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Transforming teaching with AI: supporting the development of future skills

Andrew J Field
Senior Product Development Manager, International Education

15-16 July 2026

Cambridge Schools Conference, July 2026
Future-ready: preparing learners to thrive

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Housekeeping

- Health and safety
- Fire safety
- Washrooms

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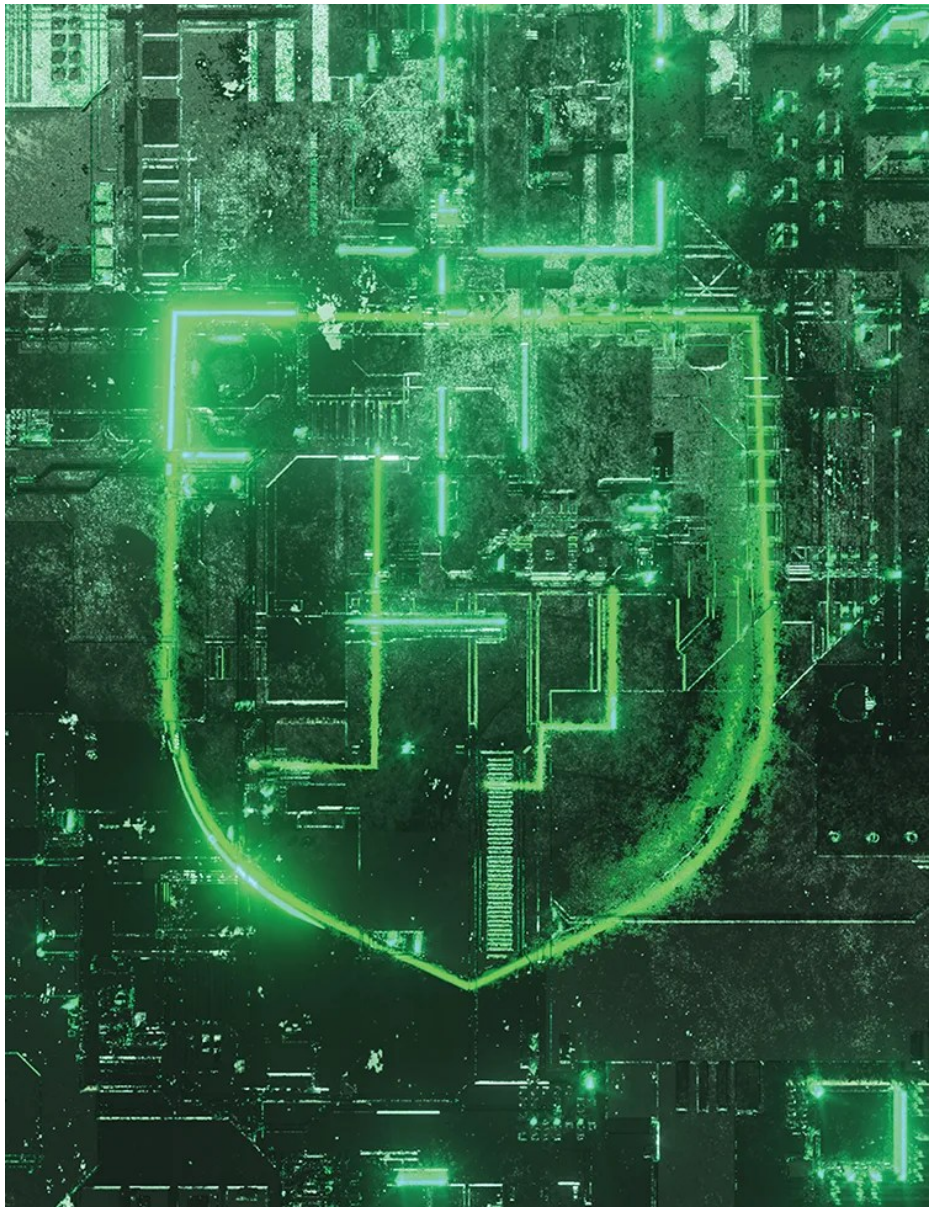
Agenda

- Self-evaluation.
- The era of AI - future skills.
- Activity 1: Provocations.
- Activity 2: Dissecting practical examples.
- Real classroom impact.
- Follow-up items.



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Self-evaluation

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AI and education - where are you?

Concerned and skeptical	Excited and ready
Hopeful but hesitant	Optimistic yet cautious

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AI and education - where are you?

‘I’m worried about where this is going.’	‘Yeah! I’ve got this – let’s get on with it!’
‘I want to believe… but I’m still unsure.’	‘I’m hopeful, but I’m watching closely.’

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The era of AI - future skills

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2023

‘We’re at the cusp of using AI for probably the biggest positive transformation that education has ever seen.’

Sal Khan

founder of Khan Academy

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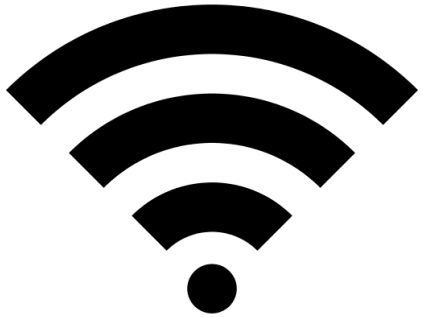
Haven’t we been here before?



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Teachers' changing perceptions

Fear

'AI is going to replace teachers'

2023

Utility

'Huge opportunities to enable'

2024

Validity

'Show me how these tools deliver impact'

2025

Getting started with AI in the Classroom

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Teachers' perceptions - 2026

- Maturity, not resistance.
- Shift from experimentation to intent.
- Teachers filtering the hype themselves.
- Purposeful.

