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# Artificial Intelligence in education – friend or foe?

## Communicating Cambridge's Approach to Generative AI

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Sanjay Mistry – Head of Research for Digital Assessment & Evaluation

18th March 2024

**Cambridge Schools Conference, March 2024**
Effective communication: from competence to confidence

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# Education & AI

*Can We No Longer Believe Anything We See?* The New York Times

Australian universities to return to 'pen and paper' exams after students caught using AI to write essays The Guardian

Teacher assessment 'impossible' amid ChatGPT rise tes magazine

Education

AI Will Transform Teaching and Learning. Let's Get it Right Stanford University Human-Centered Artificial Intelligence

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# Contents slide

- Defining AI
- Understanding the impact of AI in assessment
- Cambridge’s response to AI in assessment
- Considering AI in Teaching & Learning
- AI considerations for schools

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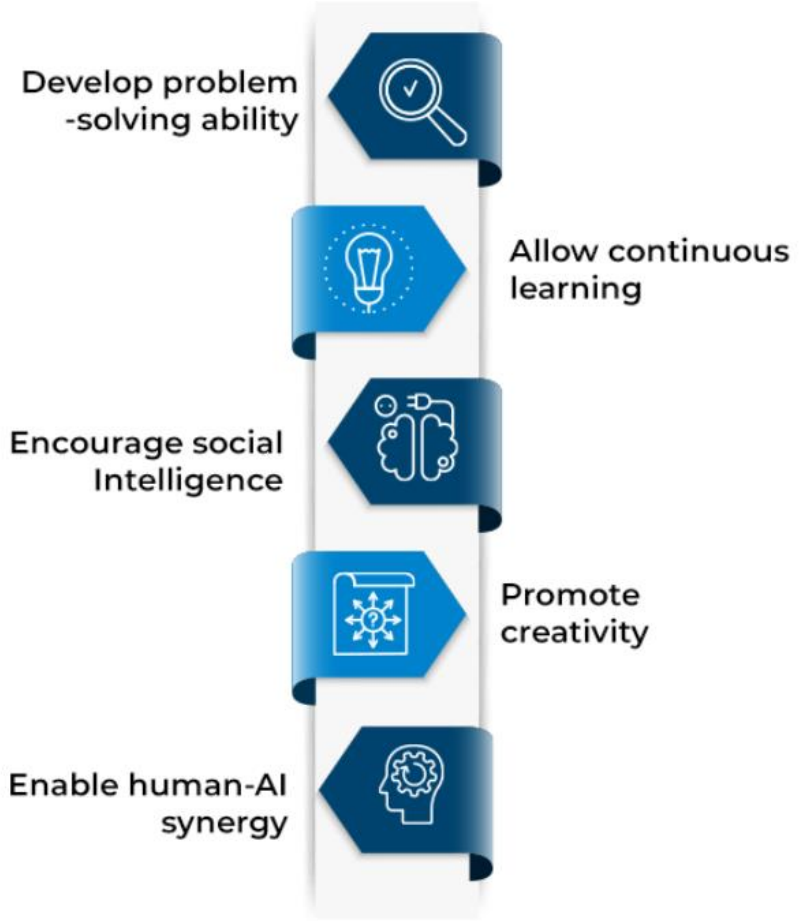
# Defining AI Uses & Purpose

- AI is primarily achieved by reverse-engineering human capabilities and traits
  - Then applying these to machines (i.e., computer programming)
- AI learns human behaviour to develop intelligent machines
  - Computer systems to work intelligently yet independently




Goals of Artificial Intelligence

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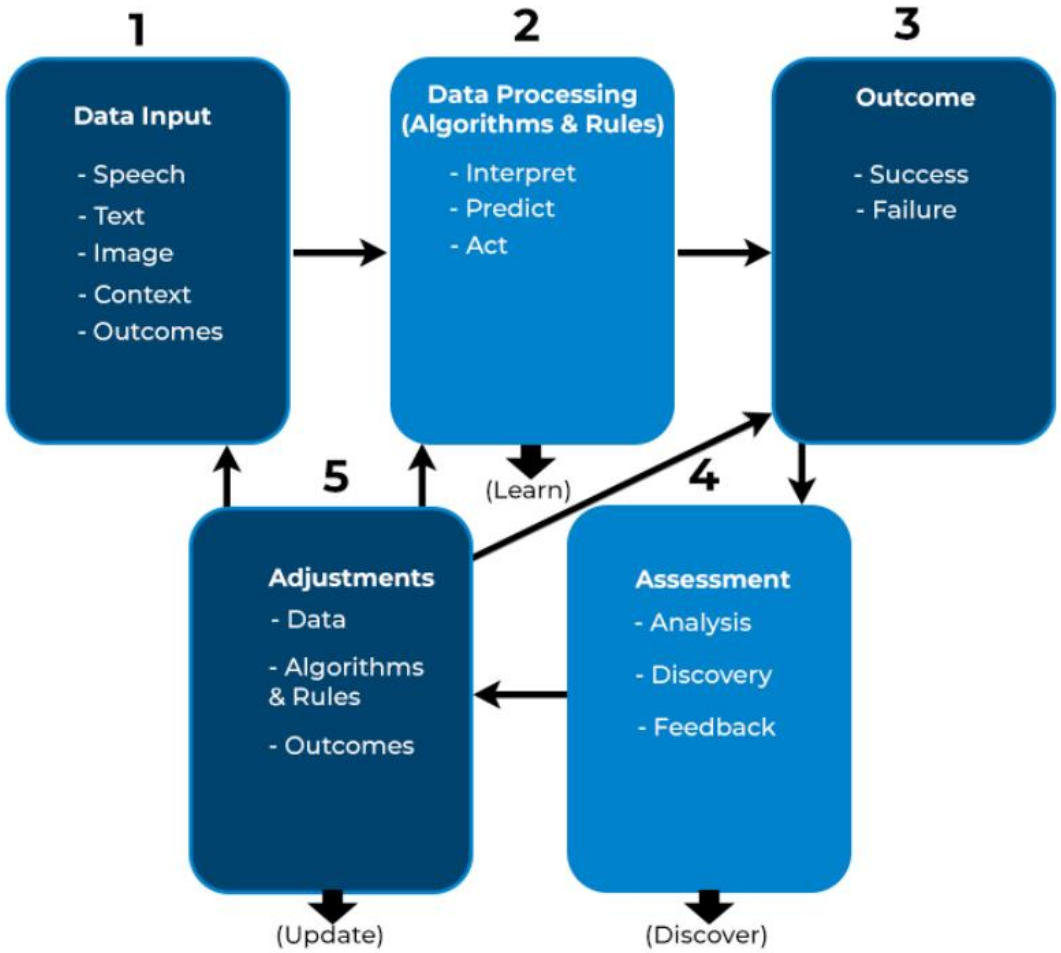
# How does AI work?

