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AI and the future of the (South African) university

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Learning and Teaching Enhancement Seminar
Stellenbosch University · 15 October 2026



February 2024: four threats to the university

Finance

State funding falls while administration grows. In the US, admin jobs rose **452%** since 1976; faculty 92%.

Politics

Rigid labour law and hiring rules. 'Just try to appoint a brilliant foreign scholar at a South African university today.'

Ideology

Fashionable theory with little evidence that it works and little demand from employers.

Technology

AI tutors, administrators and research assistants – 'with the fortunate coincidence that it will improve exponentially'.

Fourie, 'The four horsemen of the university', *Our Long Walk*, 12 February 2024.

My boldest forecast: the superproductive professor



Within a year or two, we will see the rise of a new class of superproductive professors producing 100 or more papers a year, all with the help of AI.

Fourie, February 2024

- ▶ And the twist: 'AI is also the **solution** to the Four Horsemen.'
- ▶ Two and a half years later, how did I do?

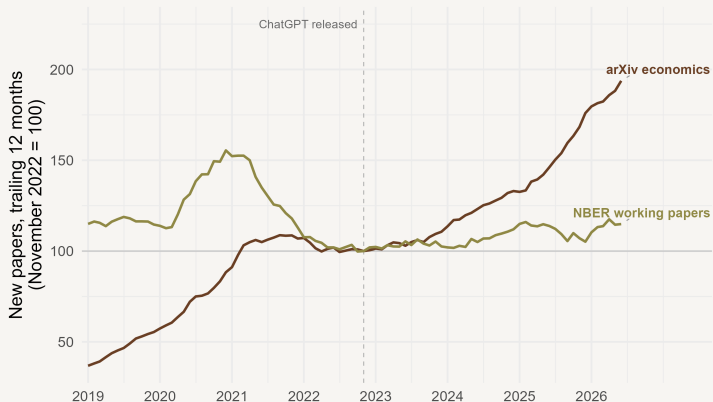
Higher Education

Using AI, a professor wrote 200 papers this year. Researchers are alarmed.

An online platform removed 257 papers written or co-written by the University of Chicago's Nicholas Polson after other academics raised questions.

September 23, 2026

Half right: economics preprints have doubled



Source: arXiv and NBER • Visualised: ourlongwalk.com

- ▶ arXiv economics: **almost double**
- ▶ NBER, where posting is gated: about +15%

What I missed

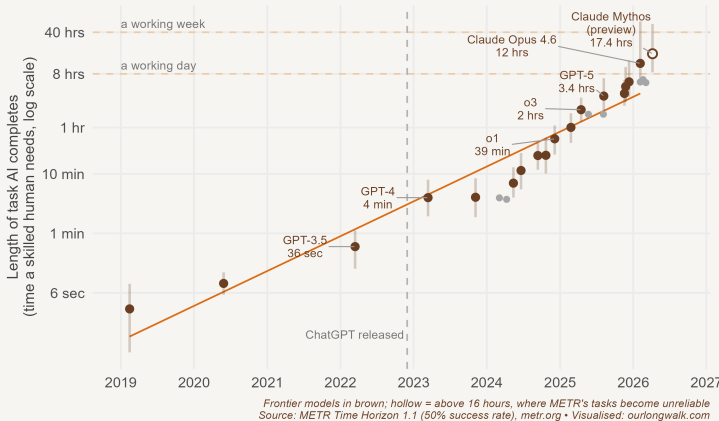
The question was never *how many* papers, but **what stays scarce** once papers are cheap.



PART I

What the machines can now do

AI can now do day-long tasks on its own



- ▶ 2023: tasks that take a skilled human **4 minutes**
- ▶ 2026: tasks that take **a working day** or more
- ▶ Doubling time: about **6 months**, faster since 2024

Software engineering was automated first.

