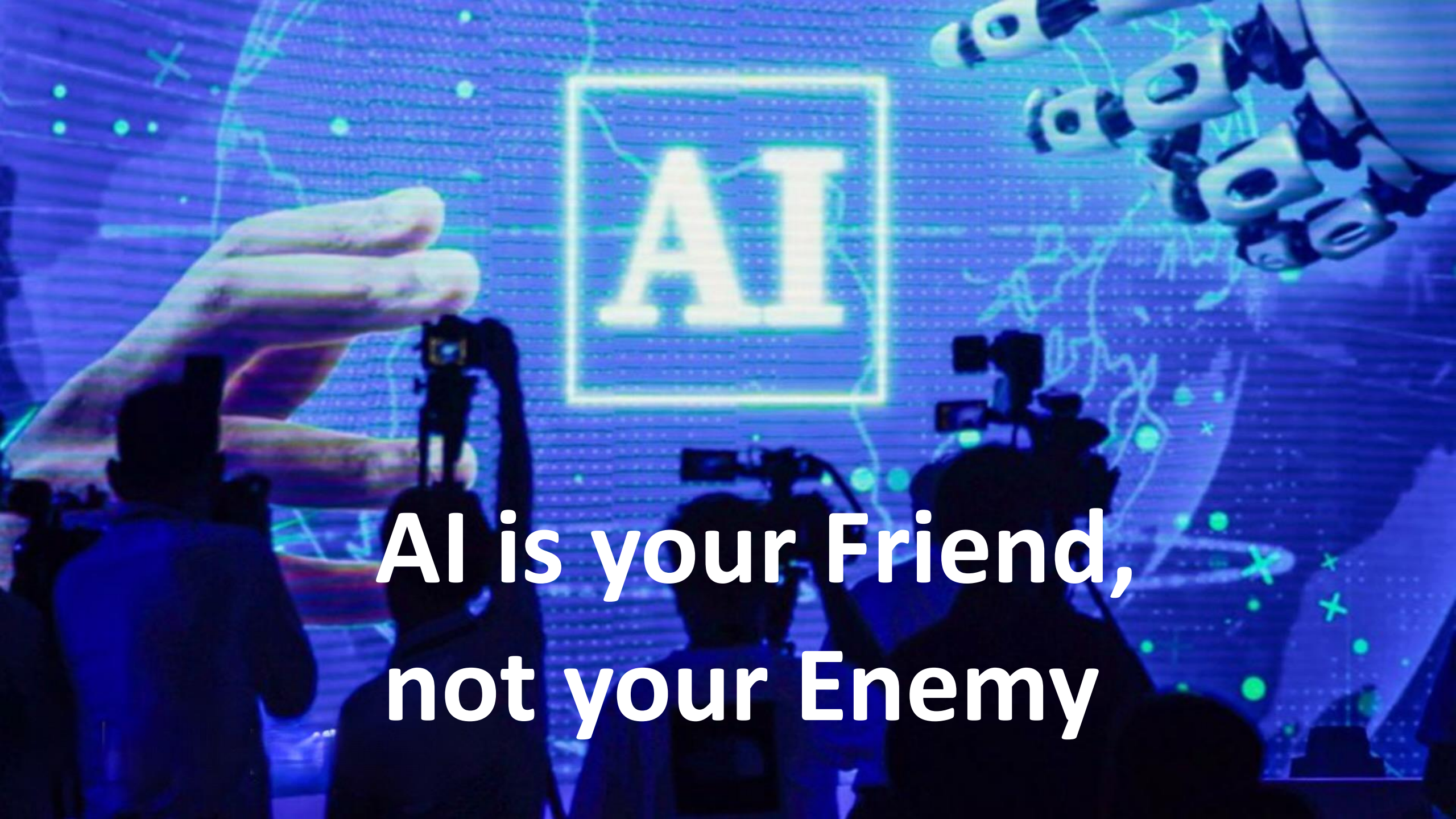

AI
AI is your Friend,
not your Enemy

1980

DARTMOUTH

VOX CLAMANTIS IN DESERTO

1769

1985 - 2005

EPIC GROUP PLC

2013-21

CogBooks

2006-21

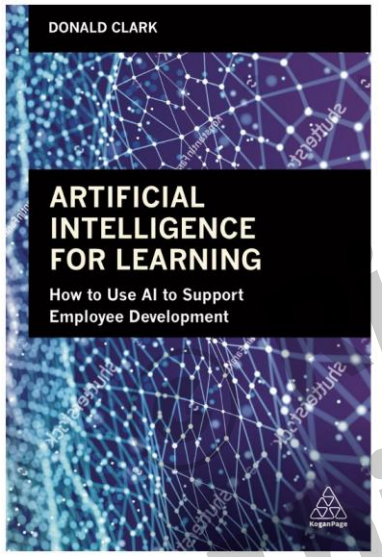
learningpool

2014-

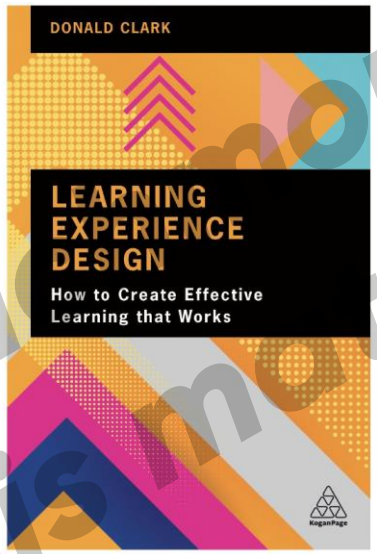
WildFire

World's first AI content creation service in minutes not months...

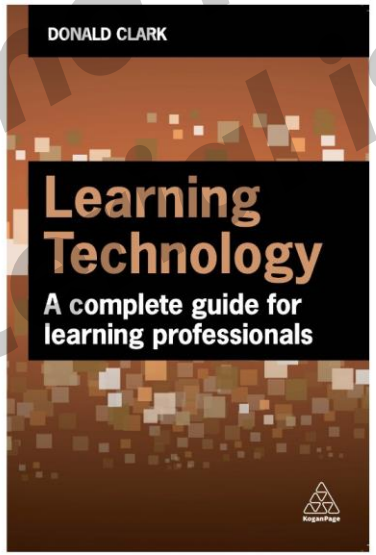
2021



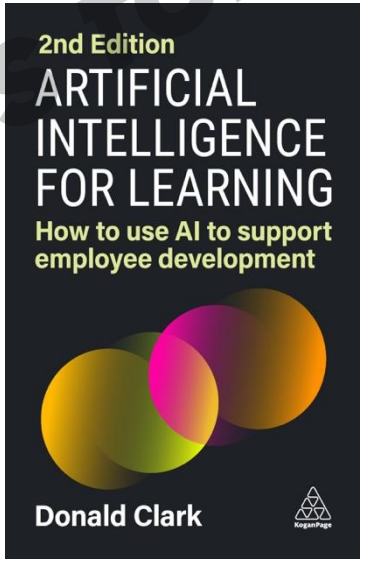
2022



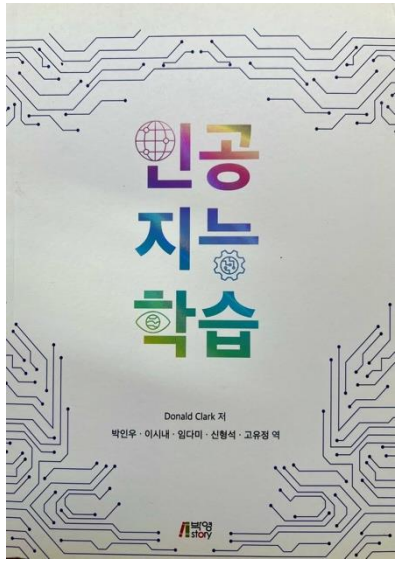
2023

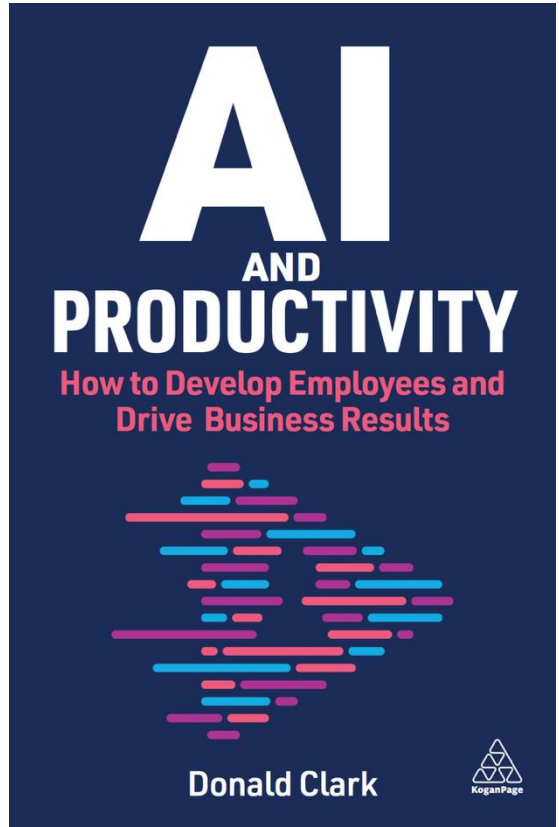


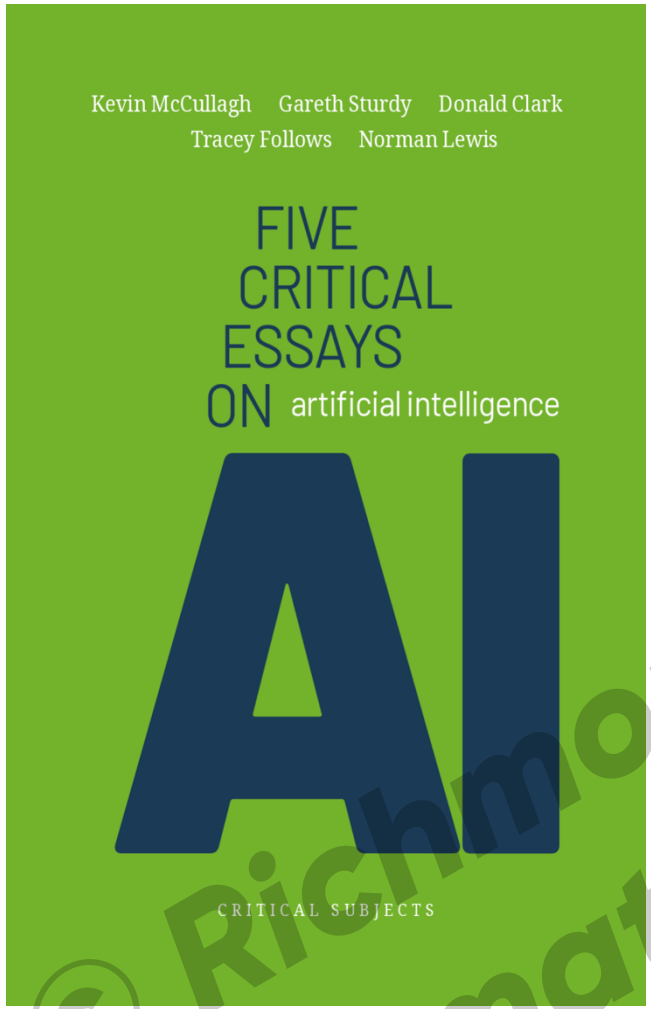
2024



2025







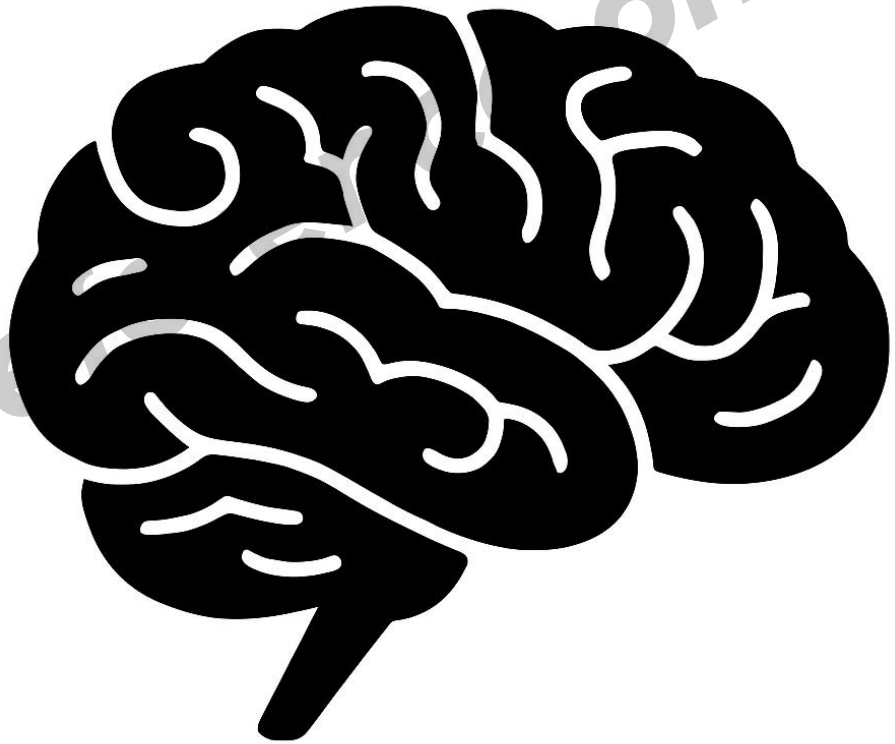
"The real problem of humanity… We have *Palaeolithic* minds, *Medieval* institutions and *Godlike* technology."