Let’s give it a try…

**How do you make a cup of tea?**

- Take 2 minutes to list in order all the steps you regularly use to make a cup of tea
- Be as specific as possible




How AI Works

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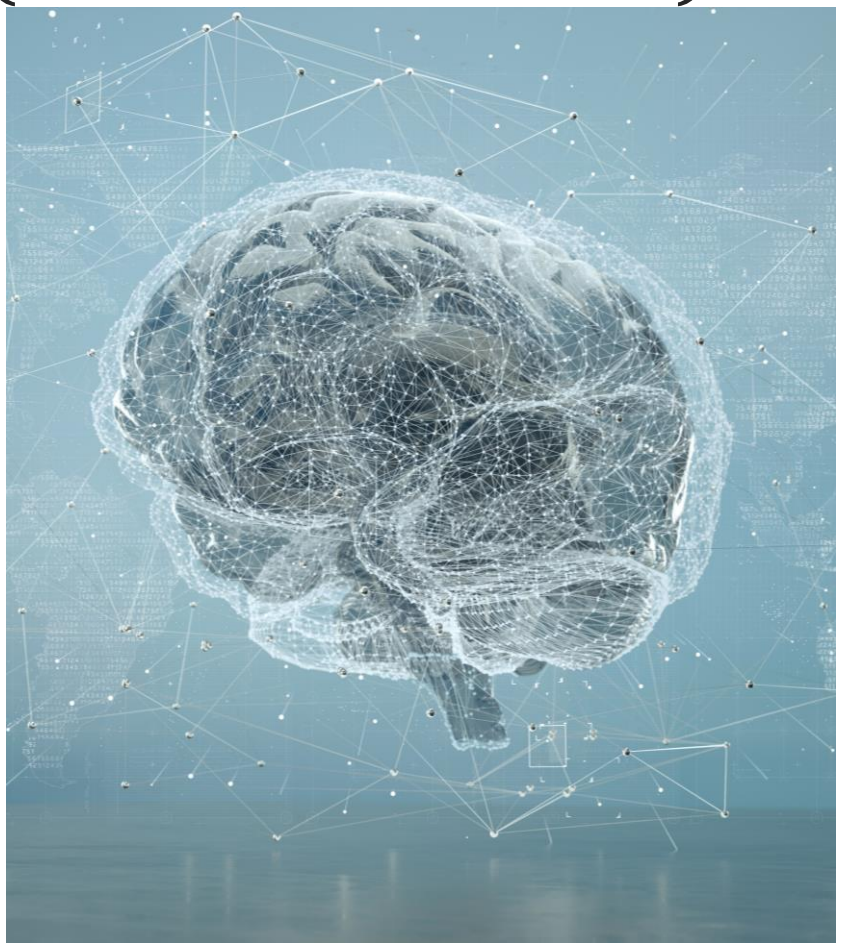
# Risks, issues with and concerns with AI use in Education (Discussion task)



**What do you see as the potential risks, issues and concerns of AI in Education?**

- Have you come across any risks or issues whilst using AI in the classroom?
- How have you and/or your school dealt with them?
- What concerns do you have for the future?

Discuss within the chat.

(**5 mins** discussion time and **5 mins** feedback)

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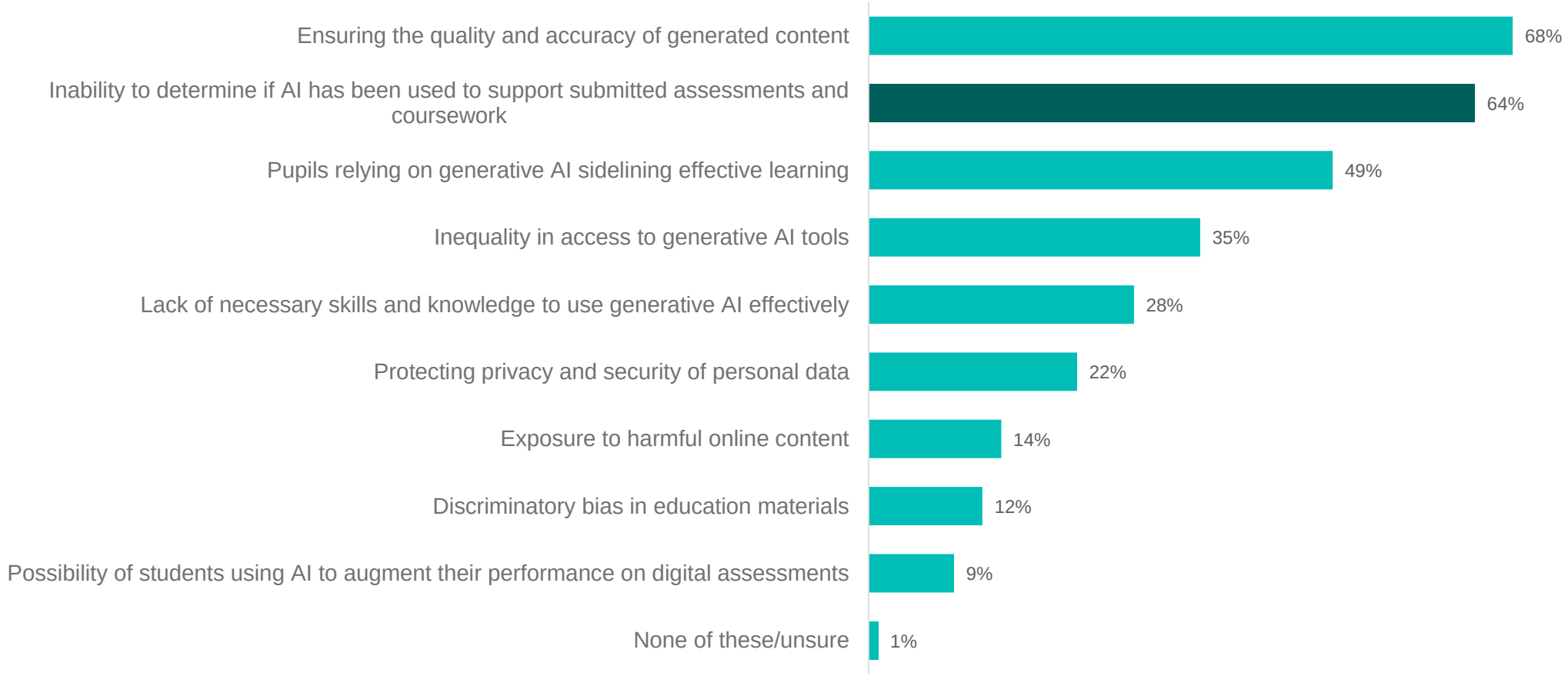
# What challenges have our schools identified?



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Researching all the way around the concept