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Fundamental importance of the teacher

EdTech & AI *can* transform – but only by enhancing teaching and learning.

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2026

‘AI tutoring… It doesn’t necessarily make students motivated to learn or fill in gaps in knowledge needed to ask questions.’

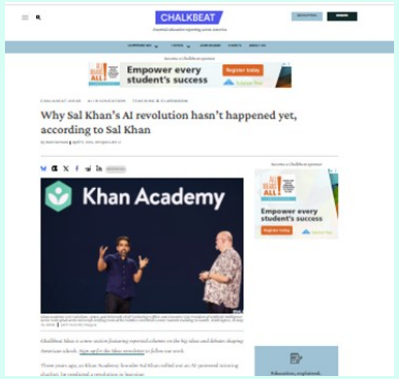
Sal Khan

founder of Khan Academy

CHALKBEAT IDEAS AI IN EDUCATION TEACHING & CLASSROOM

Why Sal Khan’s AI revolution hasn’t happened yet, according to Sal Khan

By Matt Barnum | April 9, 2026, 10:11pm GMT+1



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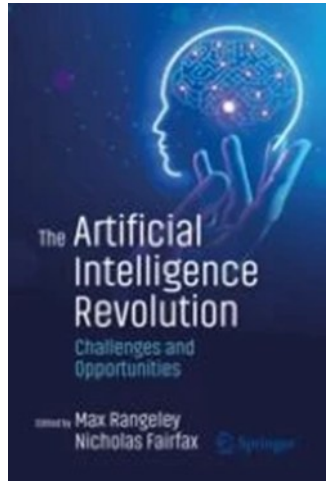
Cognitive offloading

- Accessing information ≠ constructing knowledge

- Learning depends on:
  - Active cognitive effort
  - Practice in recall, explanation, and sense-checking

- Tools that remove effort too early can weaken:
  - Conceptual understanding
  - Procedural memory
  - Long-term retention



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Provocations

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In your group

- You are advising a fellow school leader
- They have asked you a question
- How would you respond?

You have 12 minutes

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Sharing your suggestions

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1

Should school leaders be more worried about students misusing AI - or about staff underusing it?

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2

When students use AI, are they cheating - or developing the skills they need for the future?

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3

If AI can generate answers instantly, what future skills become more important than ever?

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4

If AI can provide instant feedback 24/7, what does that mean for the role of the teacher in the classroom?

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5

I am overwhelmed with AI – there's something new every day. What should I do?

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6

If AI can do more of the work, what should students still struggle with themselves?

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If AI can do more of the work, what should students still struggle with themselves?

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Dissecting practical examples

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In your group

- You have tools to explore.
- How well do they develop future skills?

- What works well?
- What would be even better?

You have 12 minutes

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Sharing your suggestions

- Which did you explore?
- How effective in developing future skills?

- What works well?
- What would be even better?

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Real classroom impact

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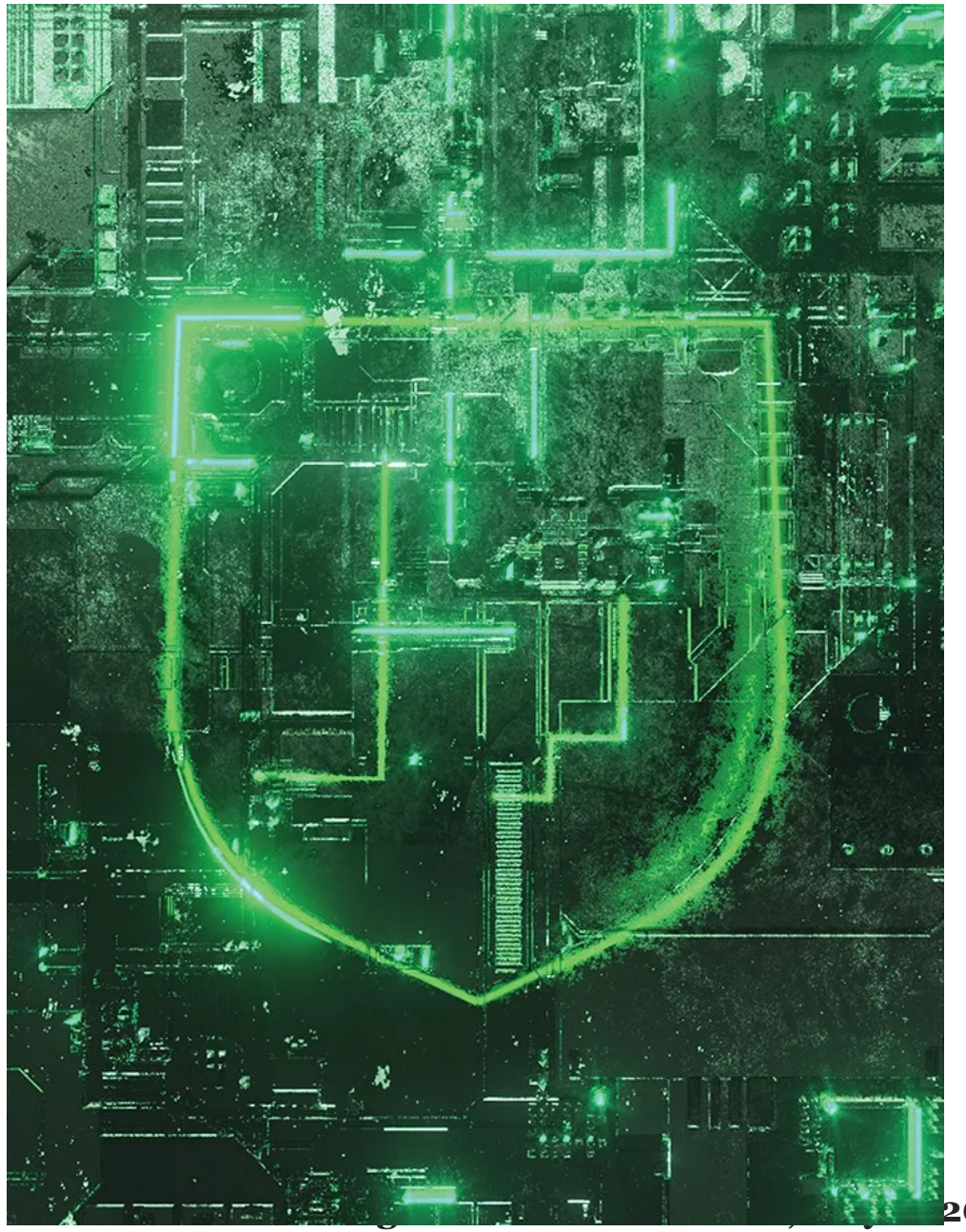
What does this really mean?