E O Wilson

https://futurecities.org.uk/wp-content/uploads/2025/10/FCE_on_AI_final.pdf

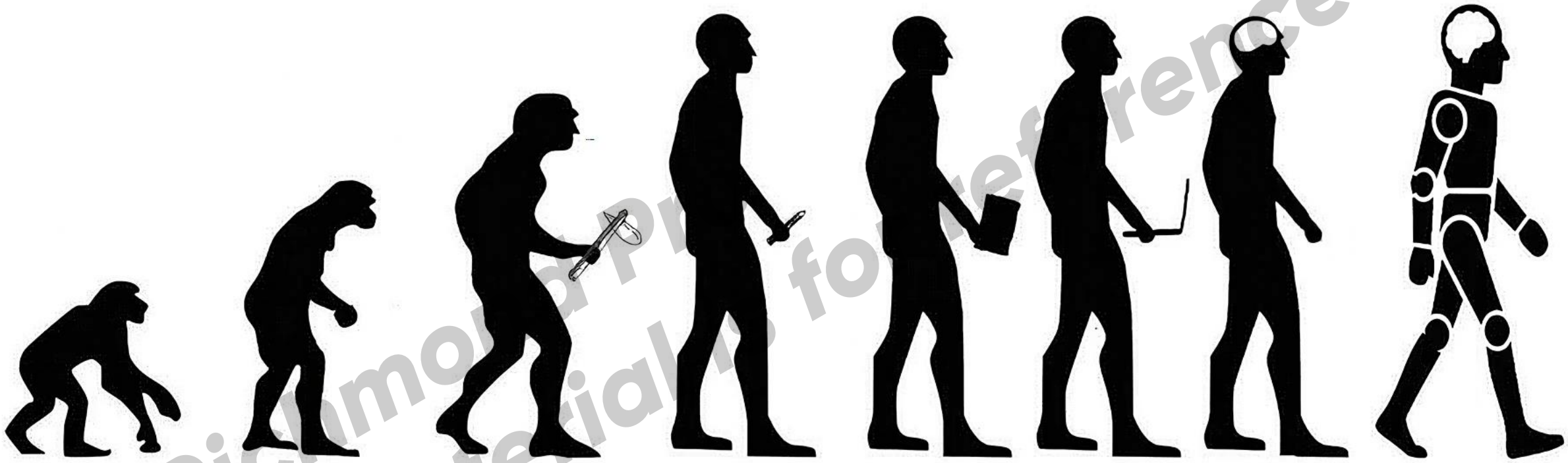
PALAEOLITHIC MINDS

- 20+ years to educate
- Forgets
- Poor memory
- Cognitive overload
- Cognitive biases
- Sleep 1/3 of our lives
- Can’t upload, network or scale
- Die!



AI = none of the above

GODLIKE TECHNOLOGY



Bipedal	Marks	Cave art	Writing	Printing	Computers	AI	Embodied?
5,000,000	500,000	50,000	5,000	500	50	5	AGI?
							ASI?

Reading 8 hours a day, how long would it take to read the text that trained the latest AI?

Reading 8 hours a day, how long would it take to read the text that trained the latest AI?

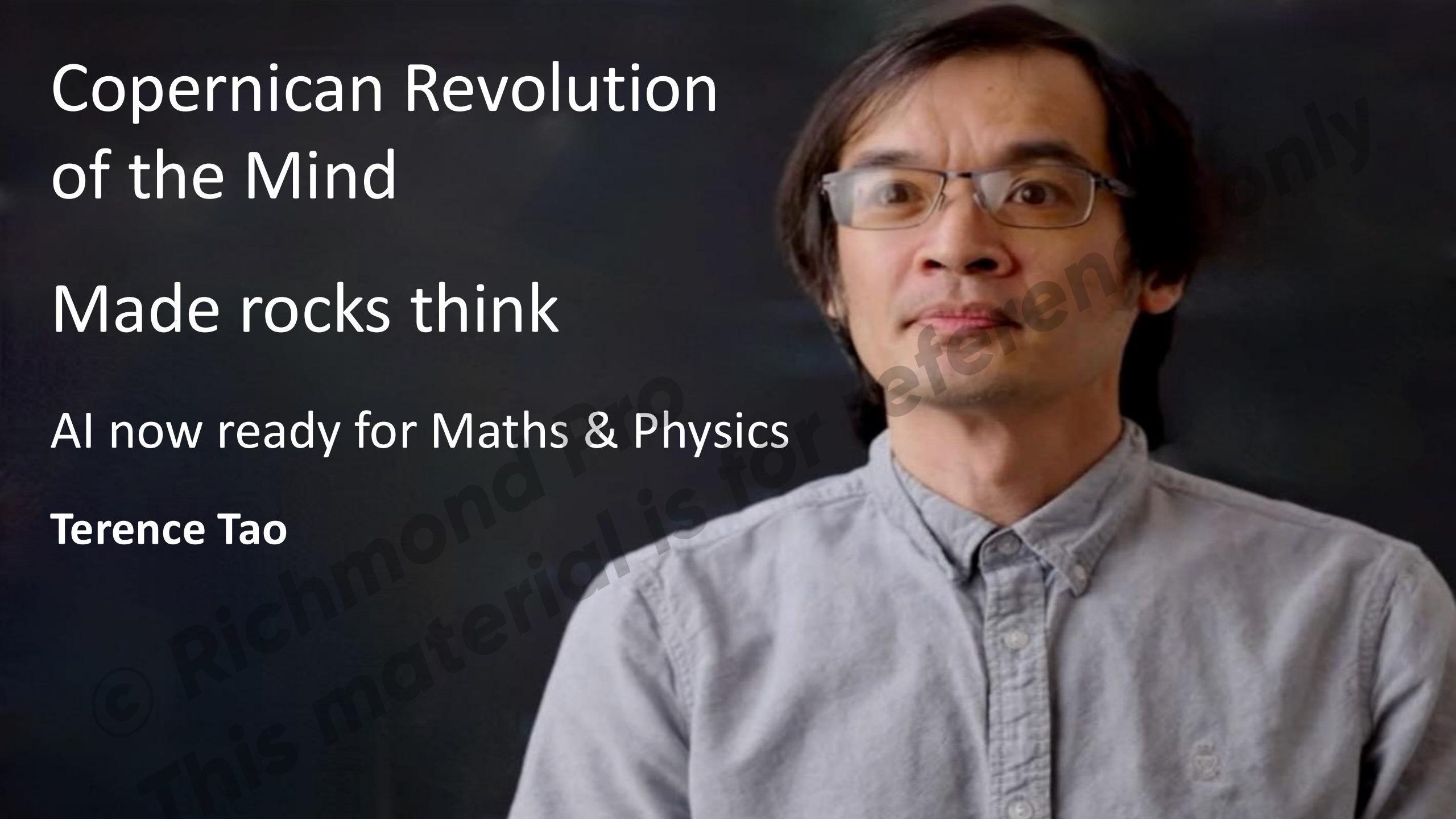
700,000 years

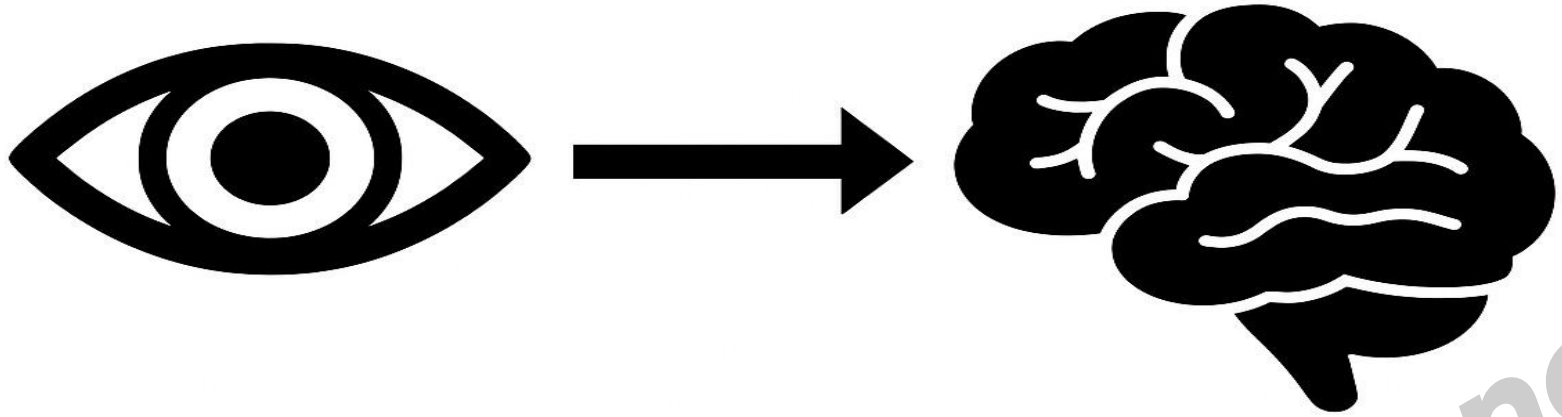
Copernican Revolution of the Mind

Made rocks think

AI now ready for Maths & Physics

Terence Tao





ATTENTION ECONOMY

FOCUS IS CONSUMERISM

Scarcity
Selling us ads
Combative social media
Filters/selfies
Hailing Ubers/Fast food
Online gaming/gambling
Porn/Onlyfans

PRODUCTIVE ECONOMY

FOCUS IS PRODUCTIVITY

Abundance
Personal agency
Healthcare
Education
Robots
Accelerated research
Intelligence

TEACHING

Jill Watson (2016)

Year 1: 350 students

Georgia Tech

Jill Watson (2016)

Year 1: 350 students

Year 2: Ian & Stacey

Some thought that 2 **real** teachers/trainers were **AI**

Harvard CS50

There were 3 tools:

1) '**Explain Highlighted Code**' quick explanations of code
2) Evaluating of **code style tool**
3) CS50 **duck chatbot** for inquiries ChatGPT4 plus RAG

RESULTS

Scaled

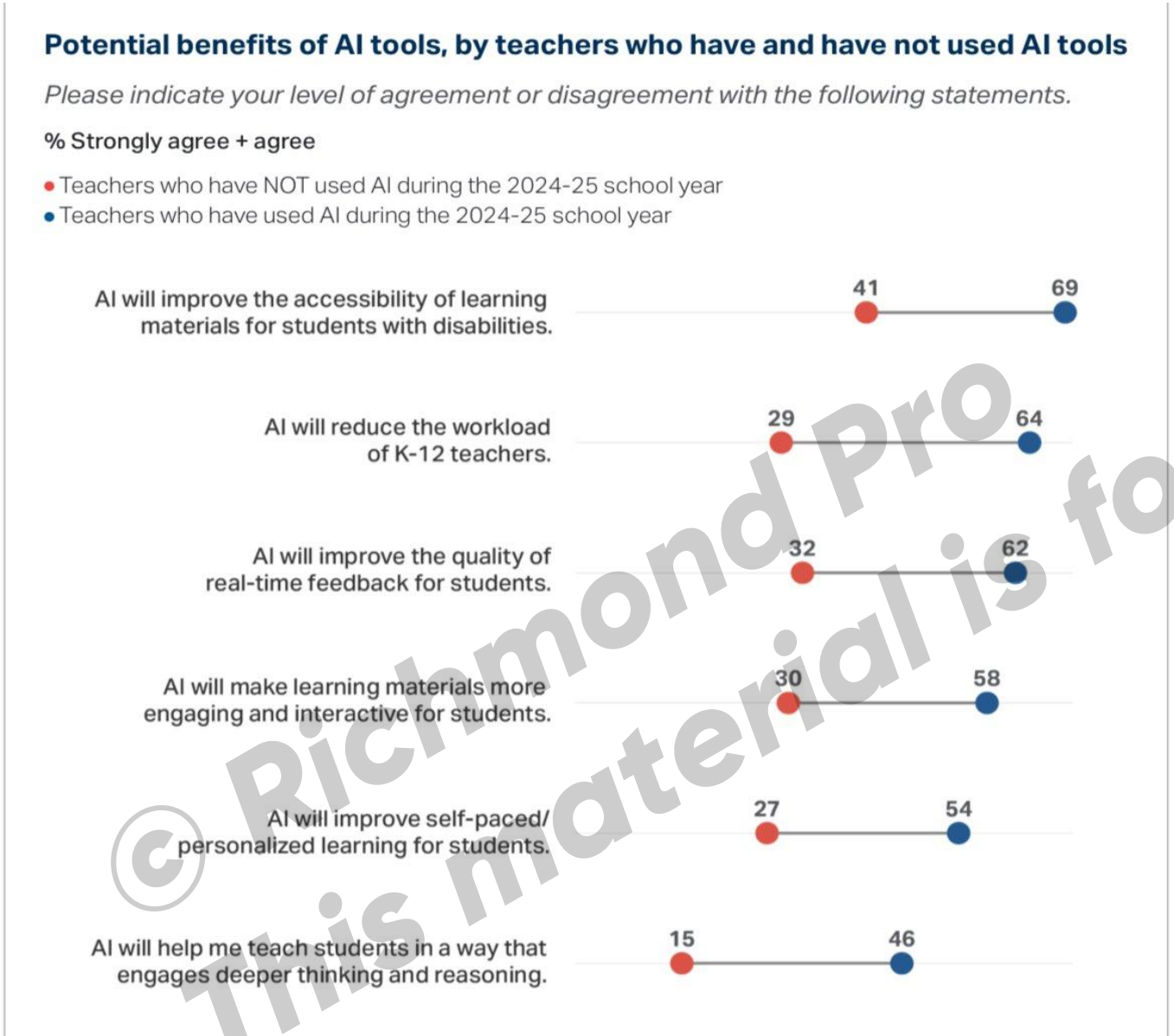
70 -> 500 -> thousands

94% helpful **95%** effective

"Love love loved the duck.
We're friends now."

https://t.co/YaQ85Cnvdl

Can AI enhance teaching?



Teachers who have **used AI more positive** about:

Improved **accessibility**

Reduced **workload**

Real-time feedback

Improved **quality of materials**

Self-pacing

Deeper thinking & reasoning

Can AI enhance teaching?