# Understanding the Impact on Assessment

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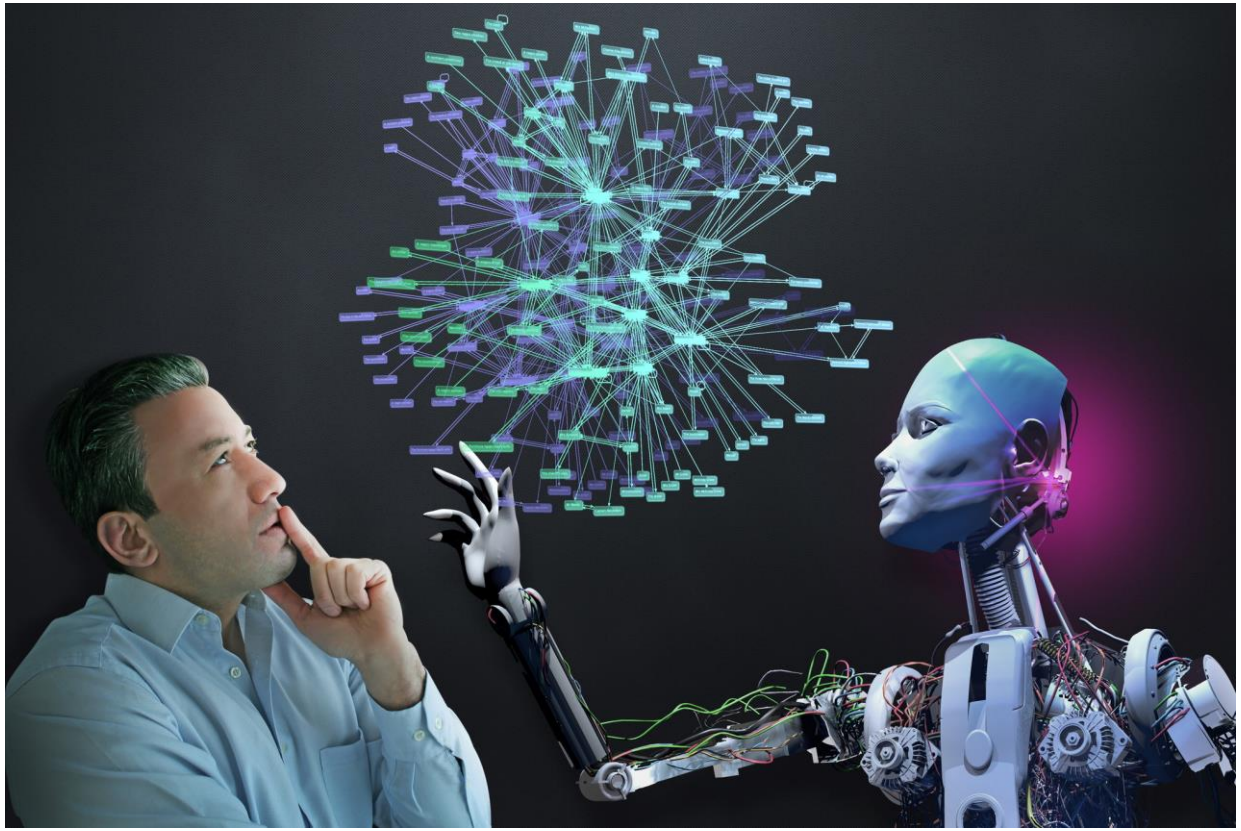
# How would students use AI on a Cambridge assessment?

- Pilot Study - Writing Essays Using AI

How do students engage with ChatGPT technology in assessment context?



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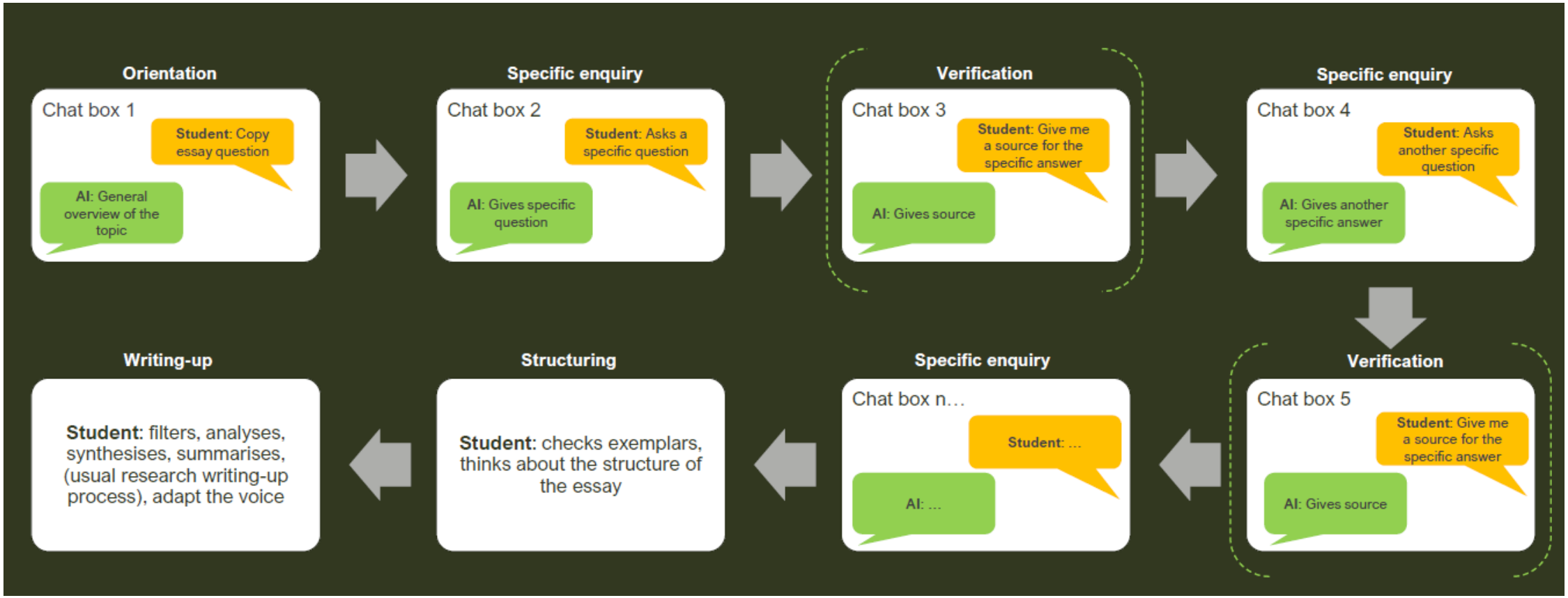
# How the students used AI




Orientation

Enquiry

Verification

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# Deepfakes and spurious sources

Maltby, J., Day, L., & McCutcheon, L. E. (2006). Celebrity Worship and Its Relation to Mental Health: A Longitudinal Study. Journal of Social and Clinical Psychology, 25(3), 327–357. https://doi.org/10.1521/jscp.2006.25.3.327