- Future ready skills.
- Teachers and learners as decision-makers.
- AI augments, never replaces.
- Impact comes from pedagogy.
- Intentional, responsible use.



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AI is powerful, but without discipline it can short-circuit learning.

Responsible use means choosing when AI adds value - and when thinking must stay with the learner.

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Ask not how I can use AI, but how I can enable joyful, purposeful, and impactful learning.

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Feedback

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Any questions?

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Follow-up items

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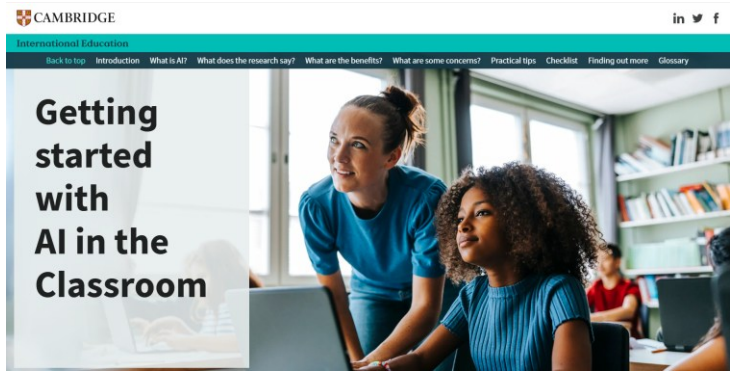
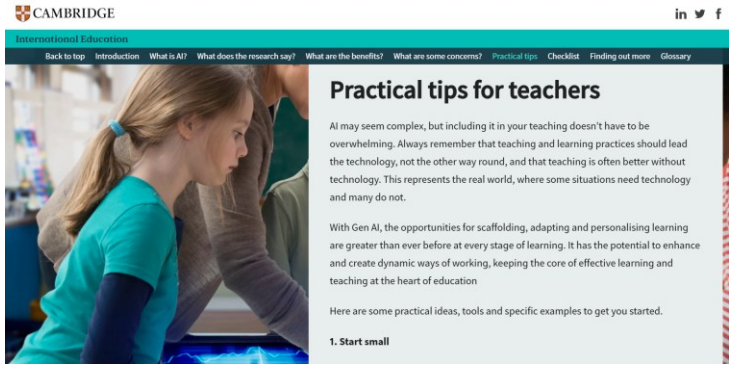
Getting started with AI in the classroom

- Introduces and develops key areas of teaching practice
- Links research to what happens in the classroom
- Includes practical ideas to help you get started
- Co-created with teachers across 3-19 pathway
- Updated with latest research & guidance





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Preparing learners to thrive in a changing world

cambridge.org/future-ready-learners

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Research into cognitive offloading

- Accessing information ≠ constructing knowledge

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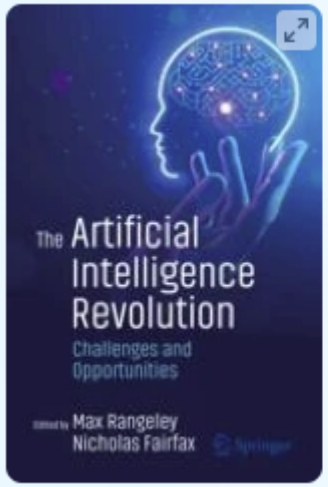
Cognitive offloading

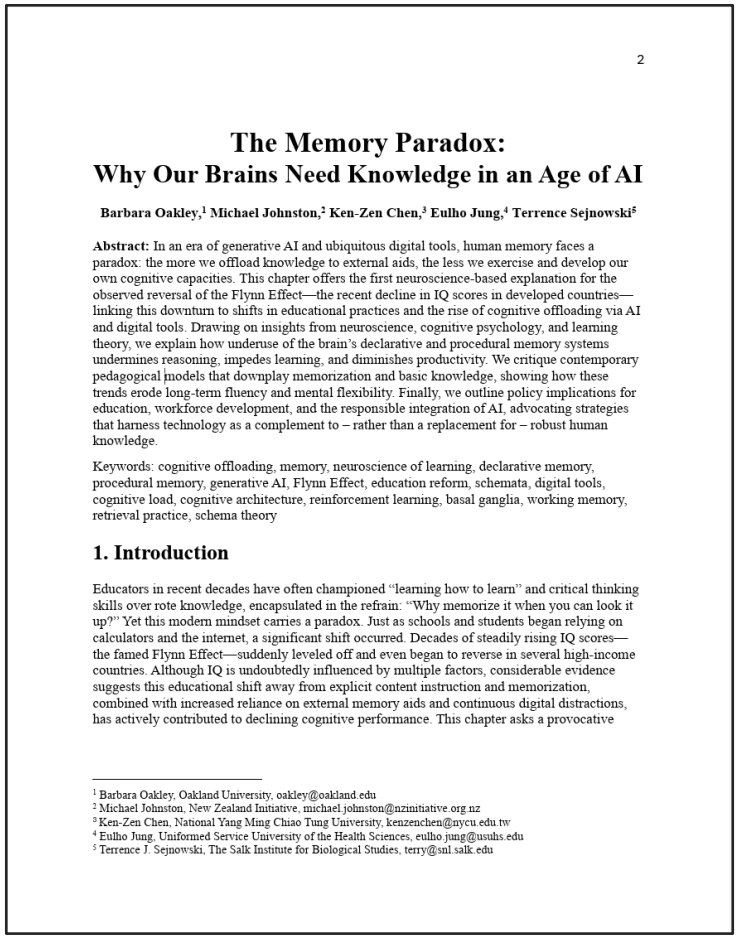
- Accessing information ≠ constructing knowledge