AI now does much of the research behind the next AI

Code

80%+

of approved code at Anthropic is written by AI – up from low single digits in January 2025

Research

26%

of AI research work is done autonomously, under high-level human supervision – up from 1% in March 2026

Peer review

1

paper – idea, experiments and text – by an automated pipeline passed peer review at a top machine-learning workshop

Chan, Hinton, Bengio and others (2026), 'What if automating AI R&D triggers an intelligence explosion?', Cambridge Programme on AI Science & Policy, Working Paper 2/2026.

Could it become an intelligence explosion?

The feedback loop

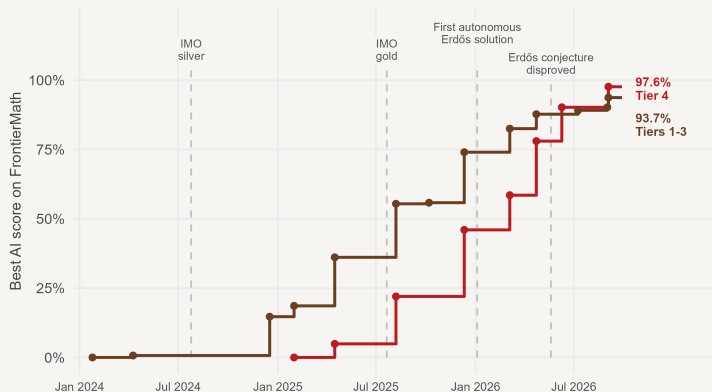
- ▶ AI researchers build better AI researchers, which build better ones still
- ▶ At full automation, the AI research workforce could grow **100-fold** in months or years
- ▶ The US researcher population took **seven decades** to do that

The constraints

- ▶ Diminishing returns, compute, data, slow experiments
- ▶ Fastest where feedback is **fast and checkable**: code and mathematics
- ▶ Slower where results need physical experiments or new data: the laboratory, the archive, the classroom

Their central estimate: within 1.5 years of full automation, a year of today's AI progress could take five weeks. The uncertainty is large – but among the authors are Geoffrey Hinton and Yoshua Bengio.

Mathematics is the leading indicator



Best score to date on Epoch AI's FrontierMath (version 2, all models re-run June 2026)
Source: Epoch AI; IMO; erdosproblems.com; Alon et al. (2026) • Visualised: ourlongwalk.com

- ▶ FrontierMath: research problems set by mathematicians
- ▶ Hardest tier: from **0%** to **98%** in 20 months
- ▶ May 2026: an AI **disproves** Erdős's 1946 unit-distance conjecture
- ▶ Not done yet: 3% on Epoch's new set of open Erdős problems

6 October 2026: OpenAI releases 722 maths papers

One day
722

papers written by OpenAI's
agents – many on hard,
long-standing problems

Not on the front page of any daily
newspaper. Not even on the inside.

Gans, 'OpenAI drops a bomb on maths', *Joshua Gans' Newsletter*, 7 October 2026.



*It isn't an overstatement to say that this is
probably the biggest day of scientific
advancement in history.*

Joshua Gans, 7 October 2026

Gans's division of labour

Before: humans set the conjectures.

Middle: the machine proves them.

After: Lean and mathematicians verify.

What the mathematicians say



If a human had written the paper and submitted it to the Annals of Mathematics . . . I would have recommended acceptance without any hesitation.

Tim Gowers, May 2026, on the AI disproof



What is the purpose of our profession? If we don't ask these questions ourselves, then they will get answered for us by a technology company or decided by financial incentives.

Terence Tao, in *Nature*, May 2026



Mathematicians did not ask for this work to be done.

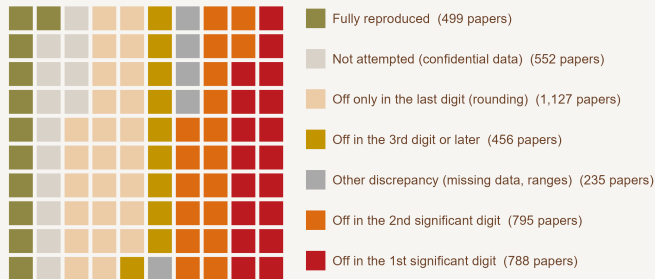
Association for Human Mathematics, 7 October 2026, on OpenAI's release



Math 2.0 will require both expanding the research frontier, while simultaneously decentering the traditional role of problem solving.