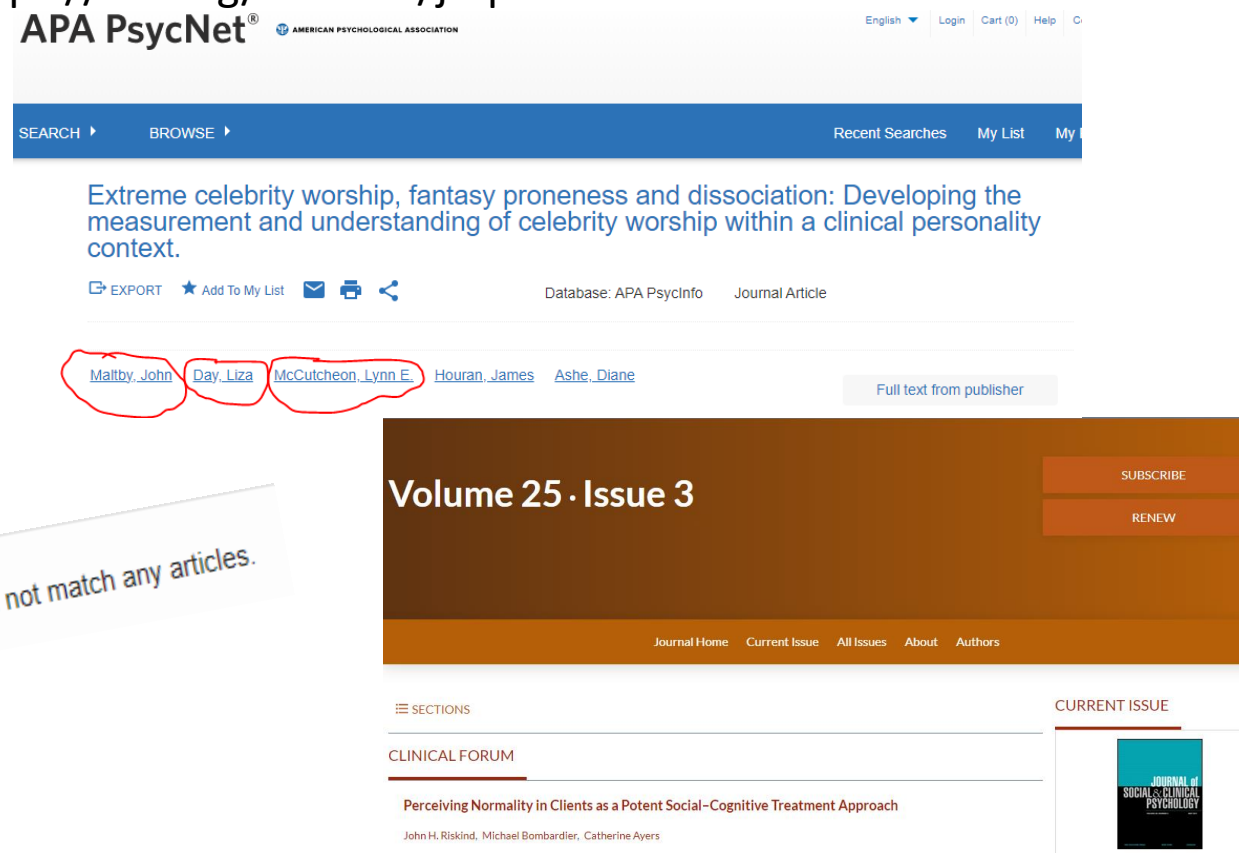
**DOI NOT FOUND**

**10.1521/jscp.2006.25.3.327**

This DOI cannot be found in the DOI System. Possible reasons are:

- The DOI is incorrect in your source. Search for the item by name, title, or other metadata using a search engine.
- The DOI was copied incorrectly. Check to see that the string includes all the characters before and after the slash and no sentence punctuation marks.
- The DOI has not been activated yet. Please try again later, and report the problem if the error continues.

Your search - **"Celebrity Worship and Its Relation to Mental Health: A Longitudinal Study"** - did not match any articles.



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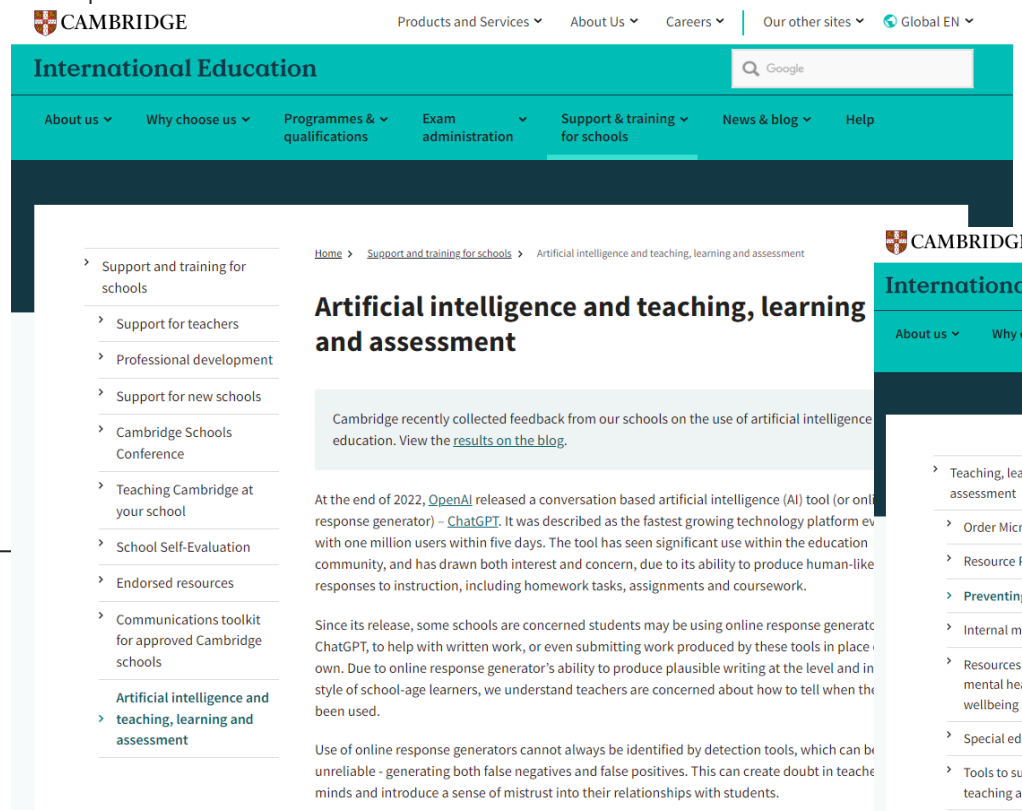
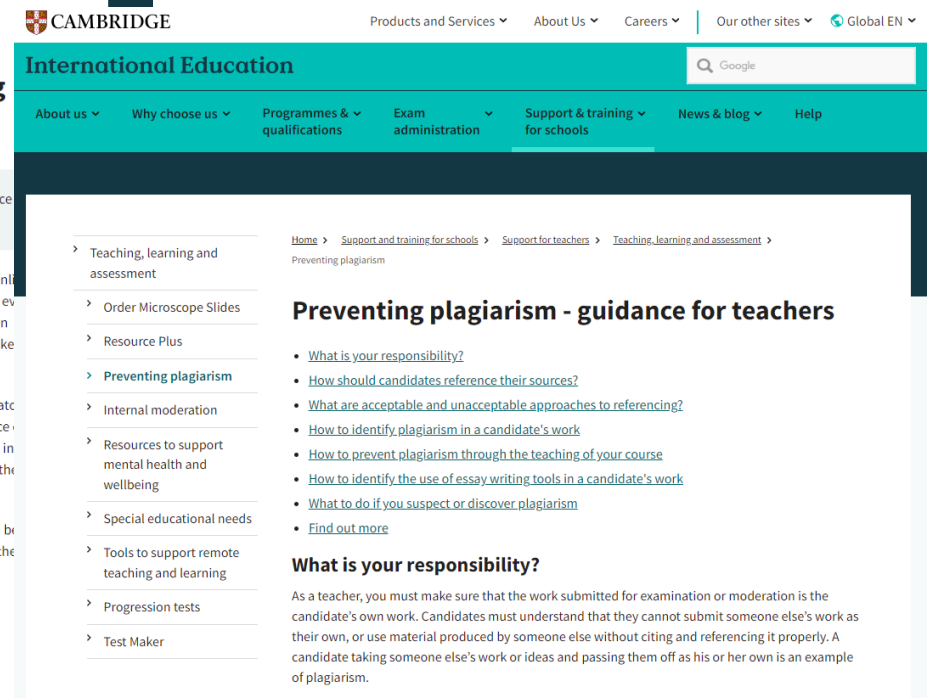
# The Cambridge response

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# How is Cambridge considering these findings?