The Artificial Intelligence Revolution

Challenges and Opportunities

Book | May 2026



2

The Memory Paradox:
Why Our Brains Need Knowledge in an Age of AI

Barbara Oakley,[1] Michael Johnston,[2] Ken-Zen Chen,[3] Eulho Jung,[4] Terrence Sejnowski[5]

Abstract: In an era of generative AI and ubiquitous digital tools, human memory faces a paradox: the more we offload knowledge to external aids, the less we exercise and develop our own cognitive capacities. This chapter offers the first neuroscience-based explanation for the observed reversal of the Flynn Effect—the recent decline in IQ scores in developed countries—linking this downturn to shifts in educational practices and the rise of cognitive offloading via AI and digital tools. Drawing on insights from neuroscience, cognitive psychology, and learning theory, we explain how underuse of the brain's declarative and procedural memory systems undermines reasoning, impedes learning, and diminishes productivity. We critique contemporary pedagogical models that downplay memorization and basic knowledge, showing how these trends erode long-term fluency and mental flexibility. Finally, we outline policy implications for education, workforce development, and the responsible integration of AI, advocating strategies that harness technology as a complement to – rather than a replacement for – robust human knowledge.

Keywords: cognitive offloading, memory, neuroscience of learning, declarative memory, procedural memory, generative AI, Flynn Effect, education reform, schemata, digital tools, cognitive load, cognitive architecture, reinforcement learning, basal ganglia, working memory, retrieval practice, schema theory

1. Introduction

Educators in recent decades have often championed "learning how to learn" and critical thinking skills over rote knowledge, encapsulated in the refrain: "Why memorize it when you can look it up?" Yet this modern mindset carries a paradox. Just as schools and students began relying on calculators and the internet, a significant shift occurred. Decades of steadily rising IQ scores—the famed Flynn Effect—suddenly leveled off and even began to reverse in several high-income countries. Although IQ is undoubtedly influenced by multiple factors, considerable evidence suggests this educational shift away from explicit content instruction and memorization, combined with increased reliance on external memory aids and continuous digital distractions, has actively contributed to declining cognitive performance. This chapter asks a provocative

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[2] Michael Johnston, New Zealand Initiative, michael.johnston@nzinitiative.org.nz
[3] Ken-Zen Chen, National Yang Ming Chiao Tung University, kenzenchen@nycu.edu.tw
[4] Eulho Jung, Uniformed Service University of the Health Sciences, eulho.jung@usuhs.edu
[5] Terrence J. Sejnowski, The Salk Institute for Biological Studies, terry@snl.salk.edu

Oakley, B., Johnston, M., Chen, K.-Z., Jung, E., & Sejnowski, T. (2025). "The Memory Paradox: Why Our Brains Need Knowledge in an Age of AI." In The Artificial Intelligence Revolution: Challenges and Opportunities (Springer Nature, forthcoming).

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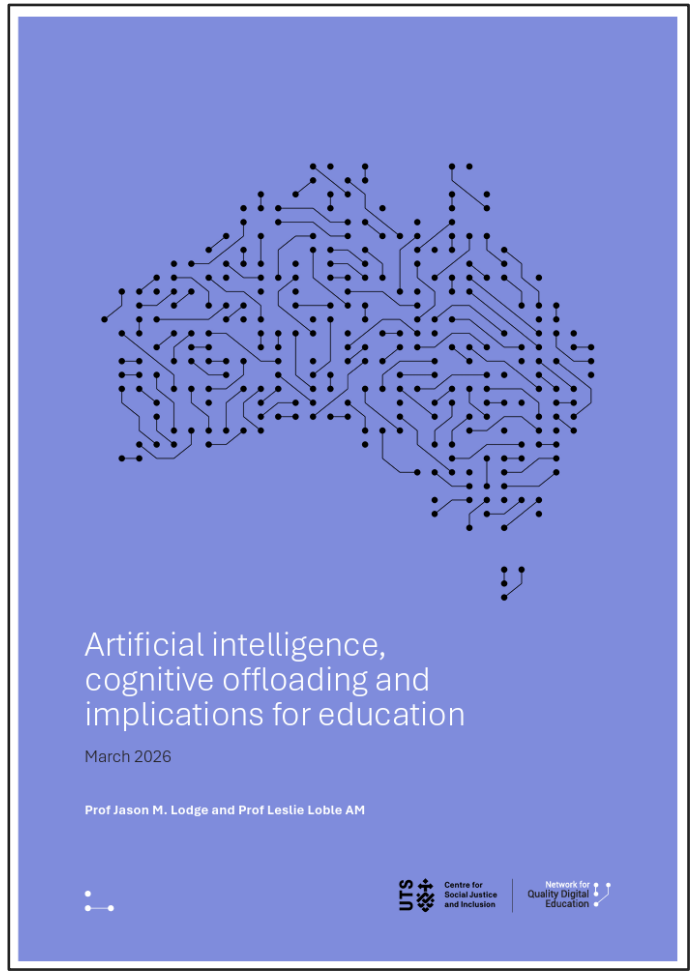
Cognitive offloading

- Accessing information ≠ constructing knowledge

"There is a growing body of evidence that using AI can short-circuit the cognitive effort required for sustainable, deep learning, creating 'false mastery' with potentially long-term consequences."