Terence Tao, October 2026

Economics next: an AI re-ran 4,452 top-five papers



One square = 1% of 4,452 papers in AER, Econometrica, JPE, QJE, REStud
Source: Schwartz, Andrews & Shapiro (2026), NBER WP 35782 • Visualised: ourlongwalk.com

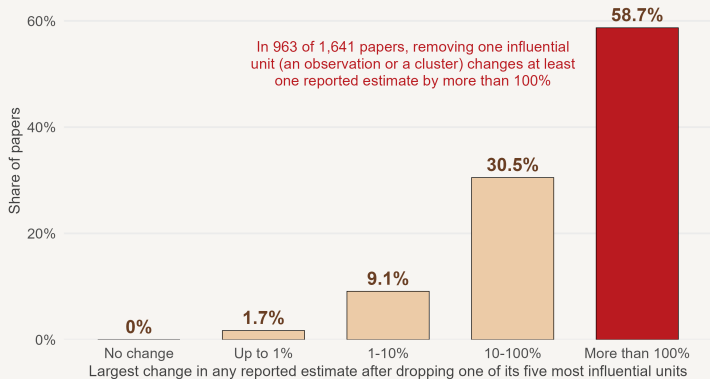
Every top-five replication package since 2000. Only **one in nine** reproduced exactly.

One in three

Many gaps are only rounding. But in one paper in three, a number is off in its **first or second digit.**

Schwartz, Andrews and Shapiro (2026), NBER Working Paper 35782.

Many published estimates are fragile



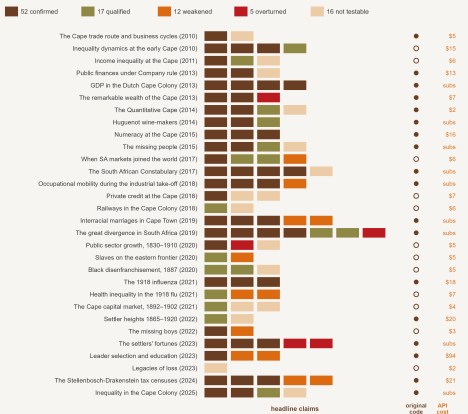
Source: Schwartz, Andrews & Shapiro (2026), NBER WP 35782 • Visualised: ourlongwalk.com

- ▶ Drop **one** influential observation or cluster: in 59% of papers, some reported estimate changes by over 100%
- ▶ Caveat: percentage changes are large when an estimate is near zero

The benchmark

For AI, it is not perfection. **It is human work.**

So I asked two AIs to replicate 30 of my own papers



Filled circle: some original code survived, 'subs' run on a subscription, no API fees.
Source: Refourie (github.com/johanfourie/refourie)

- ▶ Claude and Codex; **102** headline claims; 29 hours, \$269
- ▶ 52 confirmed, 17 qualified, 12 weakened, **5 overturned**
- ▶ Mundane errors: swapped columns, 43 t-statistics with the wrong sign

Who made the errors

The verdicts are the machines'. **The errors are mine.**

Fourie, 'Table turners', *Our Long Walk* (2026); github.com/johanfourie/refourie.



PART II

The end of writing

We will soon stop writing our own papers.

Coding was automated first

A skill we valued. In the AI labs, machines now write **80%** of it.

Prose is next

Academic writing is codifiable. For many of us the machine already writes a clearer paper.

The real question

Not *whether* we delegate the writing, but **which tasks remain with the researcher.**

Writing is not necessarily thinking: five economic lenses

1. Search

More drafts tested: **5 become 20**. Biggest gain for second-language writers.