Updated policy considerations:

- The following uses of generative AI programs by students in the preparation of material for submission as coursework are acceptable if clearly acknowledged in the work:
  1. To carry out initial research into a topic in preparation for a written study. This is no different from browsing in a search engine and citing websites visited in the bibliography. Candidates should cite clearly the prompt or series of prompts they used.
  2. To quote briefly from AI generated text within an essay and engage in critical discussion of the quotation. Quotations must be clearly acknowledged and identified within the candidate's writing, and like any other source of evidence should be contextualised and reviewed.
- Revised policy on **The use of generative AI in coursework from November 2023**

AI policies for Live Exam Series

- Any digital assessments will have a locked-down platform

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# Applications for Developing Assessment Content

- Using AI to develop test items
  - Grounded Large Language Model
  - LLMs can be used to generate anomalous responses (e.g., off-topic, tangential responses) to resolve the problem of data deficiency in automarker training and evaluation. For example, exemplary off-topic responses or responses containing abusive language is hard to find in real data but can be generated by LLMs.
  - Using LLMs to create anomalous responses in automarker training and evaluation
- Hackathons to develop MCQ distractors
- Two team projects focussed on content generation for IGCSE Multiple Choice Biology Questions
  - Using ChatGPT to generate questions then reviewing accuracy
  - Item writers will feed into the development of an item writing assistant, which will then produce items and compare to items created using manual process

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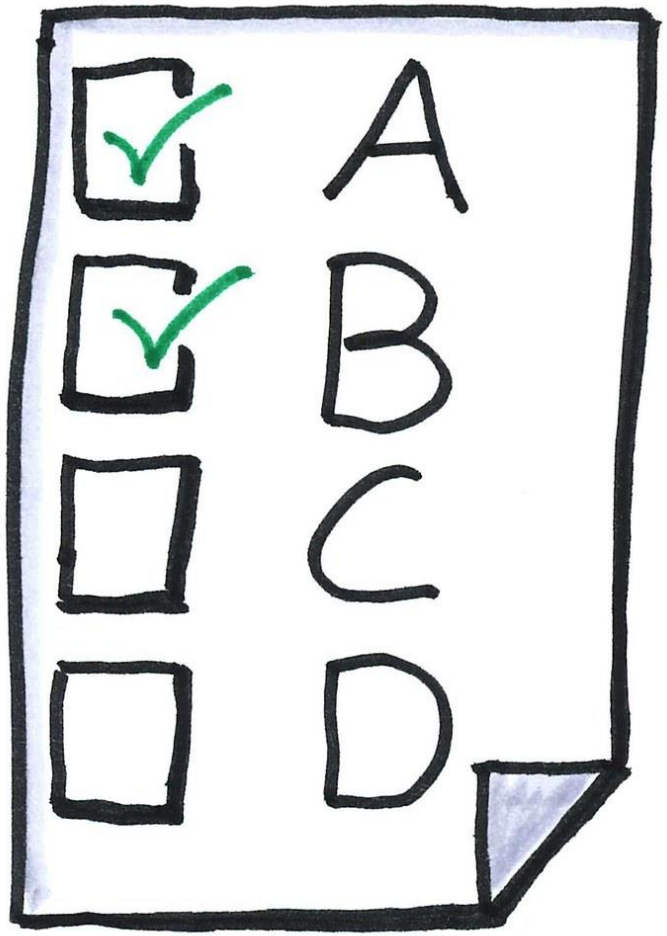
# Using AI for Scoring

- Researching how AI can be used to score our assessments
  - Short answers
  - Automated essay scoring (AES)
- Using the Mock Service responses to train a grounded LLM
- Proof of concept of evaluating an AI Automarker in terms of accuracy for the marking of longer response question types with the potential for using within the mock service



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It’s still learning and teaching…

# Understanding the Impact on Teaching & Learning

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# Uses of AI in the classroom

- Question generation
- Mark scheme creation
- Response checking
- Drafting tool
- Resource creation
- Formative feedback
- Support for revision
- Planning & preparation

Assigning AI: Seven Approaches for Students, with Prompts
(Mollick and Mollick, 2023)

# Seven Approaches...

| AI USE | ROLE | PEDAGOGICAL BENEFIT | PEDAGOGICAL RISK |
|---|---|---|---|
| **MENTOR** | Providing feedback | Frequent feedback improves learning outcomes, even if all advice is not taken. | Not critically examining feedback, which may contain errors. |
| **TUTOR** | Direct instruction | Personalized direct instruction is very effective. | Uneven knowledge base of AI. Serious confabulation risks. |
| **COACH** | Prompt metacognition | Opportunities for reflection and regulation, which improve learning outcomes. | Tone or style of coaching may not match student. Risks of incorrect advice. |
| **TEAMMATE** | Increase team performance | Provide alternate viewpoints, help learning teams function better. | Confabulation and errors. "Personality" conflicts with other team members. |
| **STUDENT** | Receive explanations | Teaching others is a powerful learning technique. | Confabulation and argumentation may derail the benefits of teaching. |
| **SIMULATOR** | Deliberate practice | Practicing and applying knowledge aids transfer. | Inappropriate fidelity. |
| **TOOL** | Accomplish tasks | Helps students accomplish more within the same time frame. | Outsourcing thinking, rather than work. |

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# Importance of the teacher

- Existing skills & expectations
- Academic rigour
- Source analysis
- Reliability, bias
- Critical and creative thinking skills
- Cambridge Global Perspectives

Our children need to be equipped for the dystopian brave new world

DAVID DE CARVALHO

## ‘We don’t need no education’: schooling in the age of AI

My mother is about to turn 90. She has just successfully completed two short online courses in Chinese history through HarvardX (and has emailed copies of the certificates to her six children).

What motivated her? She didn’t need it for her career. It was completely disconnected with any practical or financial concerns. So was it for pleasure? No, because she could have just continued to enjoy the various history documentaries she watches and books she reads. “It was very difficult.”

So why did she put herself through it?

“Because I wanted to keep my mind active and needed to be sure that what I was learning was true, based on the knowledge of the academic experts who chose the readings and ran the course, not just opinion and propaganda.”

In other words, she was driven by what Canadian Jesuit philosopher Bernard Lonergan has described as “the eros of the human spirit, our pure and unrestricted desire to know”.

While academic expertise and opinion and propaganda are not always and everywhere mutually exclusive – the boundary between evidence and ideology is sometimes more porous than we would like to imagine – my mother needed to be confident that she would finish the course with correct understanding, and this confidence would flow from it being measured against an external standard set by authoritative specialists.

It goes without saying that she did not use ChatGPT to help her write any of her assignments. There was no reason for her to plagiarise its output in any way. To have done so would have completely undermined her intrinsic motivation, namely deepening her own understanding.

But for school or university students, the situation is not so straightforward. For most, maybe most of them the award of the credential is a more powerful, extrinsic motive, more important than the underlying understanding for which it purports to provide evidence. That is a function of the way our education system has evolved into an instrument at the service of the economy, a sorting mechanism and a tool for training that prepares people for work.

If cheating using artificial intelligence improves one’s chances of gaining the credential but reduces the actual depths of understanding, then many may make the calculation that the credential is more important and act accordingly.

But there are much bigger problems. First, in the age of AI, what employment opportunities will there be for these graduates once they gain these credentials? Many of the jobs in the so-called knowledge economy will be done much more effectively and cheaply by AI systems. All those people studying and working in data analytics across multiple industry sectors should be worried.

