs to be turned toward the light, the way an eye cannot be turned without turning the body. The Greek word is periagōgē, a turning around, of the soul and body.

How do we turn the body among the agents?

Emerging Modes of Inquiry, Learning, and Working

1. The agents deliver the paths. Then you walk/verify/make sense of the paths (Tao's digestions of agentic proofs).

2. You hold the agents back, slow them down, stop them at key points, so that you have time to do the inference yourself.

What do Students Want?

72%

declined generative AI on a writing exercise when given the choice

73%

articulated something teachers have that AI cannot supply

Asked what helps them learn, students pointed to smaller classes, hands-on tasks, and teachers who read their work and know them.

Oxford University Press, June 2026, about 4,000 students. Tyton Partners, 2025

Part V. Where Learning Happens



Raphael, The School of Athens.

Scholē = The Place that Holds Time

Aristotle, Metaphysics I.1

The Greek word for leisure is scholē. Albanian, shkollë. It is where "school" comes from.

The free kind of knowing requires time that is not entirely driven by necessity. That is the 2,000-year-old description of the university.

Plato, Republic VII, 518b to d

Education is not putting sight into blind eyes. The capacity to learn is already in every soul.

It has to be turned toward the light, the way an eye cannot be turned without turning the body. Periagōgē. A turning takes time and a place.

Metaphysics I.1, 981b20 to 25. Republic VI.509d to 511e; VII.514a to 518d. Trans. Shorey, Loeb.

The question for a university: are we educating people to verify what is put before them and/or to turn toward what they do not yet see?

Turning: An Incomplete Answer from George Mason University



M.S. in Artificial Intelligence (launched in Fall 2025)

Graduate Certificates in Responsible AI, AI x Health, and more



Undergraduate Minor in Ethics and AI (launched in Fall 2024)

Mason Core AI for All (UNIV 182 – launched in Fall 2025)



Patriot AI Gateway Platform (launched Spring 2025)

Microsoft 365 CoPilot (launched Spring 2025) & Premium for innovators willing to build AI Foundry (API access to thousands of models) for researchers



Responsible AI Use Guidelines (published Spring 2025)

Reference Guide for AI Integration In Education for the Commonwealth

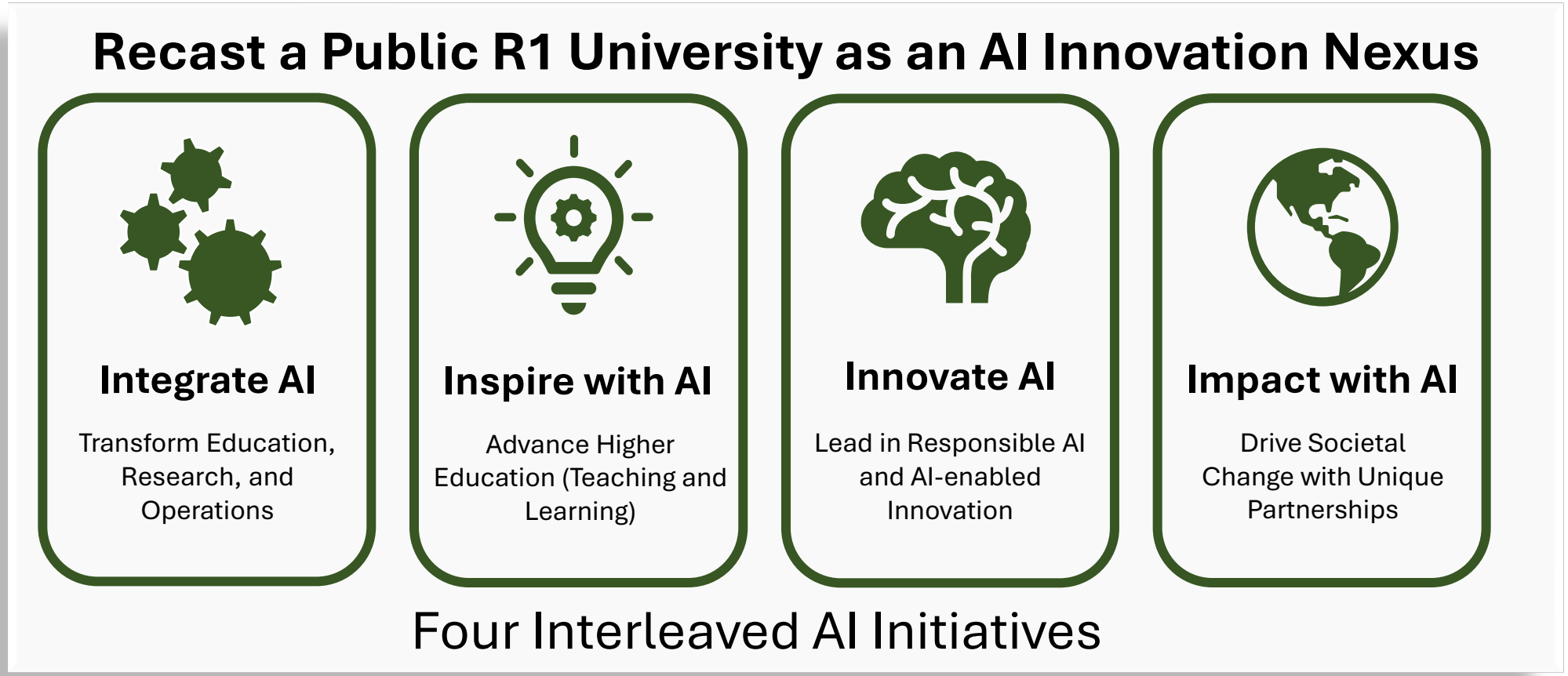


Humanities and AI Research Community

AI Communities of Practice (Students and Staff communities)

Opportunities for students to build skills as they help units integrate AI in operations

An Incomplete, Evolving Answer under a Principled Approach



What a Public R1 Access University must protect

Not ignorance. Not slowness for own sake

Not shutting down and not careless adoption, but thoughtful innovation/experimentation

The time for questions to become one's own

Texas State and George Mason

Public. Access-driven. Many students the first in their families on a campus.

When the mission is access, the margin for carelessness is thinner, and the obligation to think clearly is greater.

The work of the university now: Time to hold out the answer and yet Urgency to prepare for the new mode of work: it will look different across disciplines and programs, for a freshman and for a junior, for an undergraduate and for a graduate student.

Scholē That Turns the Body: Five Requirements

1	**PROTECT** the time in which a question becomes one's own	*aporia*
2	**INSPIRE, GUIDE, TURN, MENTOR, SEE, CONNECT**	*periagōgē*
3	**FORM** people who aim and not just follow	*about and for people*
4	**SEEK** hard land, wonder, inquiry with people AND agents	*messy problems*
5	**BUILD** in public so knowledge disseminates and wonder spreads	*public mission*

Thank you

Where not referenced, based on public writing @ https://amardashehu.substack.com