GALLUP | WALTON FAMILY FOUNDATION

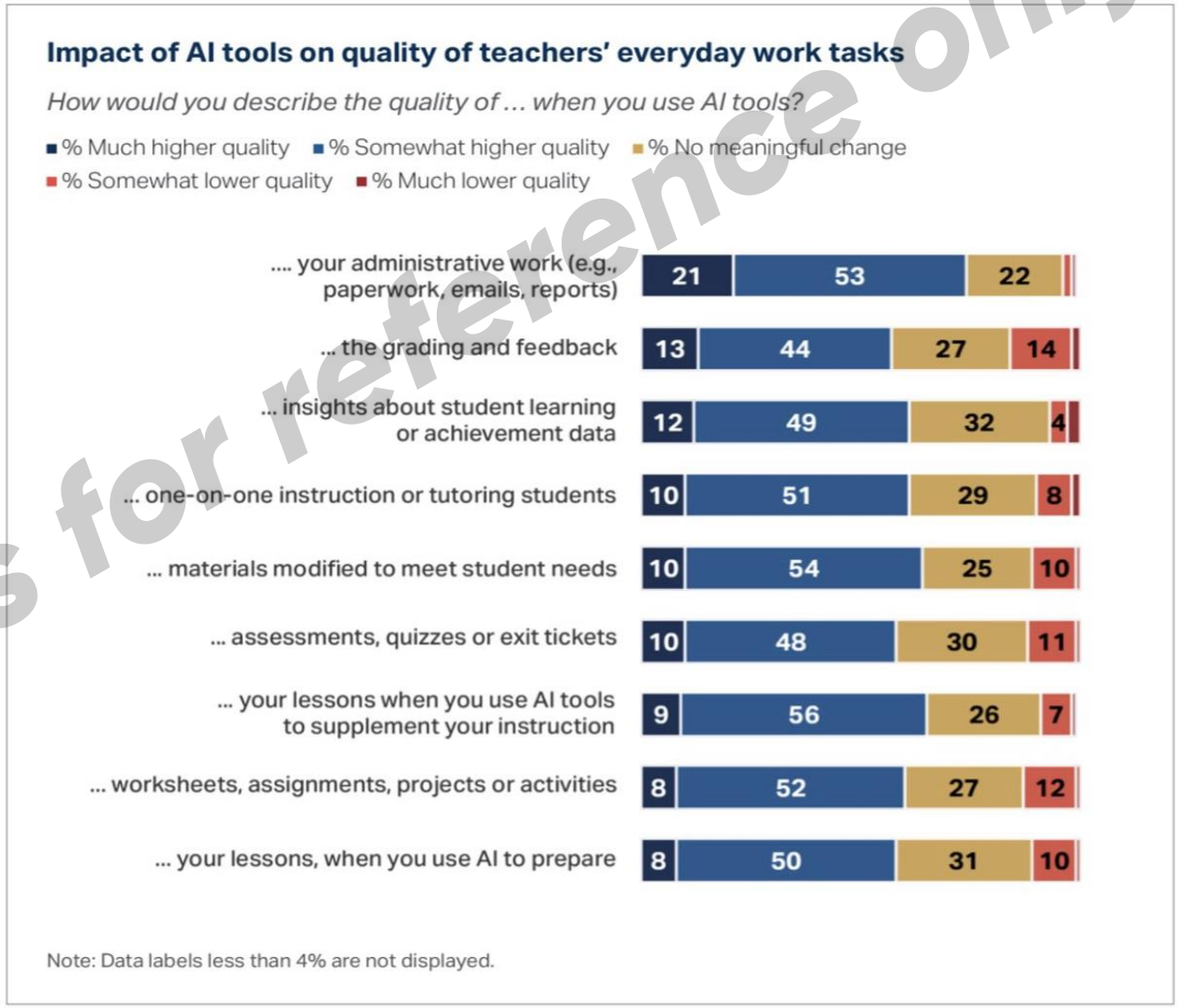
TEACHING FOR TOMORROW

Unlocking Six Weeks a Year With AI

60% used AI

Teachers using AI saved **5.9 hours** per week

Improved **quality** of work



Global Survey
Human-Led Language Learning
Still Irreplaceable in the Age of AI
10 December, 2025

1348 English-language teachers
118 countries

BUT…

57% to **create materials**

53% help learners **practise**

43% create **lesson plans**

48% language learning **apps**

31% **chatbots**

54% **inadequately trained** (AI)

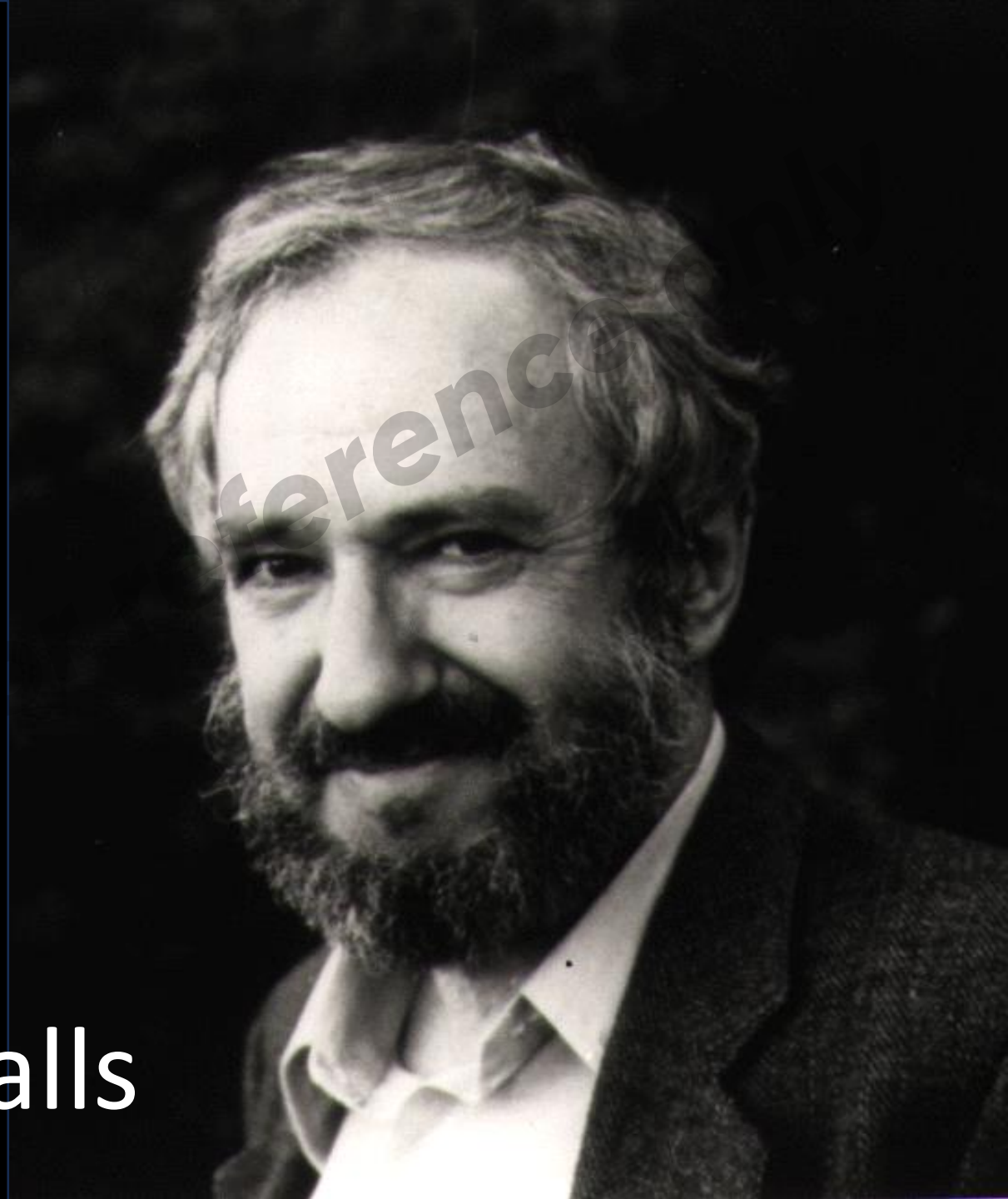
LEARNING

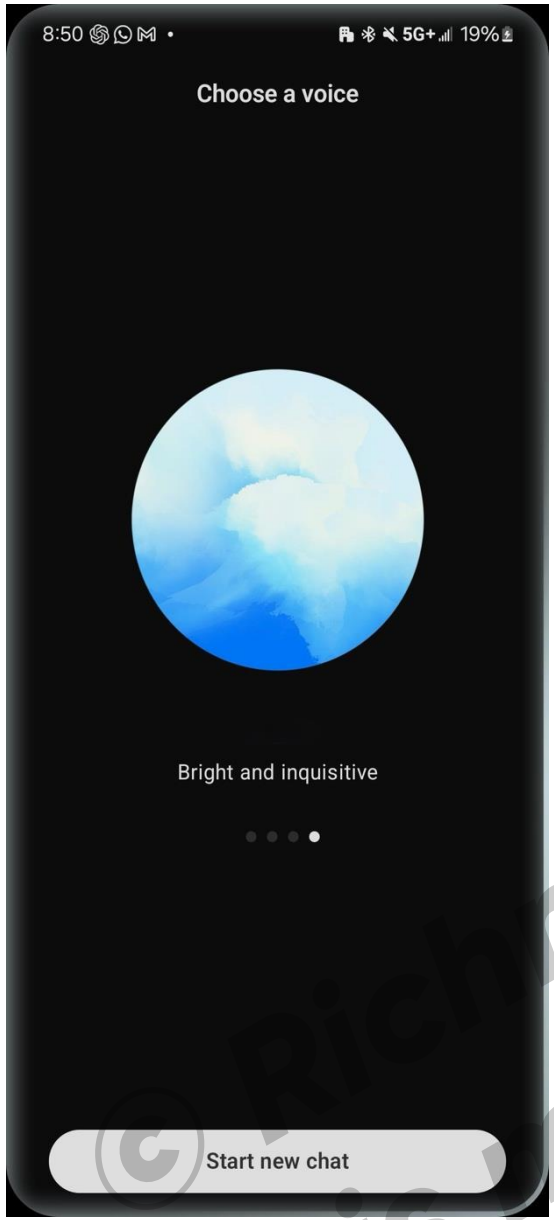
Bottom up/Everyone

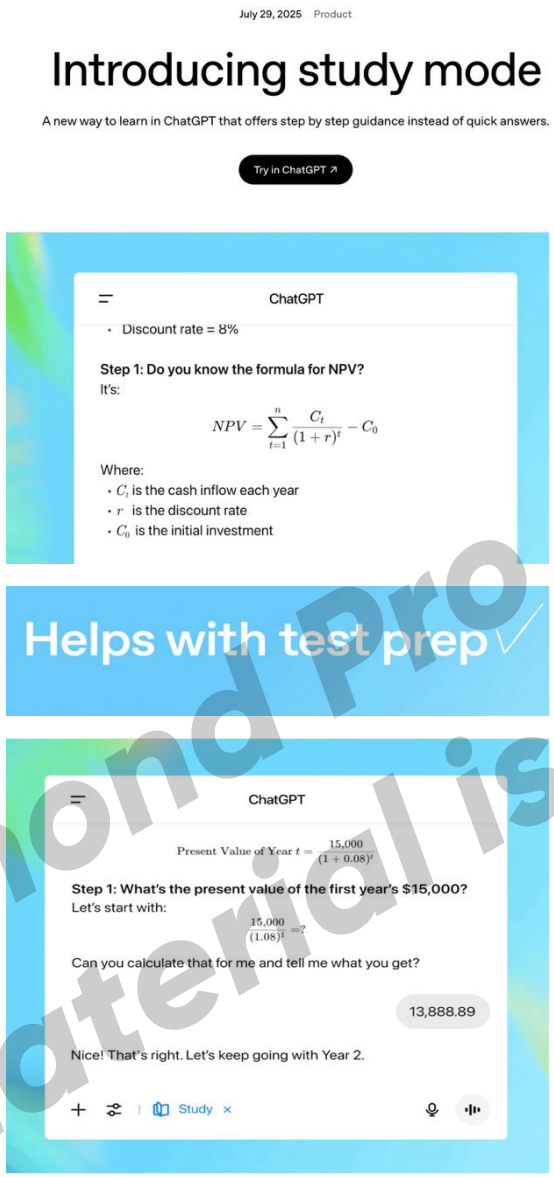
Desirable difficulty

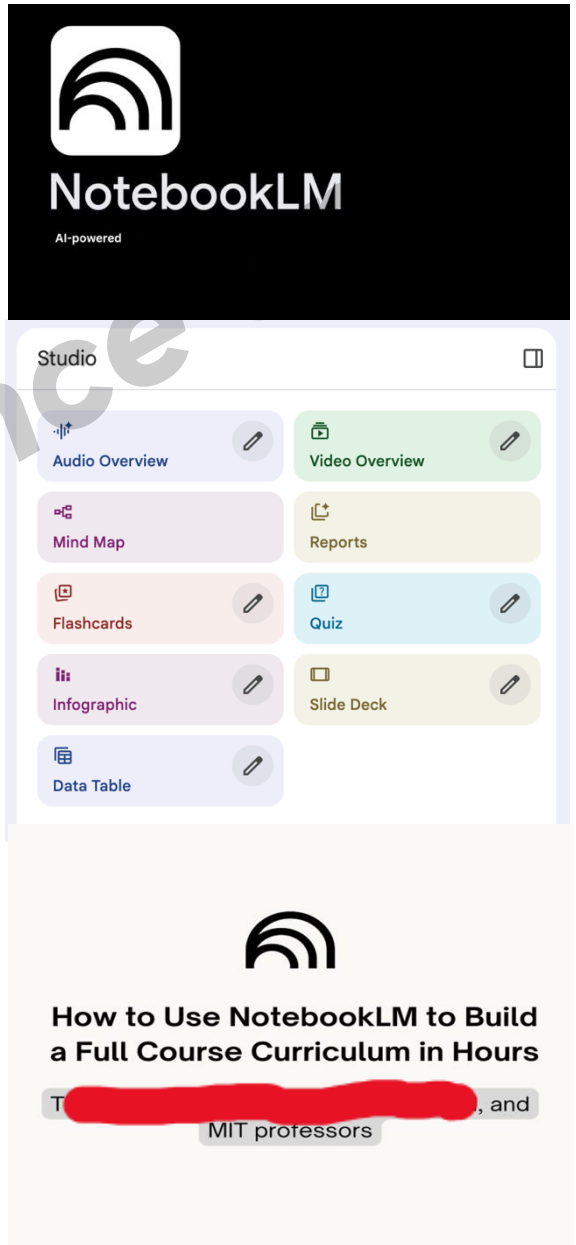
HIGH Ceiling

LOW Floor **WIDE** Walls

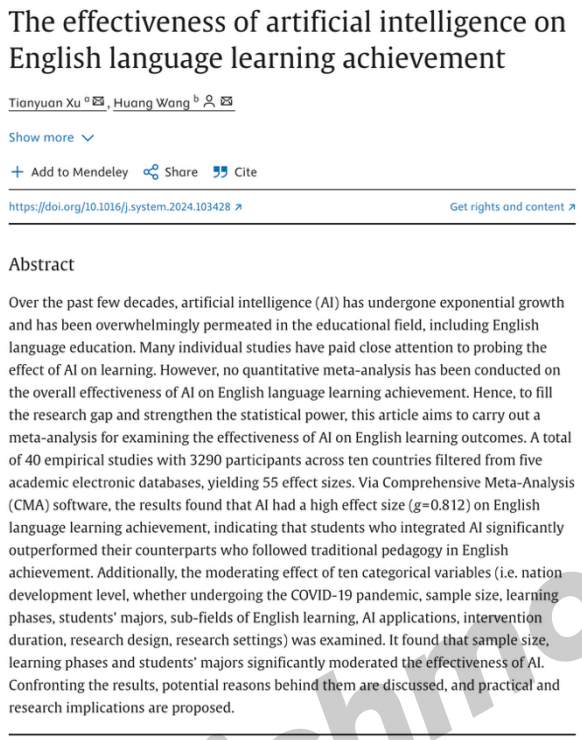








Learning English using AI (40 studies)



The effectiveness of artificial intelligence on English language learning achievement

Tianyuan Xu [a], Huang Wang [b]

Show more

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https://doi.org/10.1016/j.system.2024.103428 Get rights and content

Abstract

Over the past few decades, artificial intelligence (AI) has undergone exponential growth and has been overwhelmingly permeated in the educational field, including English language education. Many individual studies have paid close attention to probing the effect of AI on learning. However, no quantitative meta-analysis has been conducted on the overall effectiveness of AI on English language learning achievement. Hence, to fill the research gap and strengthen the statistical power, this article aims to carry out a meta-analysis for examining the effectiveness of AI on English learning outcomes. A total of 40 empirical studies with 3290 participants across ten countries filtered from five academic electronic databases, yielding 55 effect sizes. Via Comprehensive Meta-Analysis (CMA) software, the results found that AI had a high effect size (g=0.812) on English language learning achievement, indicating that students who integrated AI significantly outperformed their counterparts who followed traditional pedagogy in English achievement. Additionally, the moderating effect of ten categorical variables (i.e. nation development level, whether undergoing the COVID-19 pandemic, sample size, learning phases, students' majors, sub-fields of English learning, AI applications, intervention duration, research design, research settings) was examined. It found that sample size, learning phases and students' majors significantly moderated the effectiveness of AI. Confronting the results, potential reasons behind them are discussed, and practical and research implications are proposed.