When Geoffrey Hinton quit his job at Google last month, he said many of these jobs would disappear overnight. On cue, the share price for tech giant Chegg, which produces homework study guides in the US, plummeted by 50 per cent overnight due to fears about competition from ChatGPT. What happens to Chegg’s “knowledge workers”?

Perhaps even more worrying, Hinton said he was concerned that developments in artificial intelligence – with its ability to produce “deep fakes”, meant we were entering a world in which we would “not be able to know what’s true any more”, a concern recently echoed by Australia’s Human Rights Commissioner, Lorraine Finlay.

So the ChatGPT phenomenon, in addition to raising questions of academic integrity, is raising important questions about how we govern technological change, about how we warrant the accuracy and reliability of sources of information, about the nature of truth and knowledge, about humanity’s self-perception as the smartest species on planet.

> Feudal power-wielders were … more alive to the printing press’s social, economic, cultural, religious, scientific and political significance than we appear to be … to the impact of AI

And so it also raises questions about the wider purposes of education – the why, not just the what (curriculum) or the how (pedagogy). What are these wider purposes?

The earliest known curriculum document was a two-word inscription on the Temple of Apollo at Delphi in Greece. It read simply “Know yourself”. Knowing yourself and examining one’s life in a systematic and fundamentally honest way, so as to become wise, this is the most profound outcome of a successful education.

You won’t find the answer to that on ChatGPT.

Once called “character education”, this notion tended to carry the sense of compliance with a set of extrinsic and perhaps socially shaped behaviours. But developing in our students a commitment to thoughtful, honest, purposeful human agency, respectful of others and embracing the common concerns of one’s communities, this is indeed the wider objective of those who call themselves educators: to help young people come to know themselves and the power they have to change the world.

It used to be that to describe someone as educated meant that a person’s innate talents, interests and desires had been cultivated, enhanced, refined, deepened, broadened and developed with the help of elders and experts in a variety of disciplines who understood that learning was as much about attitudes as aptitudes. Now the term education connotes in the popular mind something much thinner – a process of acquiring skills and knowledge that will make us employable.

But if AI is going to do our jobs so much more cheaply and effectively, what does that mean for the way we think about education’s purpose? Perhaps we need to return to that earlier meaning of being educated – the meaning embodied by my mother’s efforts – because the more utilitarian rationale is being seriously undermined in the age of AI.

The problem with many of the current conversations about AI and education is that they tend to focus on questions like how can we ensure academic integrity and how can we use AI in the classroom to improve student learning.

While these are perfectly reasonable and important questions to ask, they are bounded by a very short time-horizon, and they frame AI as simply the latest in a long list of technologies – like paper replacing slate and calculators replacing logarithm books – that can be integrated across time into the existing paradigm of schooling and its employment-related purpose.

It’s akin to asking: “How do we harness this powerful new stallion to our existing educational buggy?” A better way to consider the situation is: “How do we surf this tsunami?” But to put the issue into sharper focus, it’s arguably more akin to the passengers on the Titanic asking: “Shall we put the deckchairs here or there?”

AI is an iceberg that is going to sink the current schooling paradigm because it is disrupting the society for which schooling is supposed to prepare our children.

Many, if not most, of us are not noticing – à la the boiled frog – or we are willing to ignore AI’s wider impact because of the personal conveniences it affords us. The change that AI is most like is the invention of the printing press. The medieval church did not rejoice in the democratising of knowledge that it allowed. It didn’t delight in the fact the monks would no longer need to sit at their desks all day transcribing the ancient texts that represented centuries of traditional and fixed knowledge over which the church exercised a monopoly.

The feudal power-wielders were very much alive to the fact knowledge was power, much more alive to the printing press’s social, economic, cultural, religious, scientific and political significance than we appear to be when it comes to the impact of AI.

Where the analogy breaks down is that, with AI, this technology is reversing the democratising dynamic of the printing press.

It is being driven by a very small number of global mega-corporations that are sucking up the personal data we are handing to them on a plate and selling our increasingly shortened attention spans via their worldwide network platforms. Those companies are racing one another for AI dominance and leaving governments and regulatory agencies well behind them. Their commercial motives are not aligned with the interests of democracy, which relies on open debate and free exchange of ideas about factual situations.

The global network platforms are designed to give us more of what we want – feeding our own biases and prejudices – not what we need objective, reliable facts.

So what is the new paradigm of education that will ensure that the economic, social and cultural disruption being caused by AI serves humanity rather than enslaves it?

During the next 18 months education ministers will consider a new version of the National School Reform Agreement, which aims to give effect to the Alice Springs (Mparntwe) Education Declaration signed in December 2019.

That statement says our education system should promote both excellence and equity, and that it should produce young people who are “successful lifelong learners, confident and creative individuals, and active and informed members of the community”.

Right now there is a particular need to focus on the third of these: active and informed citizens. This is because of the irony that despite advances in technology such as ChatGPT giving us access to more information than ever, this access has not ushered in a new Age of Enlightenment.

Rather, as Tom Nichols has written in his 2017 book The Death of Expertise, it has “helped fuel a surge in narcissistic and misguided anti-intellectual egalitarianism that has crippled the possibility of informal reasoned debate on all manner of public issues”.

Building on the epistemic relativism encouraged by postmodernism, our age is one in which all opinions are equally valid, and the internet will provide us all with whatever “alternative facts” we need to give our prejudices the veneer of rationality.

There are so many “facts” at our disposal, we feel free just to choose the ones that fit our prejudices, and not bother with asking the question as to what, ultimately is true and good.

While postmodernism has led to many important insights about power and ideology, a damaging aspect of its legacy has been the undermining of the importance of factual truth and cultural reference points. The undermining of the solid ground of reality on which individuals can base their own solid sense of self and community and of their own agency in a world that is knowable, a world in which things can be true or false, represents a serious threat to our democratic society.

It also represents a threat to people’s mental health as they confront a world of meaninglessness and find themselves standing on the edge of a bottomless abyss of relativity.

This existential threat to our sense of personal and autonomy and agency is under threat when more and more decisions that affect our lives are being made by machines.

So schooling, while preparing our children as best it can for the changing world of work, is going to need to focus more on those aspects of humanity that are exclusively human and vitally important for our development as democratic communities.

In addition to reading, writing, numeracy and digital literacy, the other four general capabilities in the Australian Curriculum – ethical understanding, personal and social capability, intercultural understanding, and critical and creative thinking, are going to be more and more important.

But this focus cannot come at the expense of factual knowledge and an emphasis on truth. Rather, it has to come through the teaching of a knowledge-rich curriculum, taught by teachers whose social and cultural role as authoritative sources of information, knowledge and wisdom needs urgent buttressing. Our children are inheriting a dystopian brave new world and need to be equipped for the knowledge, capabilities and attitudes needed to renew and rehumanise that world. How we convert that purpose of schooling into concrete action is the challenge for all of us.

In a few weekends, four generations of my family will celebrate my mother’s 90 years of life, an occasion for reflection as well as for joy. Of her many virtues, perhaps the one I will celebrate the most is her unquenchable curiosity about important things. The desire and ability to keep asking the big questions about life is what defines us as human beings. We need to ensure our schooling system keeps fanning the flames of our very human wonder.