Lodge J. M. and Loble L (2026). *Artificial intelligence, cognitive offloading and implications for education*, University of Technology Sydney, doi:10.71741/4pyxmbnjaq.31302475.

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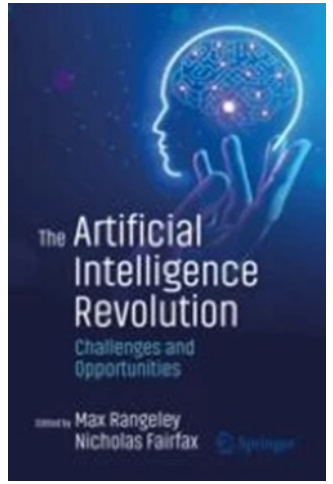

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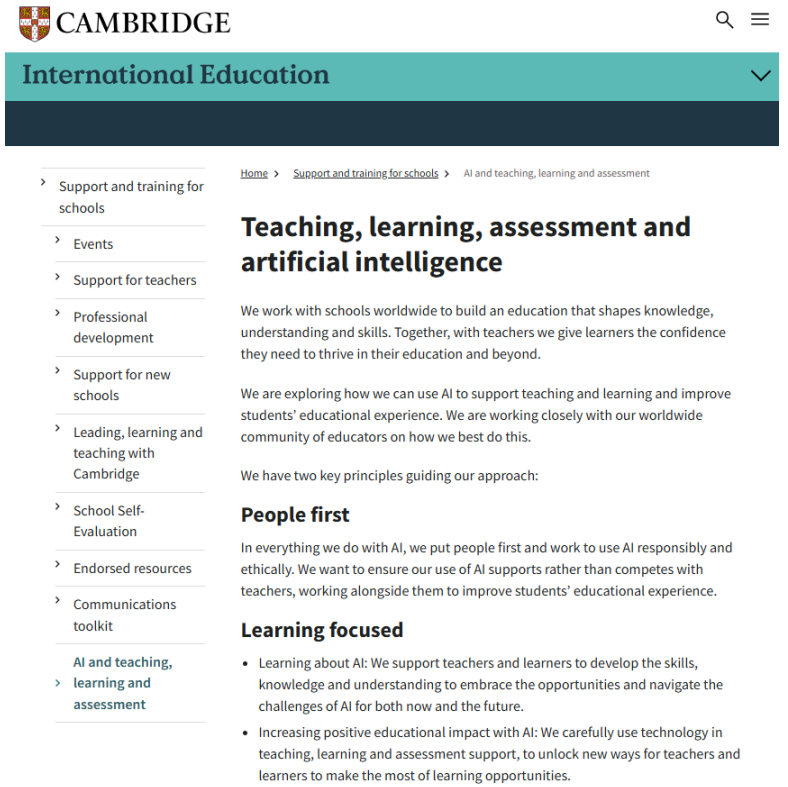
From research to responsible use

- Learners increasingly equate:
  - “I can generate an answer” with “I understand”



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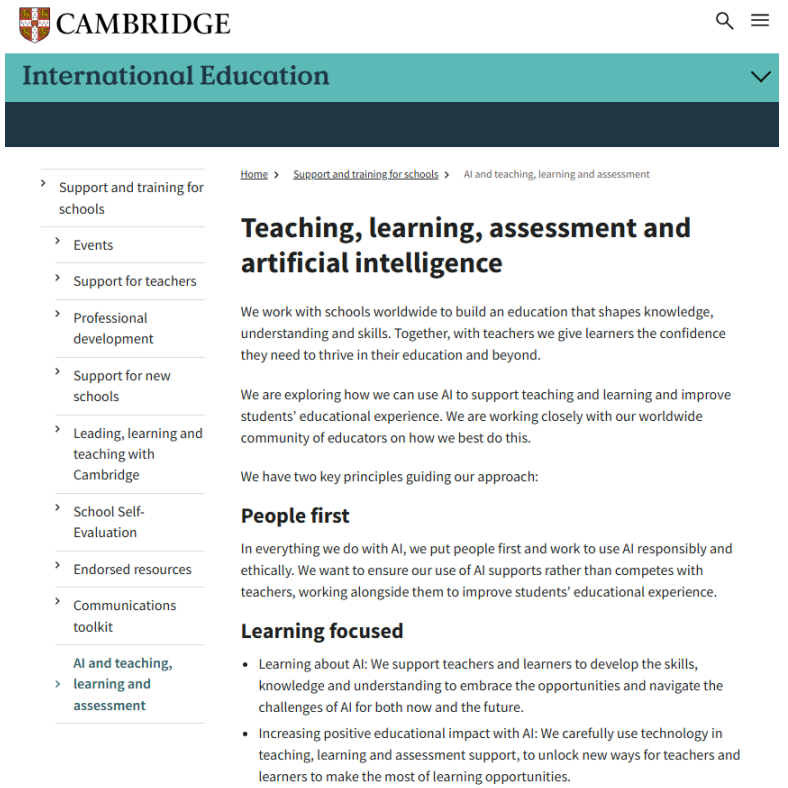
From research to responsible use

- Growing concern that AI can:
  - Bypass formative learning stages
  - Undermine core thinking skills if used indiscriminately