Students using AI tools

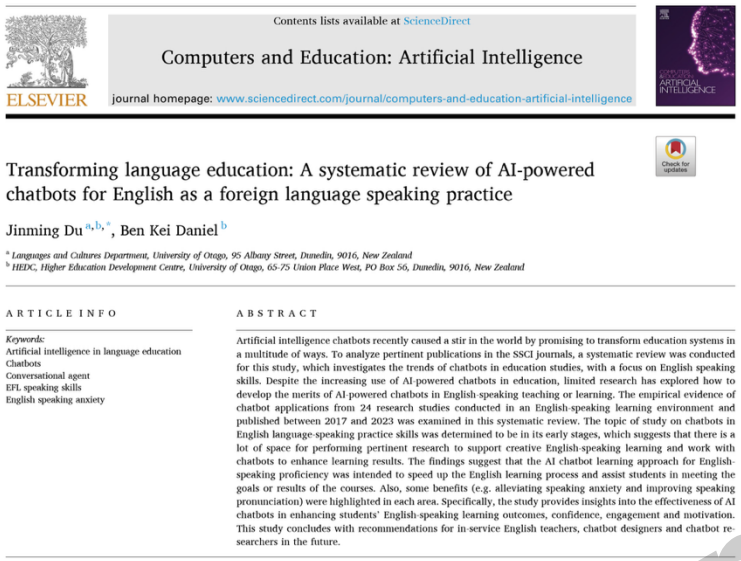
significantly outperformed those who did not

Integration of AI had a

large positive effect (0.81)

Xu, T. and Wang, H., 2024. The effectiveness of artificial intelligence on English language learning achievement. *System*

Learning English using AI (24 studies)



Contents lists available at ScienceDirect

Computers and Education: Artificial Intelligence

journal homepage: www.sciencedirect.com/journal/computers-and-education-artificial-intelligence

Transforming language education: A systematic review of AI-powered chatbots for English as a foreign language speaking practice

Jinming Du [a,b,*], Ben Kei Daniel [b]

[a] Languages and Cultures Department, University of Otago, 95 Albany Street, Dunedin, 9016, New Zealand
[b] HEDC, Higher Education Development Centre, University of Otago, 65-75 Union Place West, PO Box 56, Dunedin, 9016, New Zealand

ARTICLE INFO

Keywords:
Artificial intelligence in language education
Chatbots
Conversational agent
EFL speaking skills
English speaking anxiety

ABSTRACT

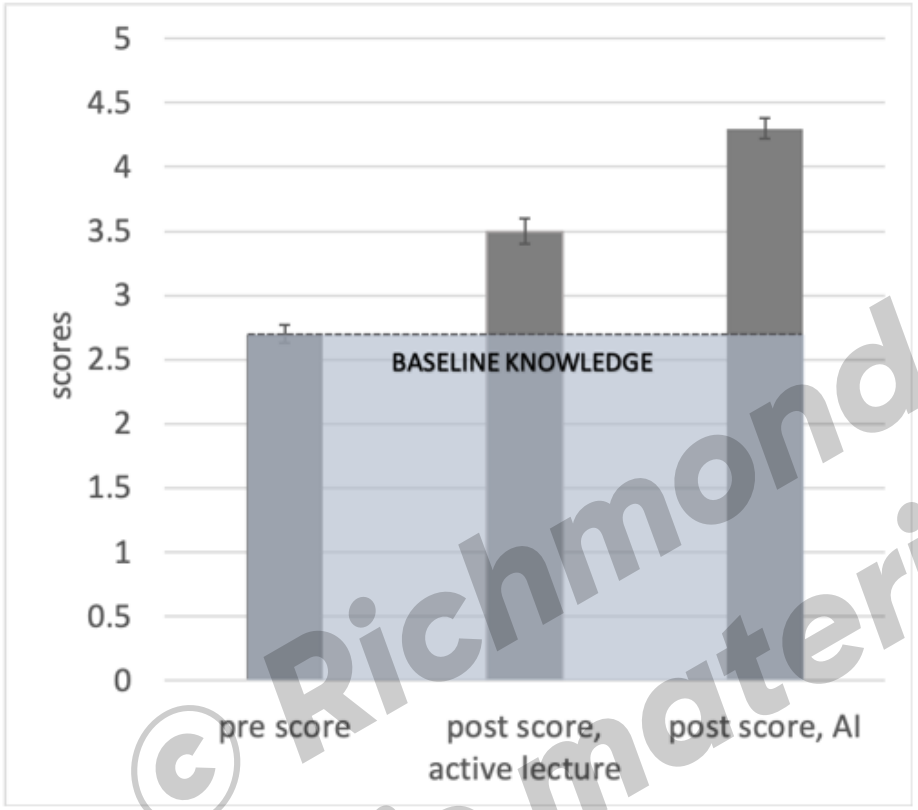
Artificial intelligence chatbots recently caused a stir in the world by promising to transform education systems in a multitude of ways. To analyze pertinent publications in the SSCI journals, a systematic review was conducted for this study, which investigates the trends of chatbots in education studies, with a focus on English speaking skills. Despite the increasing use of AI-powered chatbots in education, limited research has explored how to develop the merits of AI-powered chatbots in English-speaking teaching or learning. The empirical evidence of chatbot applications from 24 research studies conducted in an English-speaking learning environment and published between 2017 and 2023 was examined in this systematic review. The topic of study on chatbots in English language-speaking practice skills was determined to be in its early stages, which suggests that there is a lot of space for performing pertinent research to support creative English-speaking learning and work with chatbots to enhance learning results. The findings suggest that the AI chatbot learning approach for English-speaking proficiency was intended to speed up the English learning process and assist students in meeting the goals or results of the courses. Also, some benefits (e.g. alleviating speaking anxiety and improving speaking pronunciation) were highlighted in each area. Specifically, the study provides insights into the effectiveness of AI chatbots in enhancing students' English-speaking learning outcomes, confidence, engagement and motivation. This study concludes with recommendations for in-service English teachers, chatbot designers and chatbot researchers in the future.

Du, J. and Daniel, B.K., 2024. Transforming language education: A systematic review of AI-powered chatbots for English as a foreign language speaking practice.

"advantages in English language learning are currently **unparalleled**…

proved **highly effective** in enhancing interaction, motivation & oral proficiency of English learners"

GenAI students learn x2 in less time



Harvard's largest **physics** class

In-class v AI-tutor

AI tutored:

Learnt **more than twice** as much in **less time**

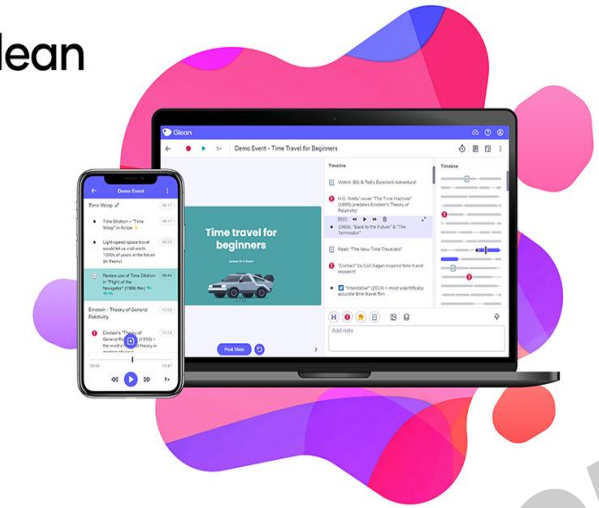
Higher engagement/enjoyment

Higher motivation/growth mindset

AI Tutoring Outperforms Active Learning. Kestin 2024

Builds on note taking with AI

Glean



Compares **notes** with **lecturer transcript**

Automatically splits transcripts & adds relevant headings

Clustered notes – notes to right place

QuizMe - automatically **adds assessment**

Can AI harm learning? YES (2024)

Generative AI Can Harm Learning

Hamsa Bastani,[1*] Osbert Bastani,[2*] Alp Sungu,[1*†]
Haosen Ge,[3] Özge Kabakcı,[4] Rei Mariman

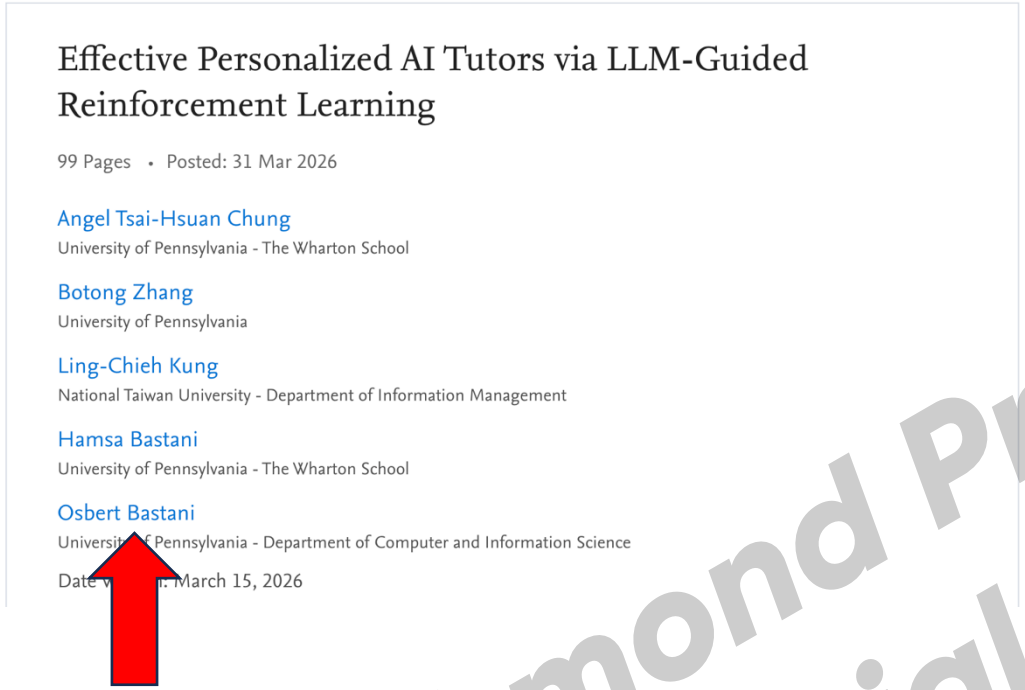
[1]Operations, Information and Decisions, University of Pennsylvania
[2]Computer and Information Science, University of Pennsylvania
[3]Wharton AI & Analytics, University of Pennsylvania
[4]Budapest British International School

OLD model GPT4 (8 since)

NOT:

- **strong on tutoring**
- **diagnose misconceptions**
- **ask probing questions**
- **sequence the way a good human tutor would**

Can AI harm learning? NO (2026)



Effective Personalized AI Tutors via LLM-Guided Reinforcement Learning

99 Pages • Posted: 31 Mar 2026

Angel Tsai-Hsuan Chung
University of Pennsylvania - The Wharton School

Botong Zhang
University of Pennsylvania

Ling-Chieh Kung
National Taiwan University - Department of Information Management

Hamsa Bastani
University of Pennsylvania - The Wharton School

Osbert Bastani
University of Pennsylvania - Department of Computer and Information Science

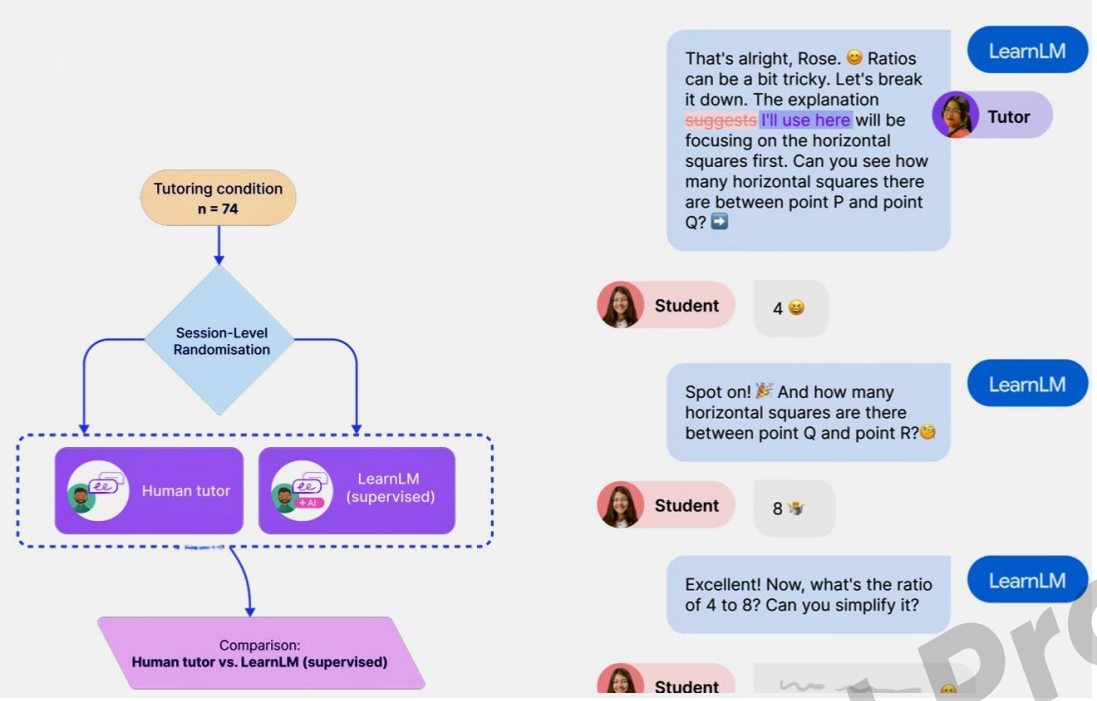
Date written: March 15, 2026

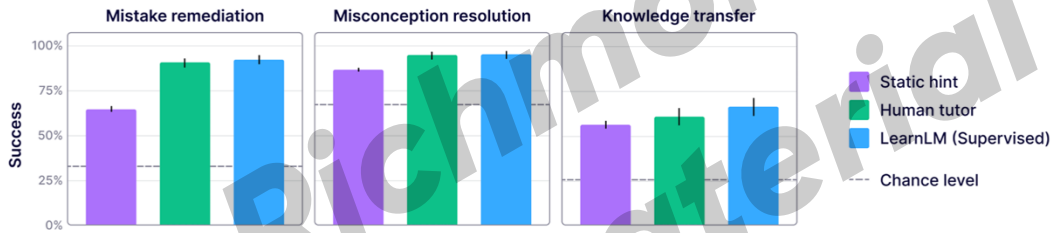
Desirable difficulty (Bjork)