*David de Carvalho is chief executive of the Australian Curriculum, Assessment and Reporting Authority.*

THE AUSTRALIAN

Friday, June 16, 2023

**Cambridge Schools Conference, March 2024**

Effective communication: from competence to confidence

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# Huge opportunities with AI – more than a tool?


Generative AI in Photoshop



AI content generation

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# Appropriate use

- Positive, impactful uses of AI
- Making use of existing Cambridge guidance
- Command words
- Foster higher-order thinking and deeper levels of understanding
- Evidence of understanding
- Contextualisation
- Reward positive use

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# Feedback

- What did you do ‘before AI’?
- Impact of effective feedback
- How might you make use of AI to support your practice?
- Not AI automation and replacing teachers
- Enhancing existing techniques
- Formative feedback opportunities

Cambridge Assessment International Education

## Assessment for learning

Assessment for learning (AfL) is an approach, integrated into teaching and learning, which creates feedback for students and teachers in order to improve learning and guide their next steps.

### What does assessment for learning mean?

AfL focuses on **both the teacher and student** understanding three key things:

1. **Where the learner is going.** Sharing the aims of a lesson and success criteria helps learners to see what they are aiming for and what they need to do to achieve those aims.

2. **Where the learner is now.** Techniques such as effective questioning will help teachers to gauge what individuals and groups have learnt during a lesson, generating evidence of learning that both teacher and students can make use of.

3. **How can the learner get there?** Teachers use this evidence of learning to inform choices about what they will do next with a class or individual students. Learners can use this evidence to make decisions about their learning, such as how to spend their independent study time.


AfL is concerned with maximising the feedback process (teacher to student and student to teacher) to optimise student learning. Feedback ranges from the **informal** (e.g. oral comments given immediately to learners as they think through problems), to more **formal** (e.g. written feedback given after an end-of-topic test). AfL also involves high-quality **peer and self-assessment** where learners or peers may be involved in making decisions about future learning needs (Wiliam, 2018).

The term 'assessment for learning' became popular in the 1990s. At this time there was concern that learners were being over-assessed and that there was a disproportionate focus on end results (assessment of learning) rather than on assessment processes that could actively enable learners to make progress. Both assessment for learning and assessment of learning are valuable in education, but they have different purposes.

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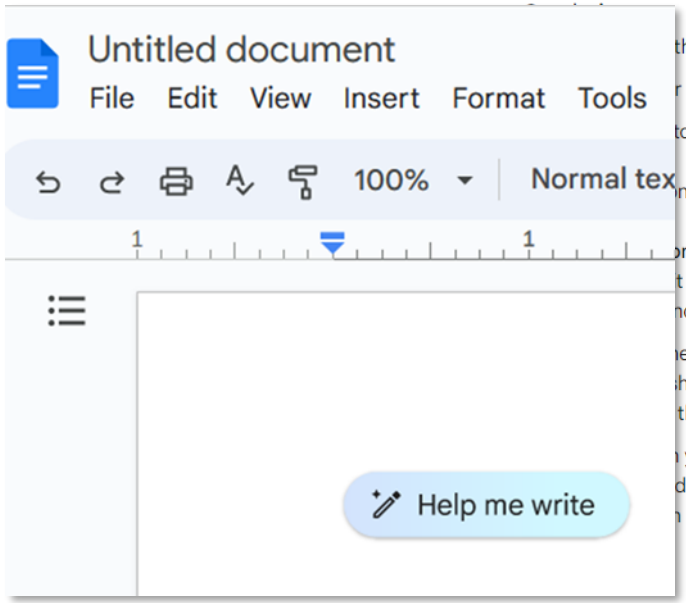
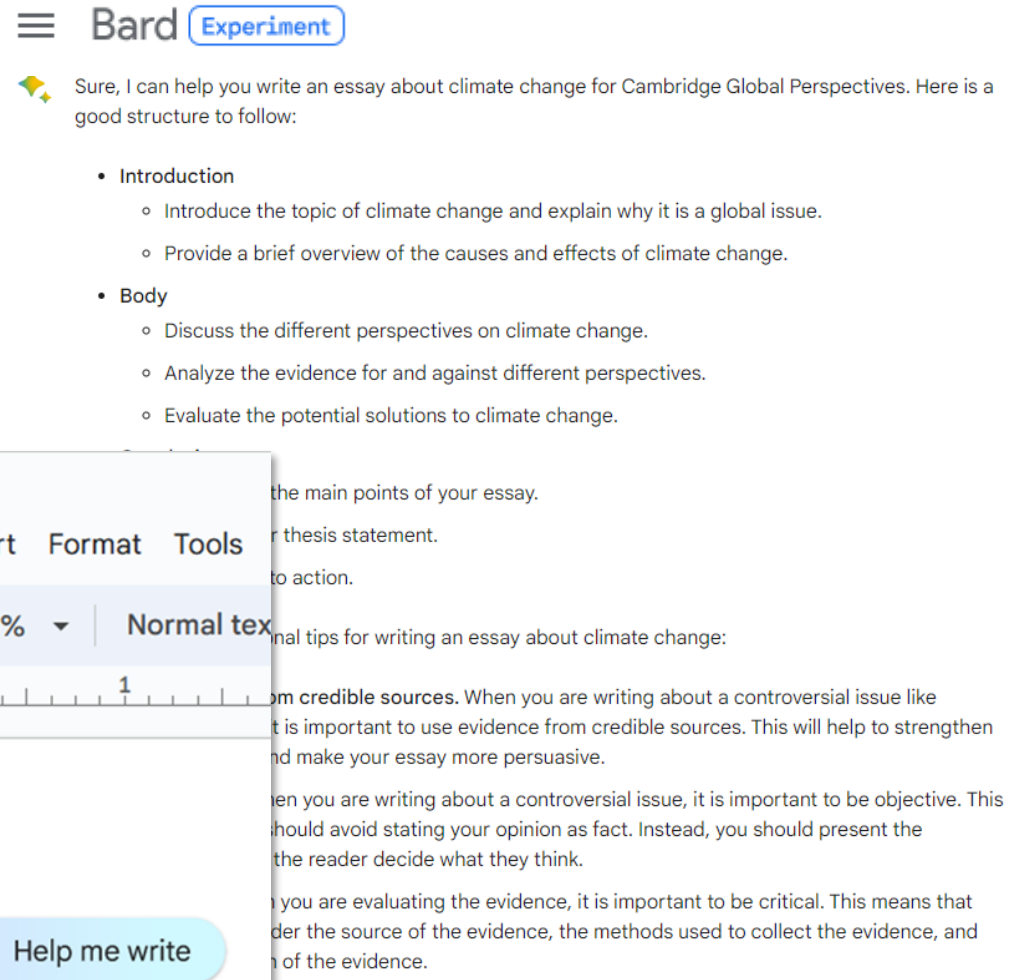
# Structuring and scaffolding

- Use of AI to support existing practice
- Providing a structure for an extended essay
- Drafting work in class
- Discussion and awareness of AI 'hallucination' and confabulation
- Encouraging the importance of reviewing, checking sources, traceability
- Academic honesty