2. Skills

Today's text vs **next year's judgement**. A tool can raise one, lower the other.

3. Anchor

The machine's first draft becomes the **default** we judge others against.

4. Signal

Cheap fluency tells readers **less** about quality.

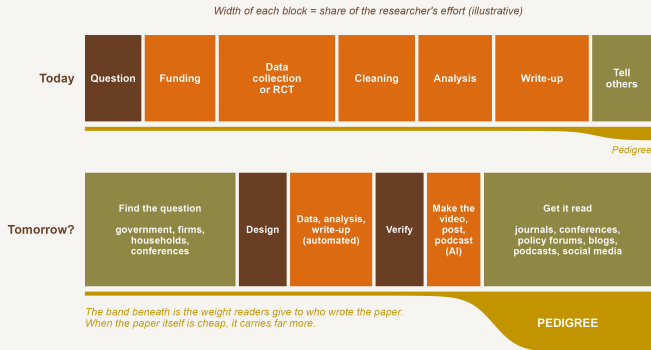
5. The field

More papers, **fewer** distinct ideas. A conjecture.

'The tool has quadrupled the number of arguments she can afford to test. It has checked none of them.'

Fourie (2026), 'Writing is not thinking', resubmitted to *Kyklos*.

When papers are cheap, pedigree decides who is read



Source: Author's illustration, extending Joshua Gans's bookend slide (2026) • Visualised: ourlongwalk.com

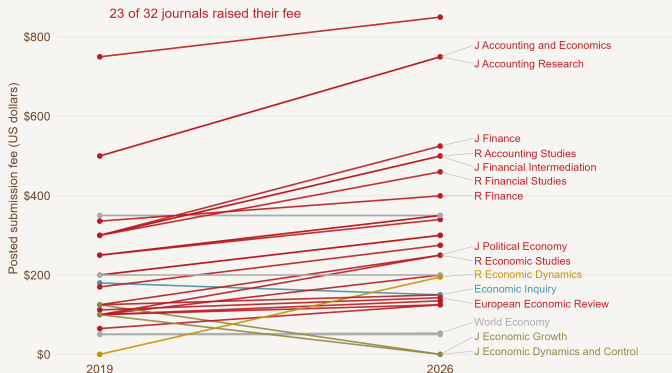
- ▶ Once LLMs wrote freelancers' applications, the best were hired **19% less**
- ▶ Readers fall back on the name and the institution

The South African risk

AI brings a young scholar in Polokwane close to a Harvard professor's output – **not** to her audience.

Fourie, 'On pedigree', *Our Long Walk* (2026); Galdin and Silbert (2025), 'Making talk cheap'.

Journals now ration peer review by price



Source: Fourie (2026), 'The price of submission' • Visualised: ourlongwalk.com

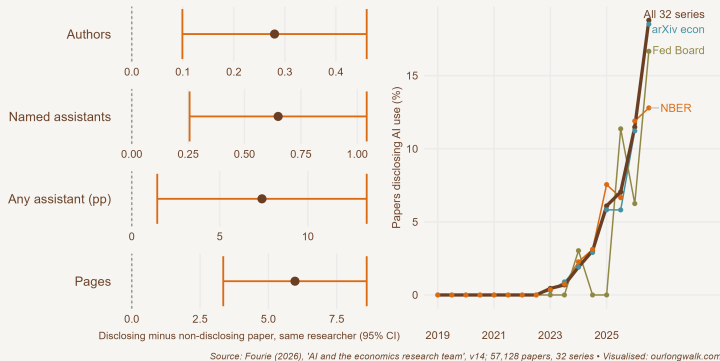
- ▶ Since 2019, **23** economics journals raised their fee
- ▶ Journals ration referees with **time** and **money**: 68% of the top 50 charge to submit

Who pays?

SA universities need a sustainable way to fund fees. Forecast: **\$500+** at top journals soon – and paid referees.