- No direct answers/solutions
- Strong on tutoring, diagnosis, probing questions, sequencing

Improved performance on exam:

- Equiv. to 6–9 months additional schooling
- No increase teacher workload
- Better for less able students





Google's LearnLM

Chat-based maths tutor **Eedi**

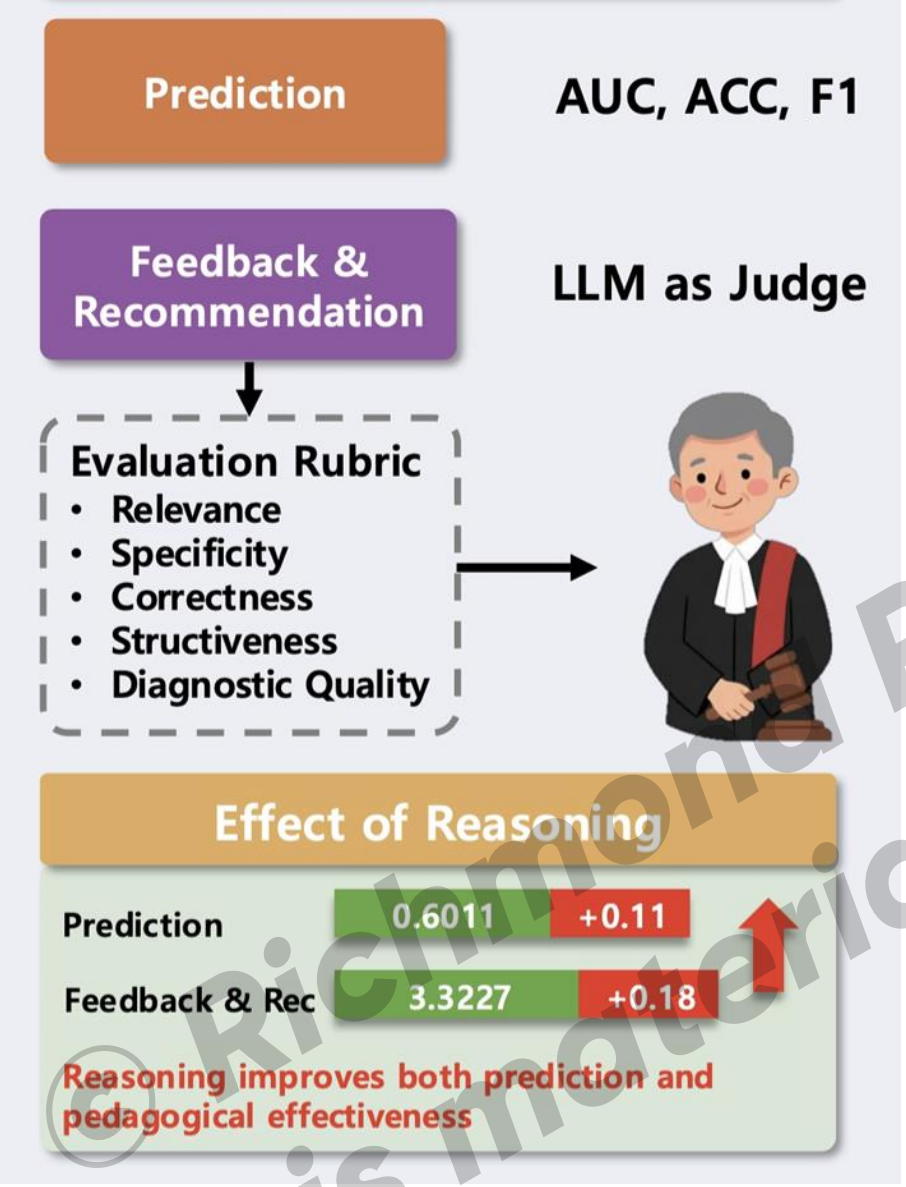
AI model tuned for **pedagogy**

Novel problem-solving:

- Human-tutor students **60.7%**
- LearnLM students **66.2%**

Students guided by AI performed better than human tutors

LearnLM Team, Google and Eedi (**Nov 2025**) *AI tutoring can safely and effectively support students: An exploratory RCT in UK classrooms*

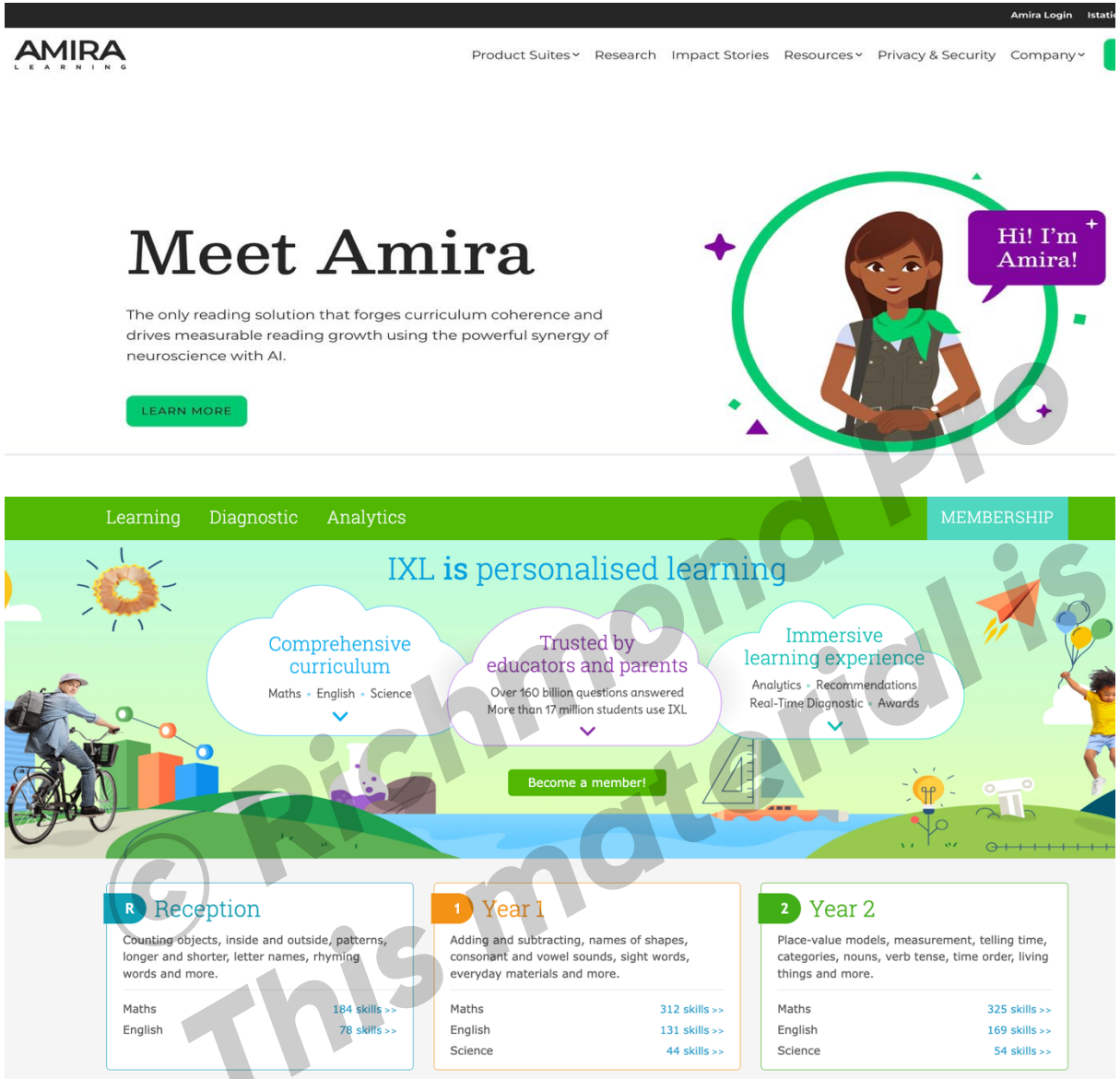


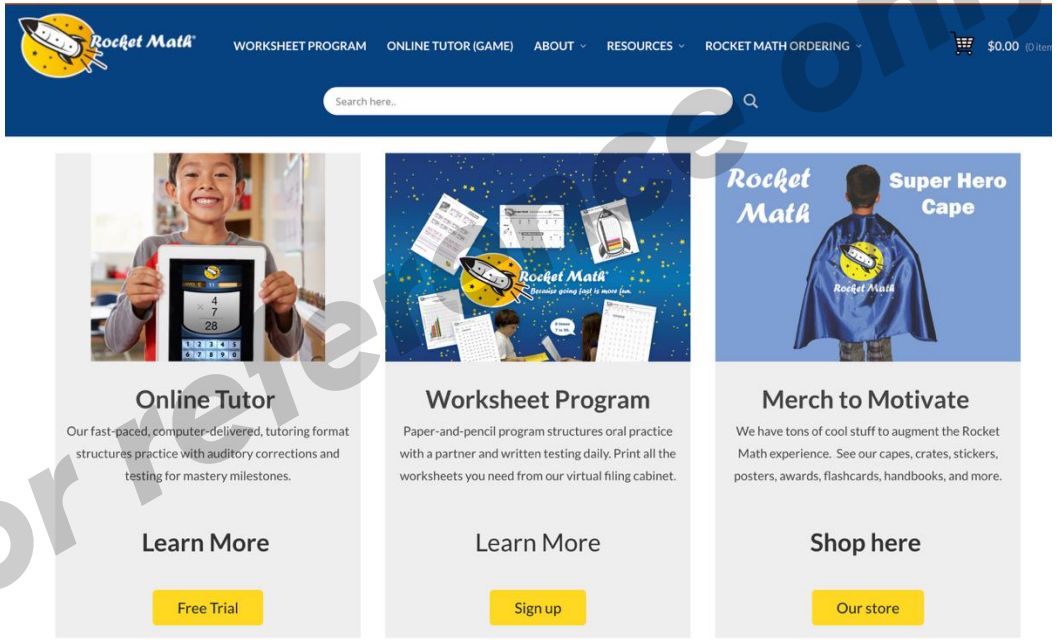
AI becoming **BETTER TEACHERS**:

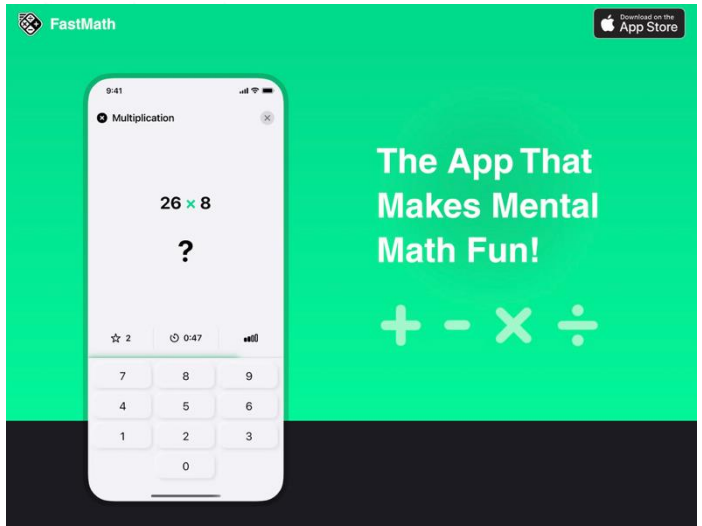
- **Consumer models**
- With **memory** of learner
- **Reasons** about student learning, not just give answers