- We need to preserve:
  - Human judgement
  - Deliberate practice
  - Effortful learning alongside AI support



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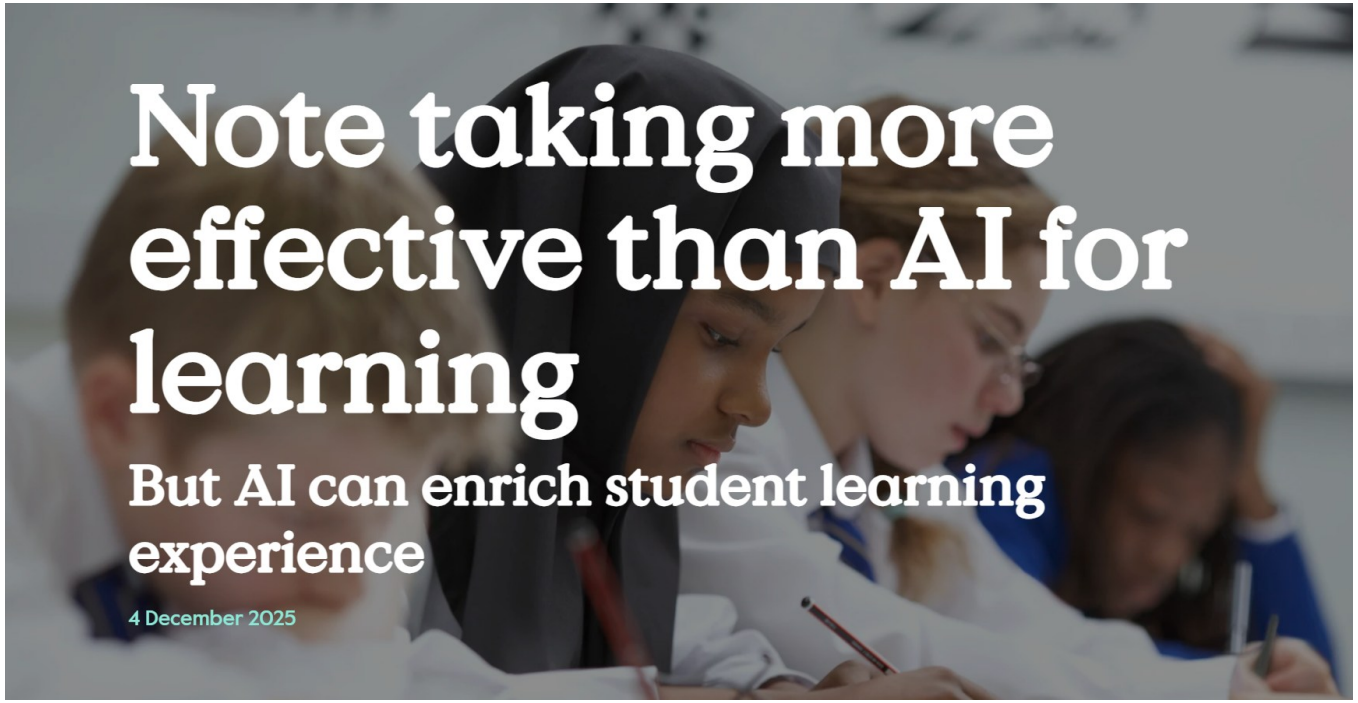
Cambridge research –Dec 2025

"Our study shows that students enjoyed using AI chatbots but note taking was more effective for learning outcomes."



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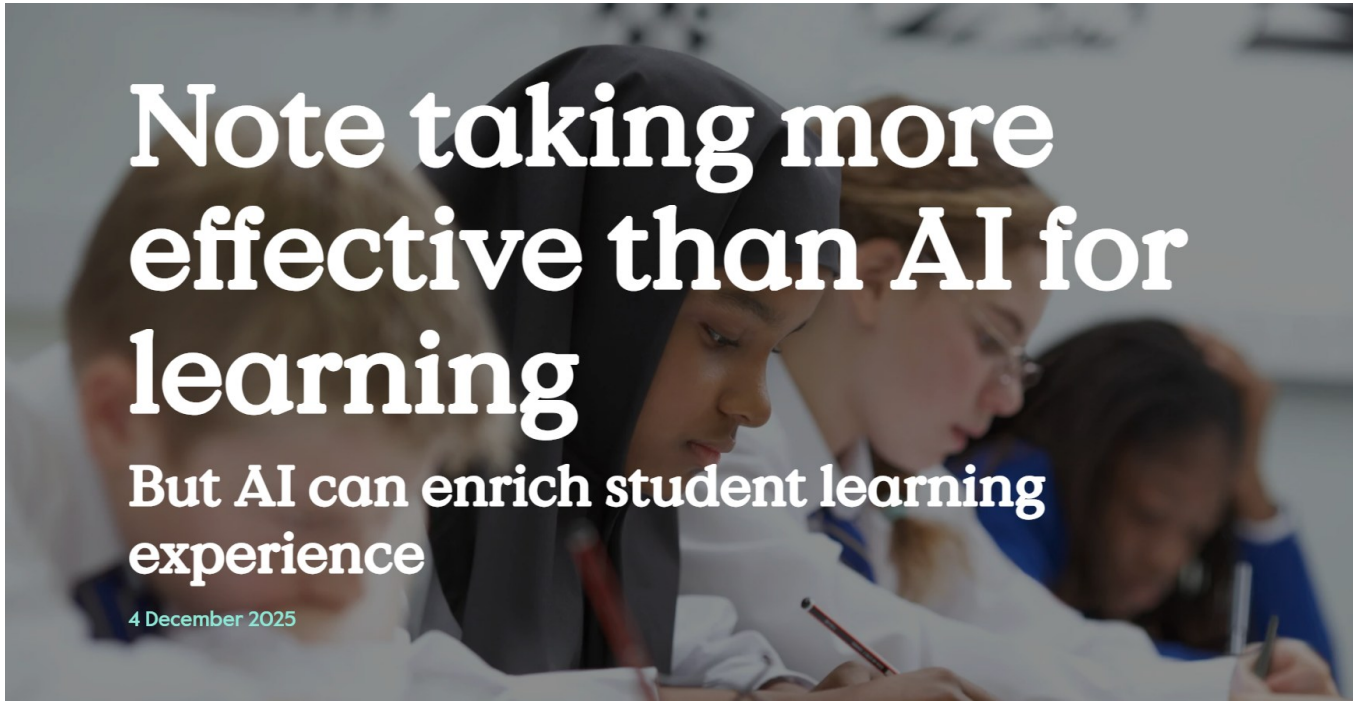