Fourie (2026), 'The price of submission'. Posted fees, 2019 and 2026, for the 32 journals with comparable endpoints.

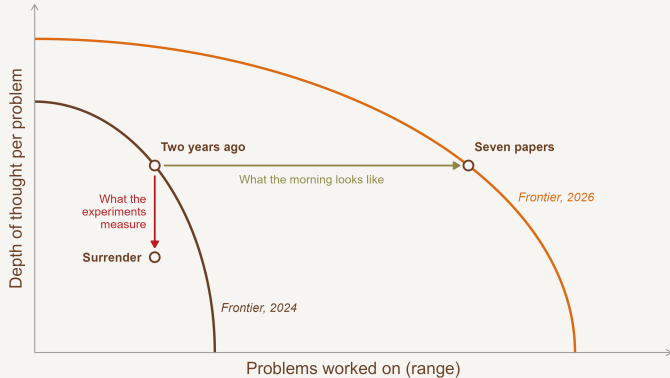
In economics, AI papers have more authors, not fewer



- ▶ Disclosed AI use: zero to **19%** of working papers since 2023
- ▶ Same researcher, AI paper: **+0.3** authors, **+6** pages
- ▶ Projects grow, so teams grow – for now

Fourie (2026), 'AI and the economics research team', v14: 57,128 working papers from 32 series, to September 2026.

Broader research, or more homogeneous research?



Source: author's schema • Visualised: ourlongwalk.com

- ▶ The worry: we think less deeply about each problem
- ▶ The opportunity: we work on **many more** problems, across fields
- ▶ The risk: in the natural sciences, AI users publish $3\times$ more papers, on a narrower range of topics

Fourie, 'Master of none', *Our Long Walk* (2026); Hao, Xu, Li and Evans (2026), 'Artificial intelligence tools expand scientists' impact but contract science's focus', *Nature*.

PART III

What is a university for?

Universities became places for training



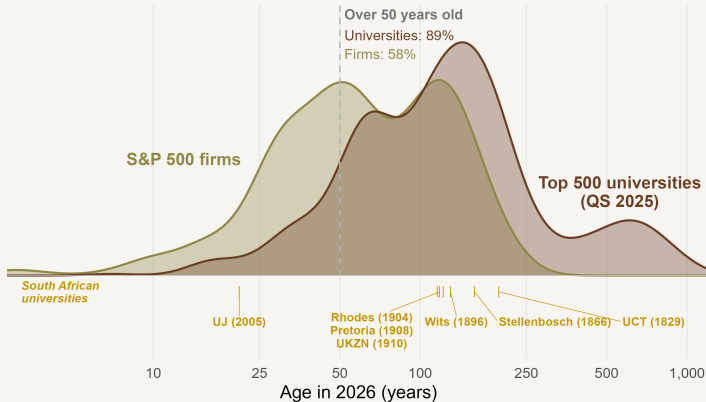
Aristophanes, *The Clouds*, 423 BC

- ▶ A debt-ridden farmer wants his son taught to argue his way out of paying
- ▶ We built the *prakterion*, the place for training – not the *frontisterion*, the place for thought
- ▶ A quarter of one global ranking: graduates in senior corporate jobs

AI weakens the degree in two ways

It does the measurable tasks, and it removes the entry-level jobs the degree was meant to secure. Hence students booing AI at their 2026 graduations.

Universities last longer than almost any other institution



Source: QS World University Rankings 2025; Wikidata; Wikipedia S&P 500 list • Visualised: ourlongwalk.com