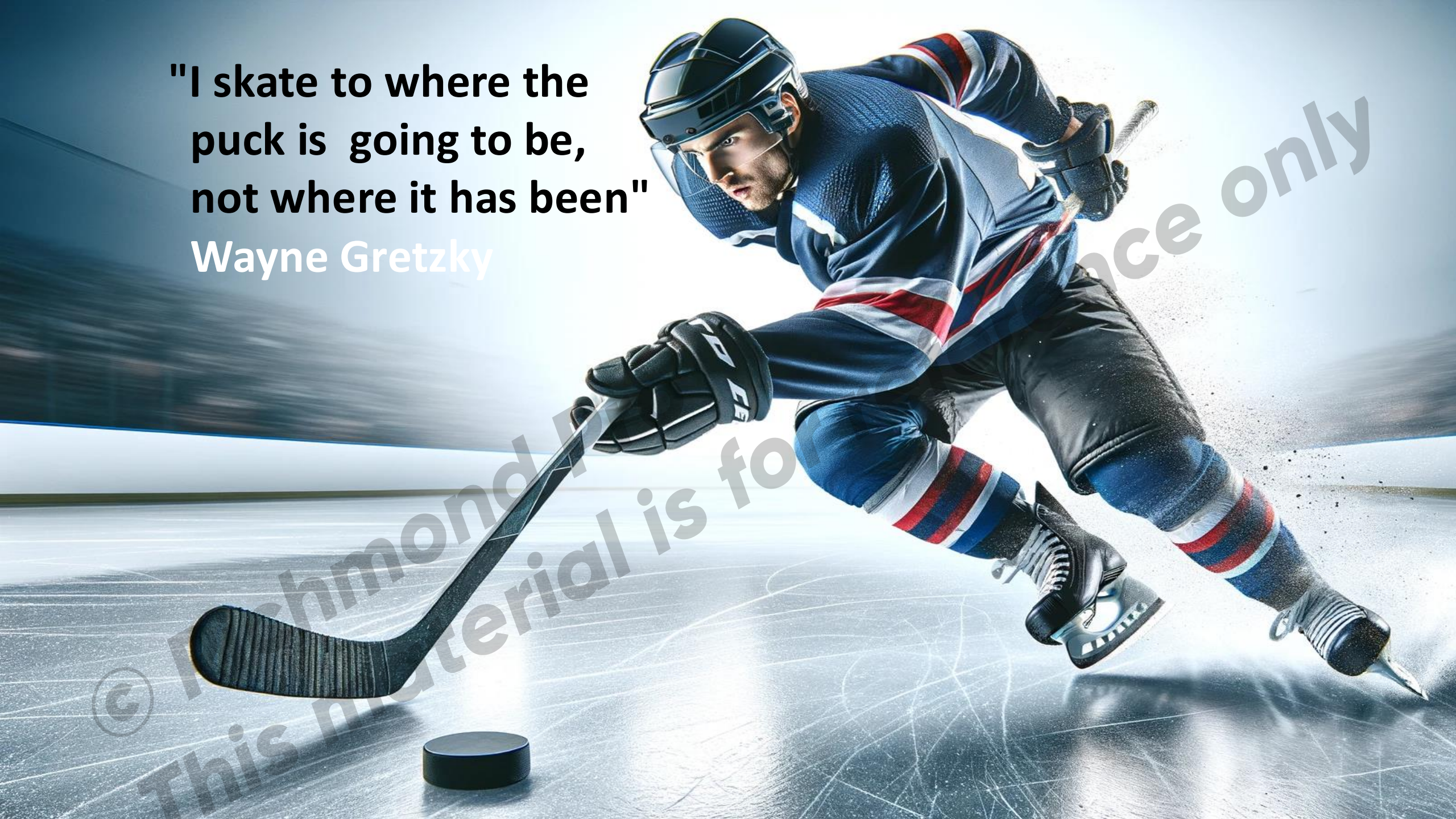
Lee, U. et al. **2026**. A Training-Free Large Reasoning Model-based Knowledge Tracing Framework for Unified Prediction and Prescription

ALPHA SCHOOL: Use best of breed apps….








"I skate to where the
puck is going to be,
not where it has been"
Wayne Gretzky

ASSESSMENT

Cheating is not new

Don’t blame students

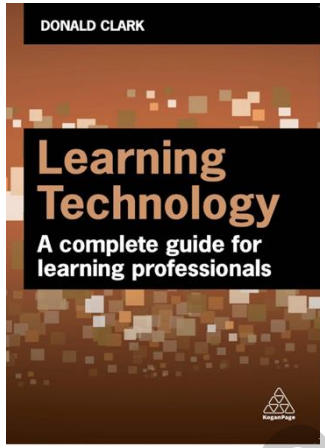
No silver bullet

Josephson Institute (Schools)

51% cheated on tests

74% used another student's coursework

32% copied Internet doc on assignments



Whitley's (College students)

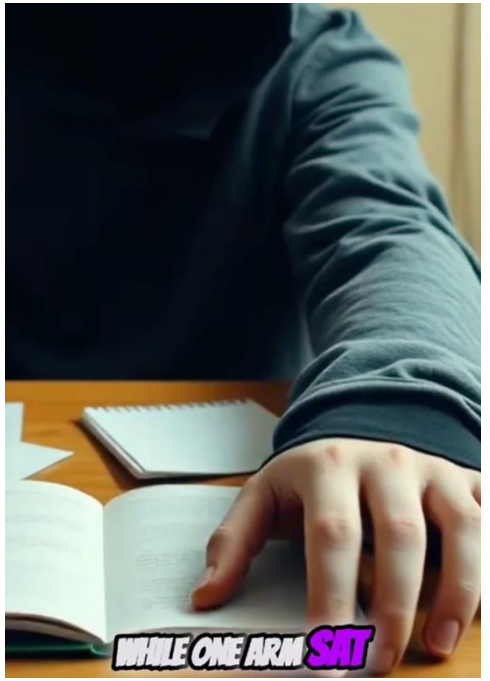
70% at least one act of academic dishonesty

43% on exams

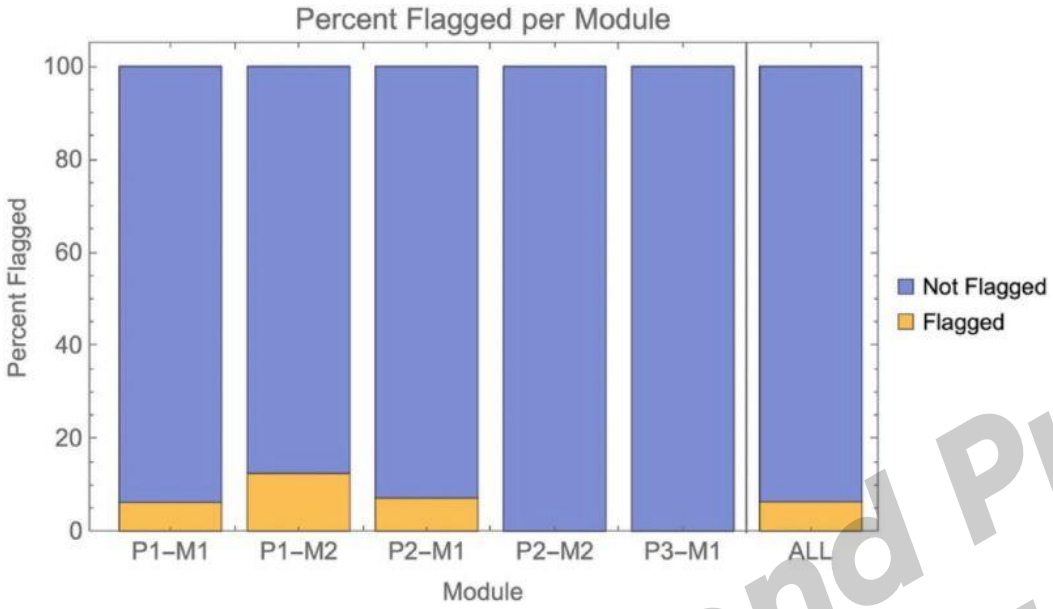
41% on coursework

47% plagiarised

Medical student surgically implants Bluetooth device into own ear to cheat in final exam



Can human markers detect AI?



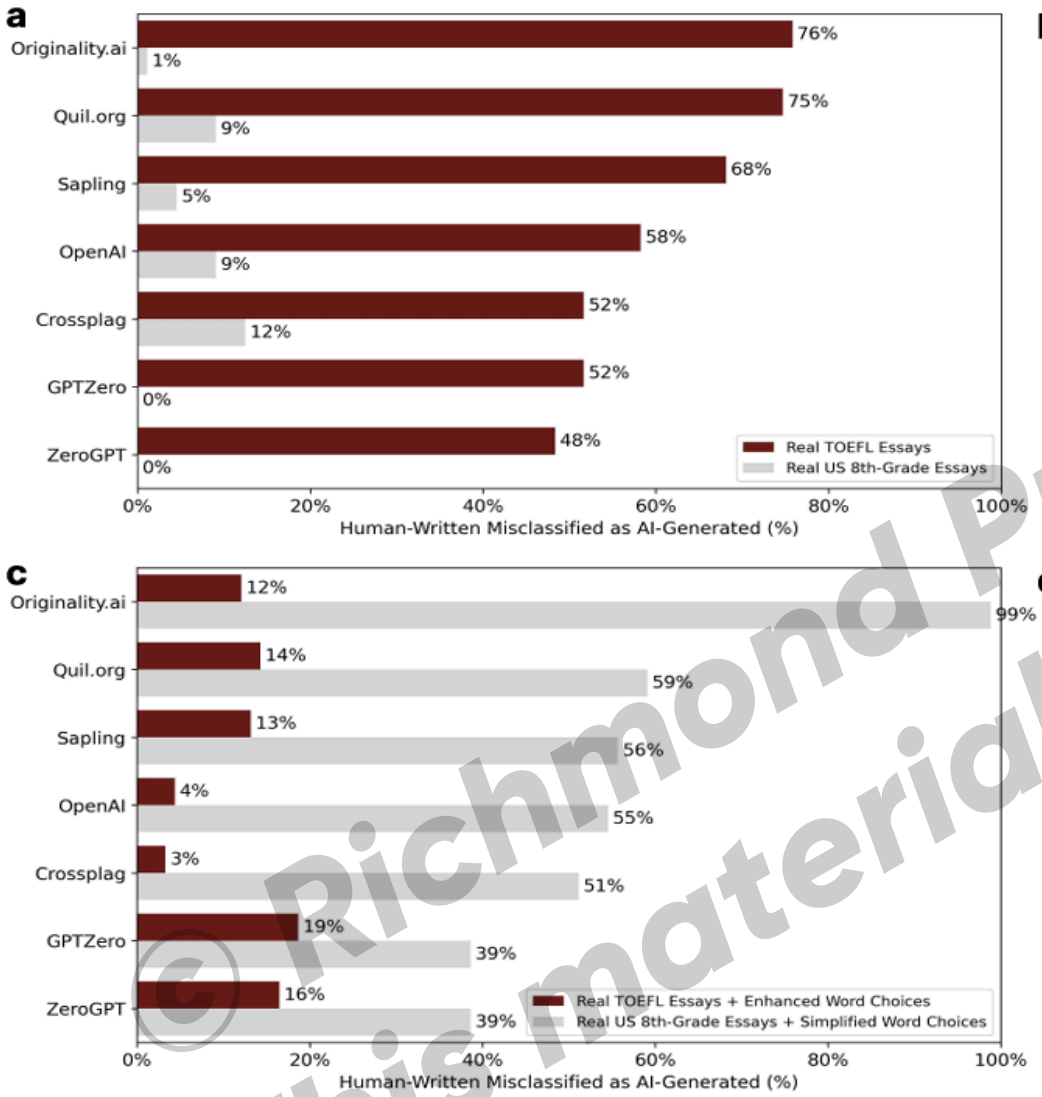
SEEDED GenAI submissions into exam system:

- five undergrad modules
- across all years BSc Psychology (UK)

94% AI submissions undetected

Scarfe, P. et al. 2023. A real-world test of artificial intelligence infiltration of a university examinations system: a “Turing Test” case study.

Plagiarism checkers **DO NOT** work…..



DO NOT use detectors:

- Don’t work
- Don’t use your gut
- False positives
- Consistently accuse non-native speakers of cheating

Students **KNOW** this tech

Liang et al GPT detectors are biased against non-native English writers

AI detection is dead (call for abolition)

Routledge
Taylor & Francis Group

Journal of Higher Education Policy and Management

ISSN: 1360-080X (Print) 1469-9508 (Online) Journal homepage: www.tandfonline.com/journals/cjhe20

Heads we win, tails you lose: AI detectors in education

Mark Andrew Bassett, Wayne Bradshaw, Hannah Bornsztejn, Alyce Hogg, Kane Murdoch, Bridget Pearce & Colin Webber

Numbers looks authoritative, they are NOT

Turnitin training data (700k papers < 2019)

Validation methods all wrong

If tools can't be verified, process can't be fair

Way forward? **Assessment redesign**, NOT surveillance

- oral components
- process documentation
- reflective tasks

Bassett, M. A. et al. 2026. Heads we win, tails you lose: AI detectors in education. Journal of Higher Education Policy & Management.

WHY AI-GENERATED TEXT DETECTION FAILS: EVIDENCE FROM EXPLAINABLE AI BEYOND BENCHMARK ACCURACY

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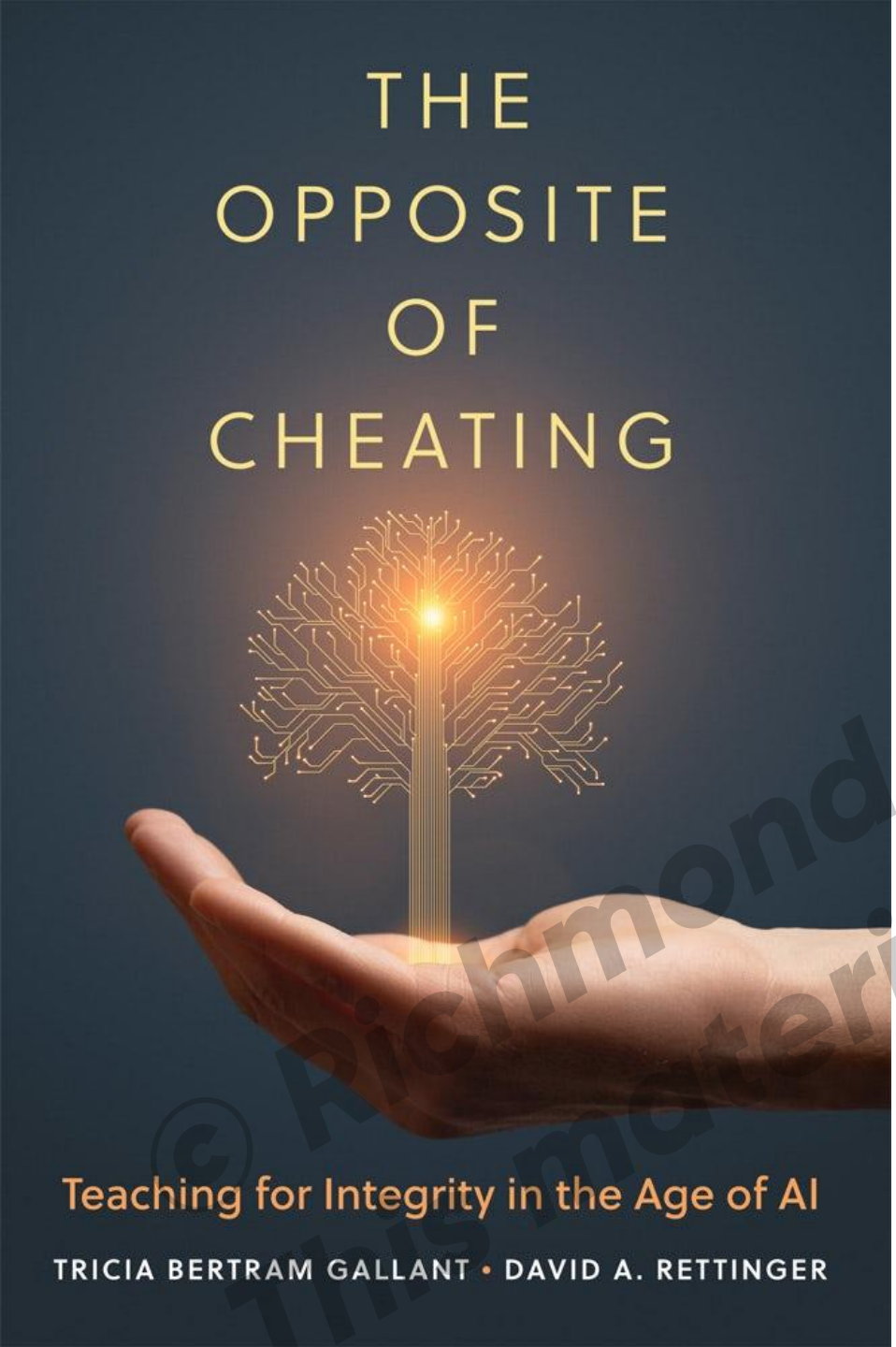
ABSTRACT

The widespread adoption of Large Language Models (LLMs) has made the detection of AI-generated text a pressing and complex challenge. Although many detection systems report high benchmark accuracy, their reliability in real-world settings remains uncertain, and their interpretability is often unexplored. In this work, we investigate whether contemporary detectors genuinely identify machine authorship or merely exploit dataset-specific artefacts. We propose an interpretable detection framework that integrates linguistic feature engineering, machine learning, and explainable AI techniques. Evaluated across two major benchmark corpora—PAN-CLEF 2025 and COLING 2025—models trained on 38 linguistic features achieve leaderboard-competitive performance, attaining an F1 score of 0.9734 without reliance on large-scale language models.