"Rather than viewing traditional learning techniques, like note taking, and newer generative-AI approaches as competing alternatives, we should view them as complementary."

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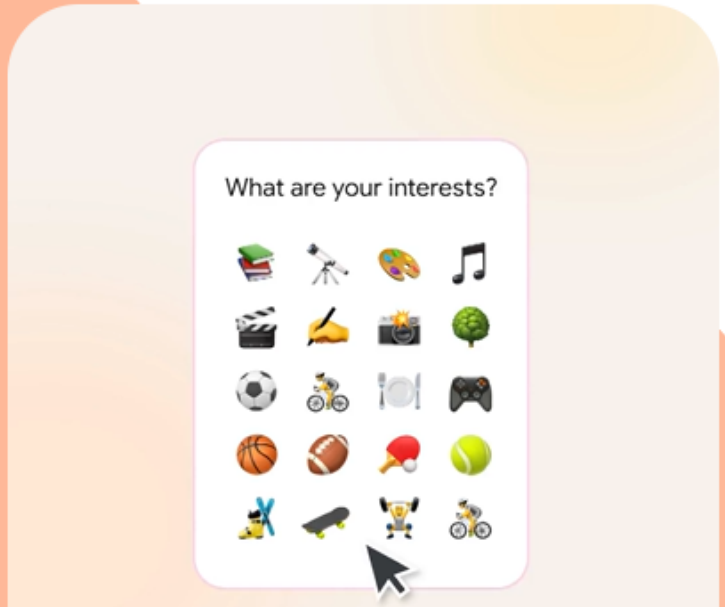

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Active use of AI in education - 2026

- There are so many examples of *potentially* great AI tools

Student feedback	Resource generation
Automated marking	Adaptive & personalised testing
Question generation	Learning analytics & insights

AI Startup Market Map:

Gen AI Use Cases in K-12 Education

AI Native Companies

Explore our market map featuring K-12 specific use cases for Generative AI in educational contexts.

Edtech Insiders

Instructional Materials

LESSON PLAN GENERATION

twee · learning genie · colleague.ai · LearningFlow.ai · almanack

MULTIMODAL INSTRUCTION (AUDIO/VIDEO/GAMES)

Steve AI · ROSEBUD AI · Curipod · MyLens AI · TINY TAP

STUDY MATERIAL GENERATION

Knowt · Vaia · algor · mindgrasp · Jungle

INSTRUCTIONAL CHATBOTS/INTERACTIVE EXPERIENCES

Codédex · CODECOMBAT · thunkable · CODEMONKEY · thinglink.