- ▶ Median age: **122 years** for the world's top 500 universities; 59 for S&P 500 firms
- ▶ Only **6%** of S&P 500 firms are older than Stellenbosch
- ▶ The best-funded US universities are older still: 99% over 50

| They survive by changing what they bundle together



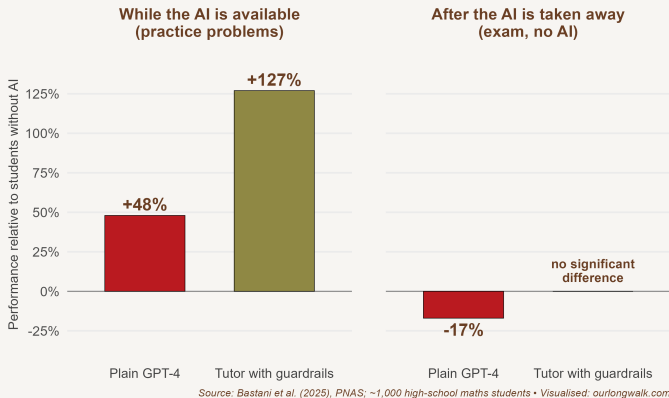
Why pay for the combination of products if one only wants a part?

Cutler and Glaeser (2026), NBER Working Paper 35079

The AI question

Lectures, feedback, essays and code are now nearly free. Which parts of the bundle are still **worth more together?**

Two outputs: homework today, judgement tomorrow



- ▶ Plain AI: better homework, **worse** learning
- ▶ A tutor that makes students try first: large gains, no loss

The test that matters

Can the student do it
without the tool?

What this means for how we teach

1. Own account first

Question, claim and evidence – before the machine drafts.

2. AI as critic

AI as critic and tutor, not as a source of answers.

3. Assess judgement

Orals, work in the room, transfer to new problems.

4. Teach checking

Every claim traced to a source, every number re-run.

5. Use the saved time

More problems, better questions.



PART IV

Who pays for judgement?



Mining wealth funded our universities

1848–1910: mining money

- ▶ Wits, on the Witwatersrand goldfields
- ▶ UCT, funded by mining money
- ▶ Stellenbosch: Jannie Marais's Kimberley diamonds

2026: the AI fortunes

- ▶ OpenAI Foundation: a stake worth about \$220bn
- ▶ Anthropic's founders pledge 80% of their wealth
- ▶ \$37–100bn a year in new giving: up to a sixth of all US philanthropy

The mines have closed. The universities remain.

Fourie, 'The new gold rush', *Our Long Walk* (2026); Harvey, *Past & Present*; Ransohoff (2026).

Endow chairs where talent is plentiful



219 universities in the top 1000 (bar the top 100) outside China and the rich world • QS 2026 • Visualised: ourlongwalk.com

- ▶ Industry pays top AI scientists **\$1.5m a year** more than universities do
- ▶ Pay competitive salaries, plus compute
- ▶ Nine in South Africa

The proposal

\$50m institutes at 219 universities in developing countries: **\$11bn.**

Carnegie did it once: free libraries raised invention



Source: Berkes & Nencka (2026), *Review of Economics and Statistics* • Visualised: ourlongwalk.com

- ▶ 2,500 libraries, 1883–1919 – one at Stellenbosch
- ▶ Library towns: patenting **+10–12%** over two decades, with more women inventors

Then and now

Endowed chairs could do for research today what the libraries did for invention.

The university's role: test the new tools first



- ▶ Anton van Niekerk: a university is the *voorloper*, who walks ahead of the ox-wagon to test whether the road will hold
- ▶ Two traits: **experimentation** – trying new methods before others do – and **agility** – changing practice quickly when the evidence says so

Our task

Use AI openly, in every course and every lab, and publish what we find.

Van Niekerk (2009), 'What is a university?', in *Let's Talk About Varsity*.

AI could help with all four threats

Finance

AI can do much of the administrative work that grew 452%. AI fortunes can endow chairs.

Politics

Where hiring rules bind, AI gives every lecturer a research assistant and every student a tutor.

Ideology

Replication is now cheap. Claims can be tested against the evidence, at scale.

Technology

The tools that threaten the old model are also the means to address the other three.

THE UNIVERSITY'S VALUE PROPOSITION

Experimentation and agility

Universities that do not adopt AI will fall behind those that do.