However, systematic cross-domain and cross-generator evaluation reveals substantial generalisation failure: classifiers that excel in-domain degrade significantly under distribution shift. Using SHAP-based explanations, we show that the most influential features differ markedly between datasets, indicating that detectors often rely on dataset-specific stylistic cues rather than stable signals of machine authorship. Further investigating this, we perform an in-depth error analysis, applying SHAP to False Negatives and False Positives from the model.

Our findings show that benchmark accuracy is not reliable evidence of authorship detection: strong in-domain performance can coincide with substantial failure under domain and generator shift. Our in-depth error analysis exposes a fundamental tension in linguistic-feature-based AI text detection: the features that are most discriminative on in-domain data are also the features most susceptible to domain shift, formatting variation, and text-length effects. We believe that this knowledge helps in building AI detectors that are robust under different settings. To support replication and practical use, we release an open-source Python package that returns both predictions and instance-level explanations for individual texts.

Project Page: https://shushantatud.github.io/ExplainAIGeneratedText/



Don't blame students

No silver bullet

More formative

Multimodal assessment

Automate assessment

TEST CENTRES

AI should be a GUIDE, not Ghostwriter
Support learning, not replace it
Learning science recommends:

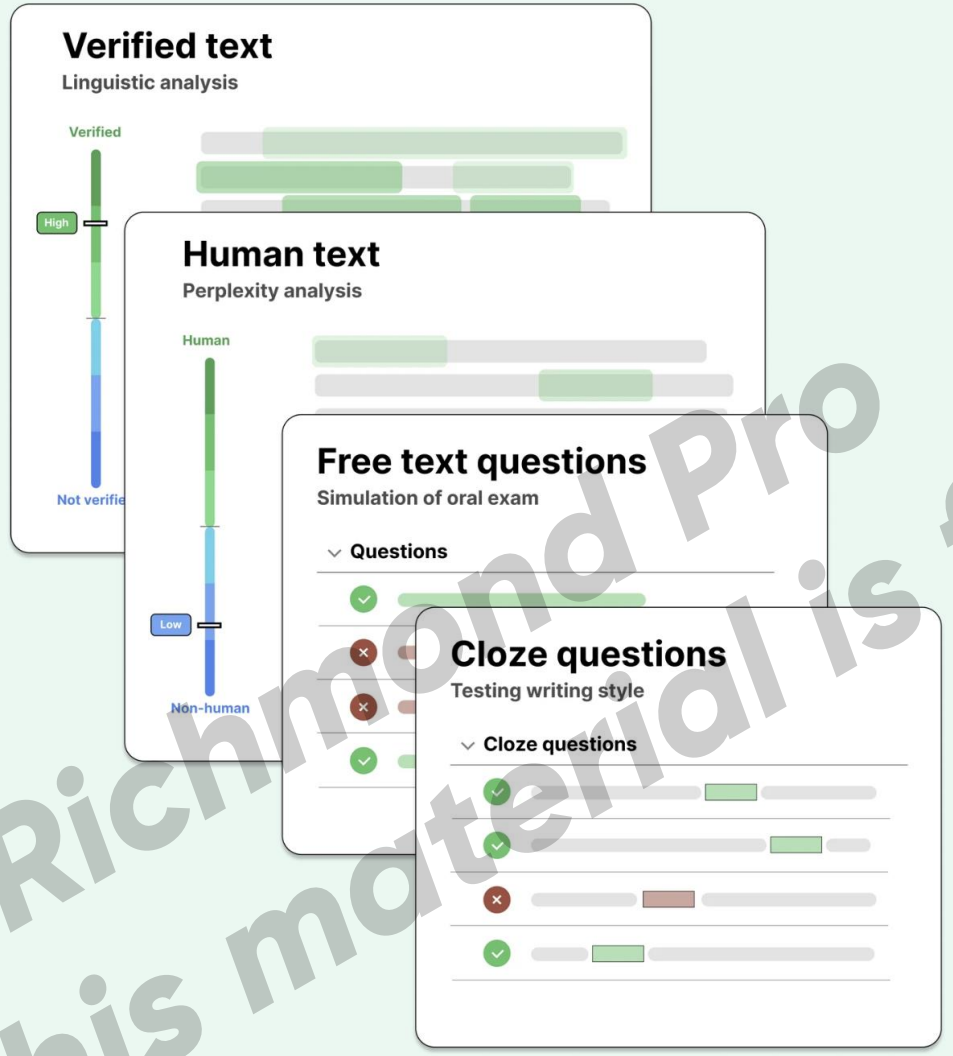
- desirable difficulty
- scaffolding
- generative learning

Not to outsource thinking but critique, question & guide your effort...

https://donaldclarkplanb.blogspot.com/2026/03/ai-should-be-guide-not-ghostwriter.html

norvalid

Catch cheating



Verified text — Linguistic analysis

Comparing the submission with the student's unique linguistic fingerprint.

Human text — Perplexity analysis

Measuring the perplexity of the text to determine if it is human-written (opposite of AI detection).

Free text questions — Simulation of oral exam

Confirming the student's knowledge by asking simple questions about their submission.

Cloze questions — Testing writing style

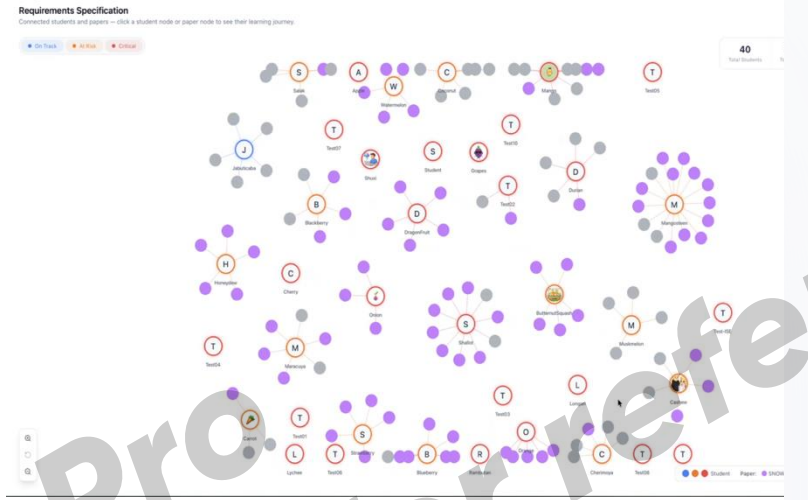
Testing the student's ability to fill in missing words from their own sentences.

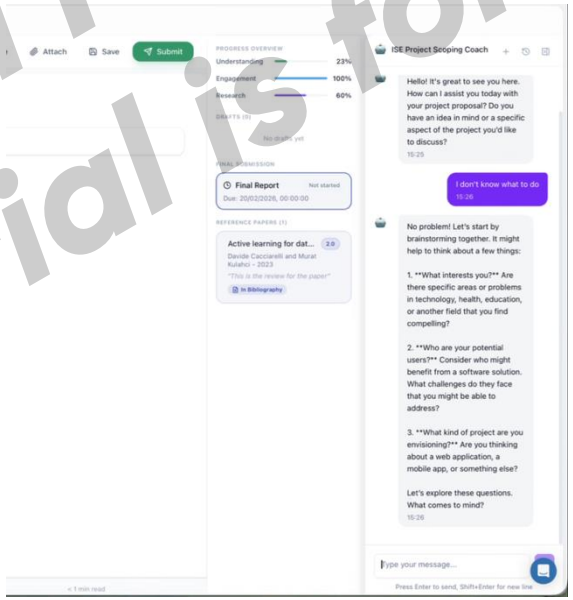
Change behaviour

Full online environment
Student activity tracked
Knowledge graphs
Agents

Embedded chatbot

Student queries
almost zero





Support genuine learning with *real-time insights.*

Empower your institution with visibility into the learning journey. STUDI tracks engagement, ensures academic integrity, and helps educators provide support where it's needed most.

Process Transparency
Monitor drafts and reading behaviors.

Integrity Guard
Identify AI-generated vs. authentic effort.

Scaffolded Learning
Step-by-step guidance.

Intervention Alerts
Spot students who are struggling early.

Library Integration
Connected to institutional repositories.

Teaching-driven AI
Bots that prompt thinking, not just answers.

EMPLOYABILITY

Prepare for shocks

JOB ADS

Entry level jobs disappearing

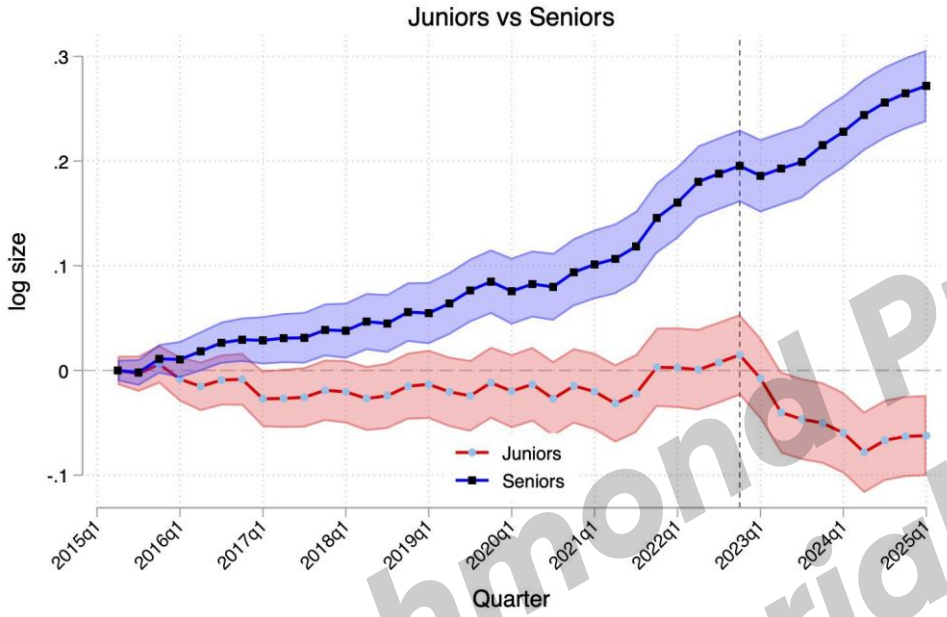
22–25 AI-exposed jobs show

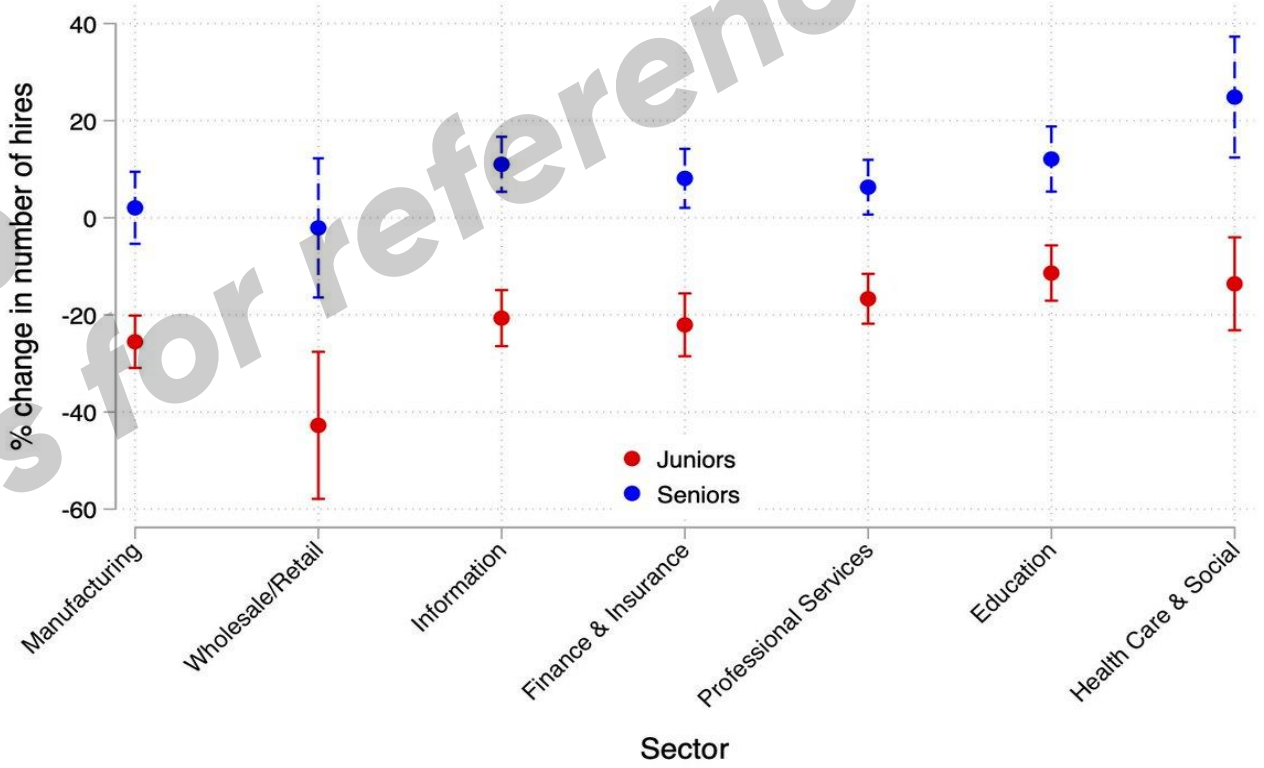
13% decline

Older workers stable or growing

Canaries in the Coal Mine? Six Facts about the Recent Employment Effects of Artificial Intelligence. Stanford University **2025**