SPECIALIZED CLASSROOM ACTIVITY GENERATION

TeachMateAI · TEACHERMATIC · Teachflow · AIforL · DebaterHub

DEVELOPING ONLINE LEARNING

DISCO · Learning Studio AI · CourseAI · Mindsmith · MINDEDGE

ENGAGE STUDENTS WITH CELEBRITIES

HISTORY HELLO · rebind · Onlock Learning · ViXi · HISTORIC MENTOR

SUPPORT FOR ELL/MLL LEARNERS

CATHOVEN Language Hub · Speakable · BOOKR CLASS · Singil · Pace AI

PEDAGOGY-SPECIFIC APPROACHES

inkwire · EngageAI Institute · Teaching Tools · pathfinder · teachally

CULTURALLY RESPONSIVE CONTENT GENERATION

COMMONGOOD · Reconstruction

EXPLANATION GENERATION

sizzle · StepWise

EMERGING USE CASES

Connect New Concepts To Old

Extensions, Enrichment & Challenge

Assessment and Feedback

AI ASSISTED GRADING

cograder · ALL In Learning · AutoMark · EnlightenAI · graide

FEEDBACK ON (WRITTEN) STUDENT WORK

Teacher Professional Learning

RESEARCH FOR EVIDENCE-BASED PRACTICES

scite_ · scholarcy · genei · keenious

INSTRUCTIONAL COACHING

EDTHENA · TeachFX · LessonLoop · kindred · muyu

CLASSROOM MANAGEMENT SIMULATION

Mursion · RELAY/GSE · ACTS Simulator

Teacher Practice Support

TOOL SUITES FOR TEACHERS & STUDENTS

MAGIC SCHOOL · BRISK TEACHING · schoolai · codio · Flint

ANALYSIS OF STUDENT DATA

edia · Eedi · Schoolytics · Scout · doowii

ACADEMIC INTEGRITY

ZeroGPT · GPTZero · Honorlock · The Invigilator · Pangram

Social Tools

SMALL GROUP FACILITATION

BREAKOUT LEARNING · Human 2Human · OKO

PEER TUTORING

Kritik · college contact · Peer Teach

INTEREST-BASED GROUPS & NETWORKS

StudyStream · My Village · Solvably

CLASS DISCUSSION FACILITATION

harmonize · CoGuide

Student Support

EARLY READING COACH

Ello · Project Read · YUNA · Lexplore · Kibeam

WRITING ASSISTANCE

writefull · TRINKA · Quill · packback · WriteReader

MENTAL HEALTH & WELL-BEING

Woebot Health · koko · mainstay · sonar · EDSIGHTS

AI-ENHANCED TUTORING

SYNTHESIS · Acely · THINKSTER · Tutor AI · TutorOcean

SUPPORT FOR NEURODIVERGENCE & SPECIAL NEEDS

Speechify · Signapse · playground IEP · SLAIT · Lily Assist

LANGUAGE PRACTICE PARTNER

Talkpal AI · Speak · praktika.ai · ISSEN · Langotalk

LEARNING COMPANION

MIKO · Tolan · Buddy.ai · TutorEva · BusyBee

CAREER COACHING & EXPLORATION

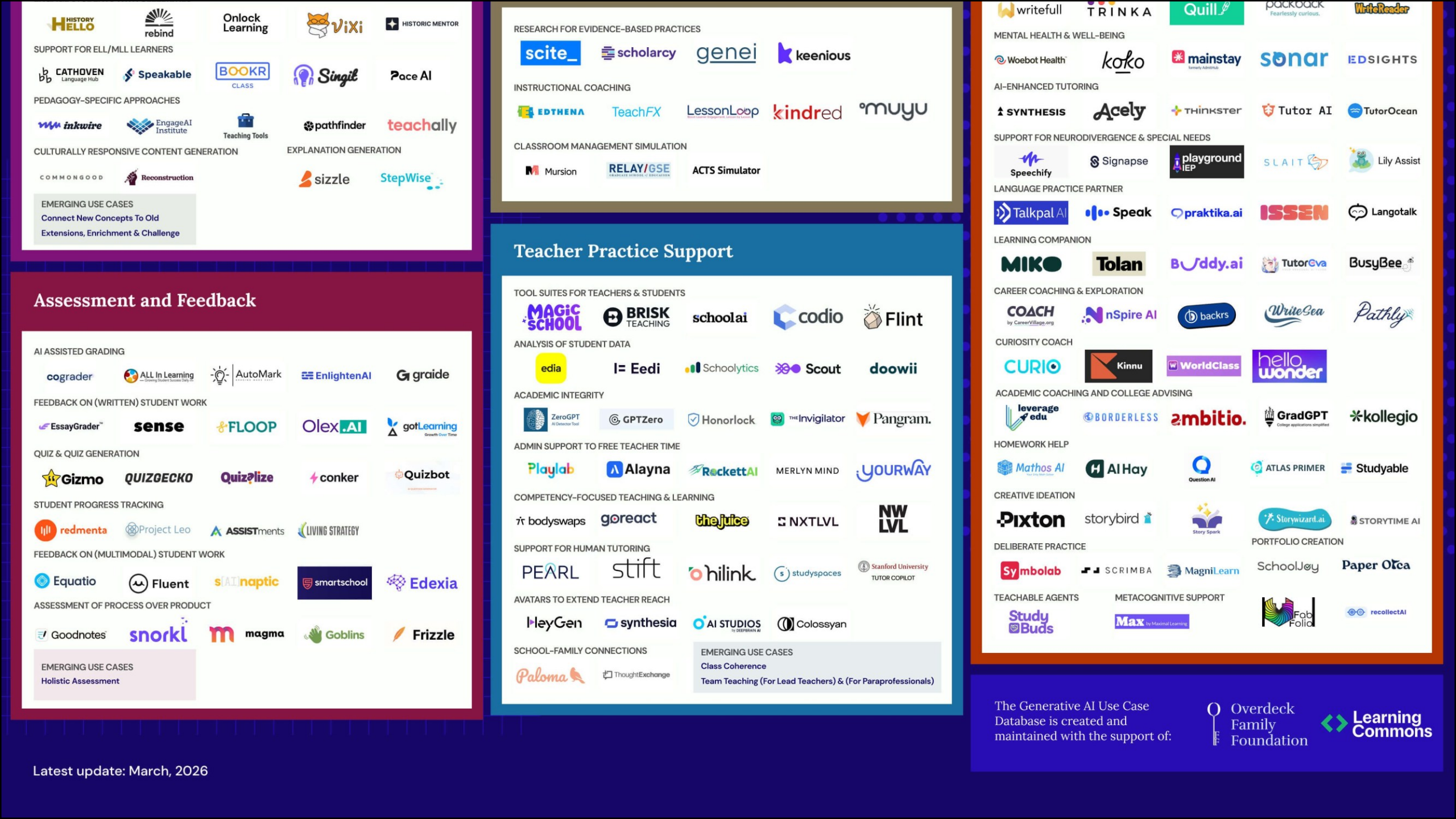
COACH · nSpire AI · backrs · WriteSea · Pathly

CURIOSITY COACH

CURIO · Kinnu · WorldClass · hello wonder

ACADEMIC COACHING AND COLLEGE ADVISING

leverage edu · BORDERLESS · ambitio. · GradGPT · kollegio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ADMIN SUPPORT TO FREE TEACHER TIME
COMPETENCY-FOCUSED TEACHING & LEARNING
SUPPORT FOR HUMAN TUTORING
AVATARS TO EXTEND TEACHER REACH
SCHOOL-FAMILY CONNECTIONS
EMERGING USE CASES
Class Coherence
Team Teaching (For Lead Teachers) & (For Paraprofessionals)
MENTAL HEALTH & WELL-BEING
AI-ENHANCED TUTORING
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DELIBERATE PRACTICE
PORTFOLIO CREATION
TEACHABLE AGENTS
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