285,000 US firms, **150 million** jobs, **62 million** workers (2015-2025), **>245 million** job postings





Hosseini & Lichtinger. Generative AI as Seniority-Biased Technological Change: Evidence from U.S. Résumé and Job Posting Data, Harvard **Aug 31 2025**

Jobs at risk

AI and Coder Employment: Compiling the Evidence

Leland D. Crane* Paul E. Soto*

March 20, 2026

500,000 less coders

Bundled	v	Unbundled
Teachers		Translators
Project managers		Writers
Doctors		Proofreaders
Nurses		Administrators
Plumbers		Paralegals
Carpenters		Call centre staff
Chefs		Drivers (huge)

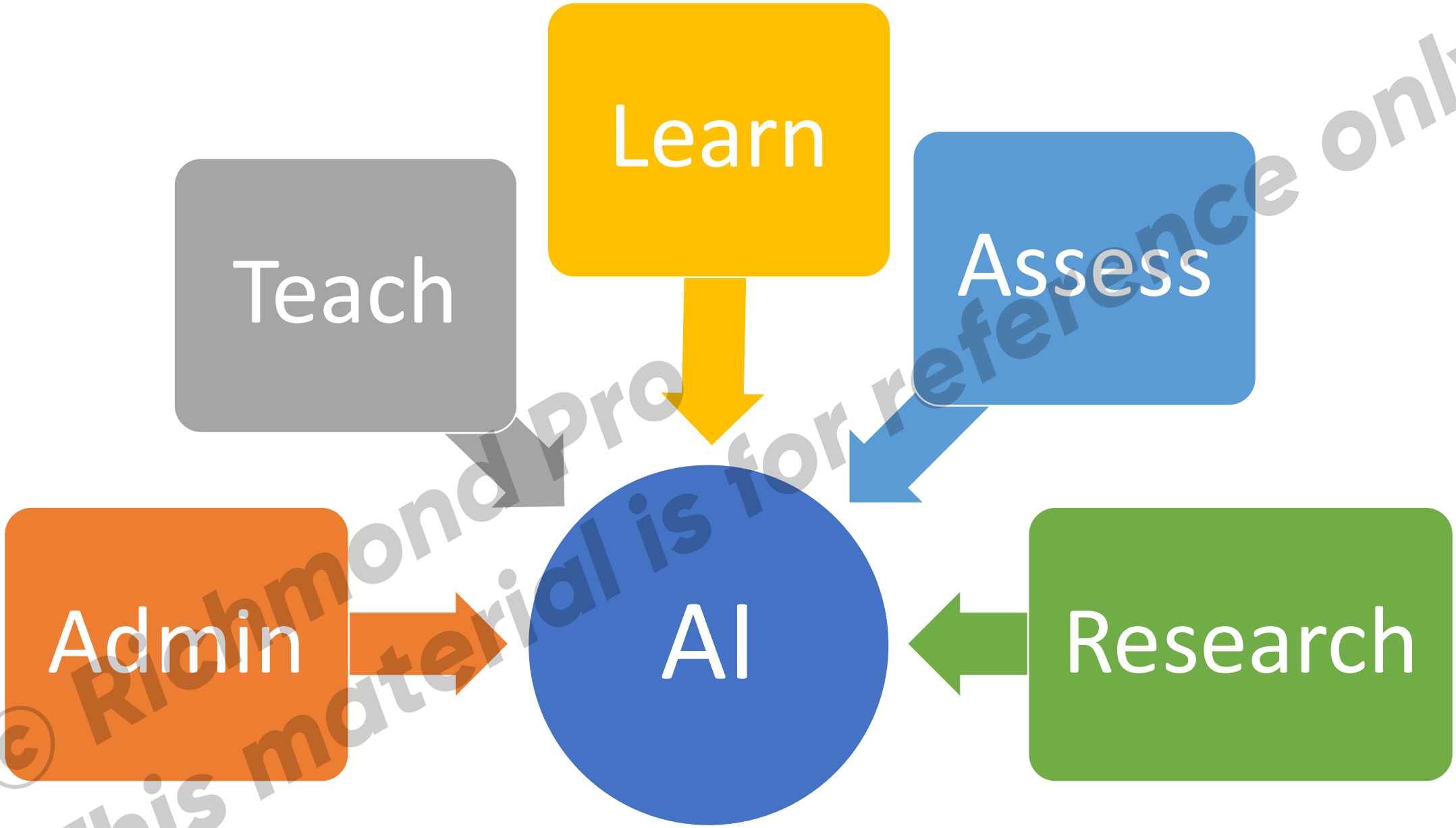
If 1 robot makes 1 robot in 1 week

How many made in 1 year?

4,503,599,627,370,496

(4.5 quadrillion robots!)

STRATEGY

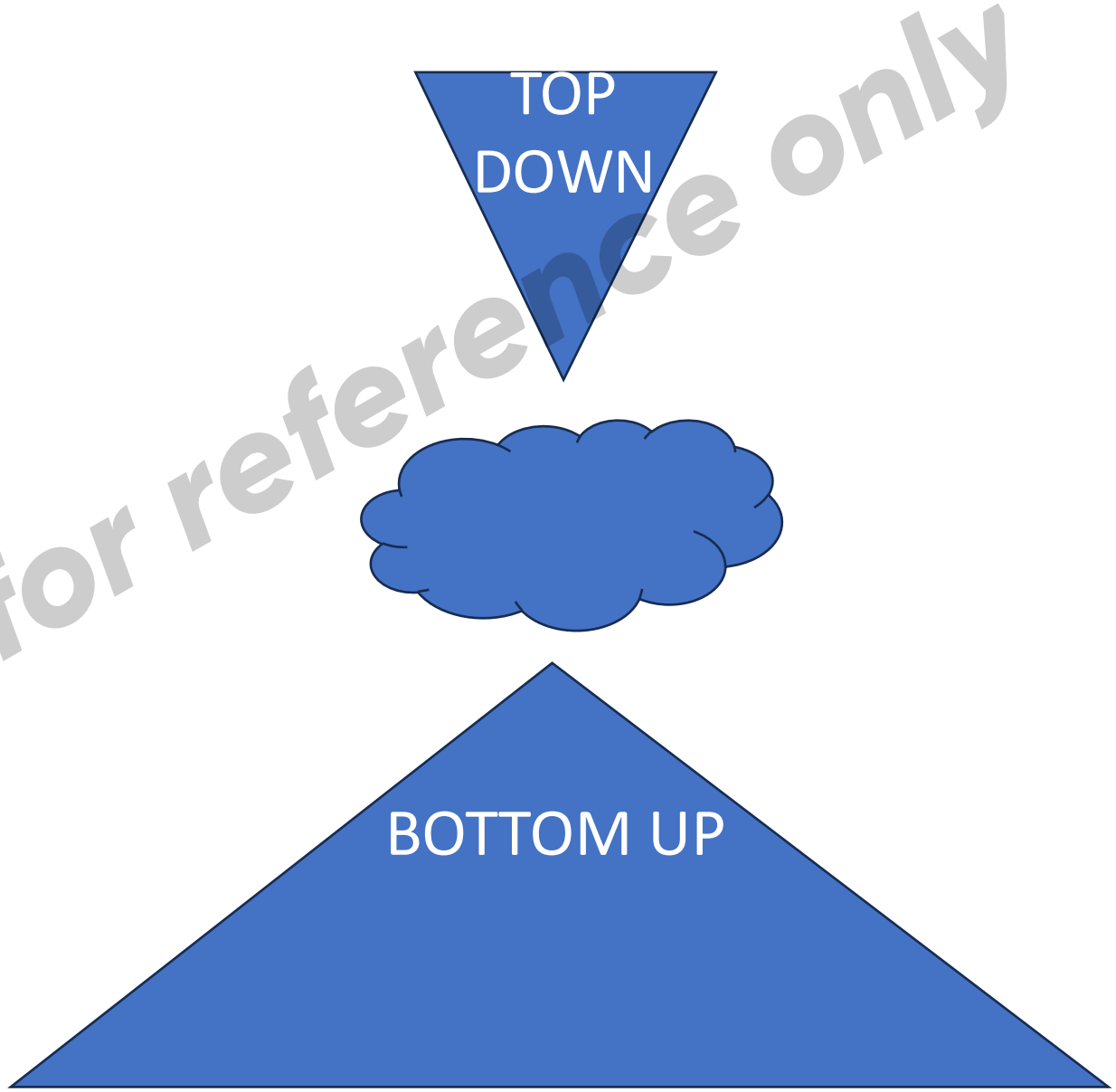


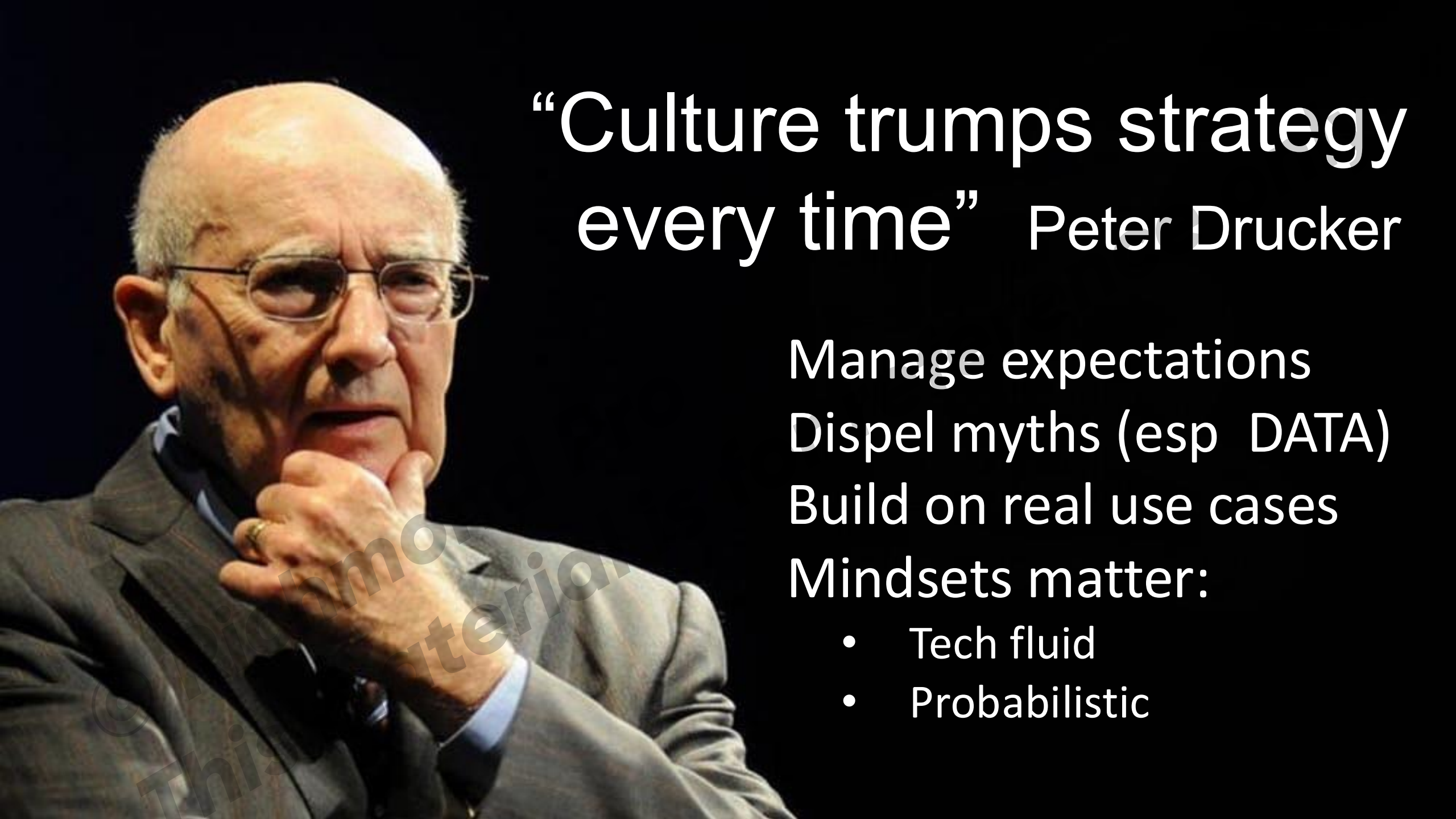
Strategic AI

Leadership team driven
Inject across institution

Brand initiative
HUB – small team

Permission to prompt
Students
Faculty
Admin

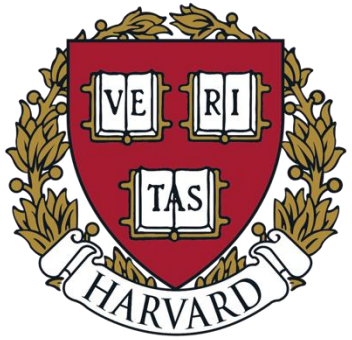




“Culture trumps strategy every time” Peter Drucker

Manage expectations
Dispel myths (esp DATA)
Build on real use cases
Mindsets matter:

- Tech fluid
- Probabilistic



Course specific

Scaled

CS50

- **Explain code**
- **Evaluate code**
- **CS50 duck chatbot**

70 > 500 > 1000s

94% helpful
95% effective

Services Platform

ALL 100,000 faculty, admin & students

Suite of GenAI tools

Equity of access

Massive use

Bottom-up

ALL researchers, staff & faculty get GenAI

Open challenge to invite faculty and staff to **submit ideas** for ChatGPT

Scaled Strategy

ALL 500,000 students & faculty

Training all students/faculty/staff

Personalised tutoring
Study guides

Curriculum dev. tools

Connect with **apprenticeships** in AI industry

Embedded

Generative AI tools
Clarity **Platform**

Infrastructure:
Significant **GPU** & **cloud GPU** spend

Faculty & AI seed grants
Poorvu Center for Teaching & Learning

Tools, content & assess
Research **seed grant** program

Centralised Library AI-powered tools

Strategic move

$50 to $200 million

Across ALL disciplines

UChicago News

HOME LATEST NEWS EXPLAINERS PODCASTS SERIES FOR JOURNALISTS

$50 million gift to advance UChicago research and support faculty in AI

Gift from Rika and Joe Mansueto launches a nearly $200 million initiative to recruit and retain leading scholars across disciplines

Thanks for listening

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