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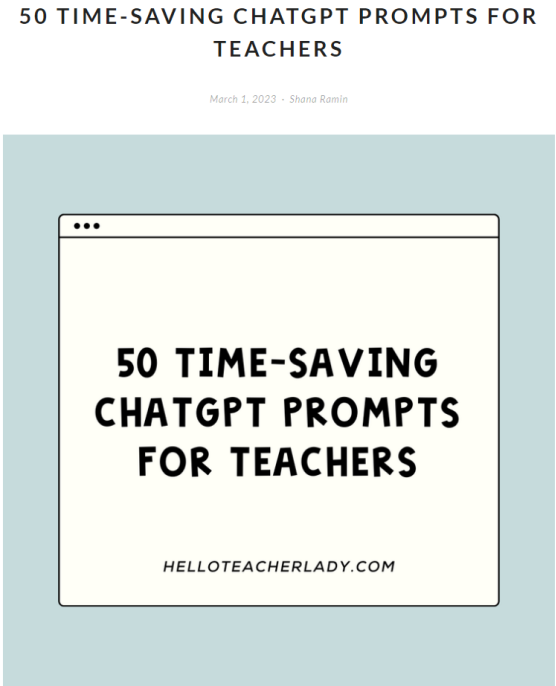
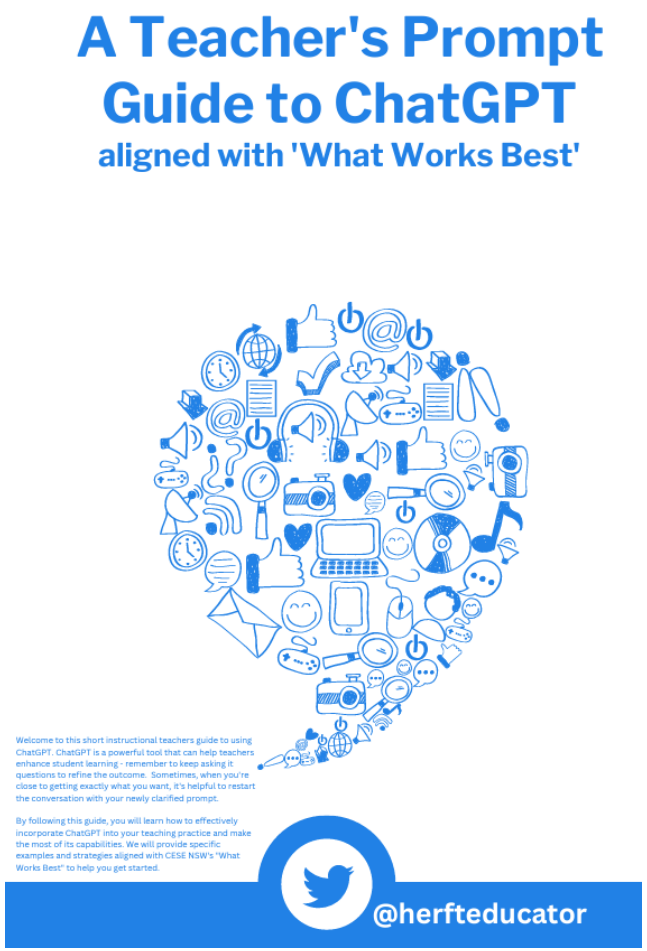
# Planning

- Supporting teacher workload
- Differentiation and adaptation
- Process of scoping and sequencing a learning progression
- Use of specific and complex prompts
- Importance of teacher mitigation – experience, expertise, and ‘a human in the loop’



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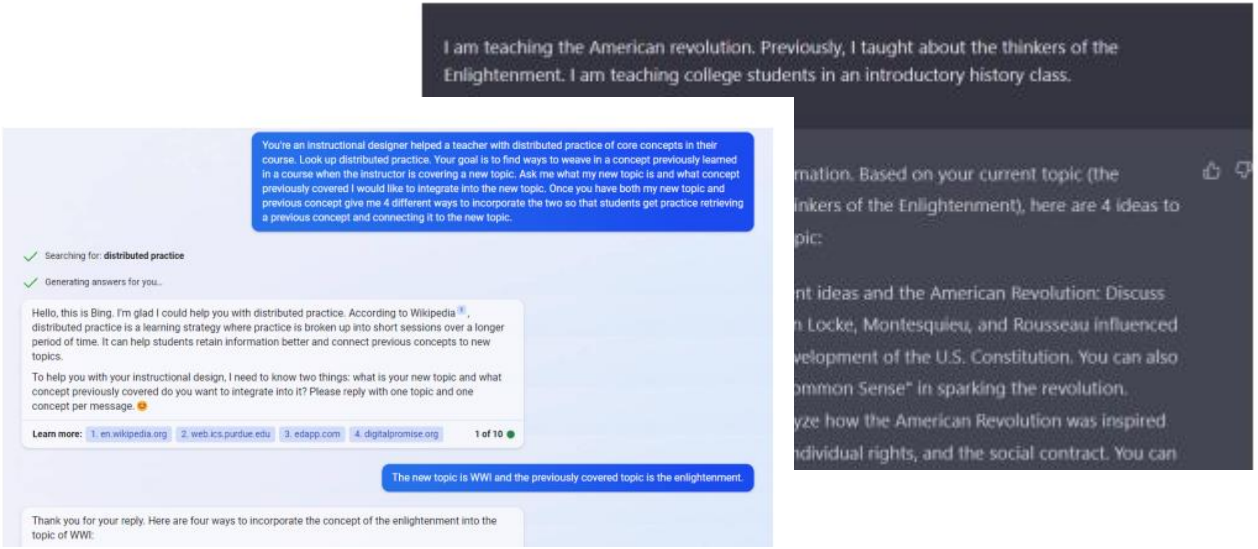
# Effective questioning

- Emerging powerful approaches to use AI
- Prompt engineering
- *Promptcraft*
- Teachers' existing skills and expertise
- AI as a 'force multiplier'




## Using AI to Implement Effective Teaching Strategies in Classrooms: Five Strategies, Including Prompts

26 Pages • Posted: 24 Mar 2023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Date Written: March 17, 2023


**Abstract**

This paper provides guidance for using AI to quickly and easily implement evidence-based teaching strategies that instructors can integrate into their teaching. We discuss five teaching strategies that have proven value but are hard to implement in practice due to time and effort constraints. We show how AI can help instructors create material that supports these strategies and improve student learning. The strategies include providing multiple examples and explanations; uncovering and addressing student misconceptions; frequent low-stakes testing; assessing student learning; and distributed practice. The paper provides guidelines for how AI can support each strategy, and discusses both the promises and perils of this approach, arguing that AI may act as a "force multiplier" for instructors if implemented cautiously and thoughtfully in service of evidence-based teaching practices.



**Keywords:** AI, GPT4, ChatGPT, Learning

**Suggested Citation:**

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# Cambridge Schools AI usage

Using AI tools to teach pupils in its use

Manage data and generate reports

Using AI tools to train teachers in its use

Generate model texts and questions

Create quizzes and tests

Design research and revision notes

Using Gen AI created simulations

Create personalised feedback for pupils

Create personalised lesson plans



Design and organise learning materials

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# Immediate actions for a school

**1. Define an AI strategy**

Define an AI strategy to create value in education and give teachers security in how to approach AI - Microsoft Training

**2. Invest in staff**

Give teachers time to explore the potential of AI in developing tools such as Microsoft's Co-pilot

**3. Identify the benefits**

Identify how AI can benefit/support the whole of the teaching, learning and assessment ecosystem

**4. Consider the use of an LLM**

A Large Language Model for your school with help to manage access to open AI applications, like ChatGPT and place controls on the content students can access

Remember, AI is here to augment and support, not to replace!

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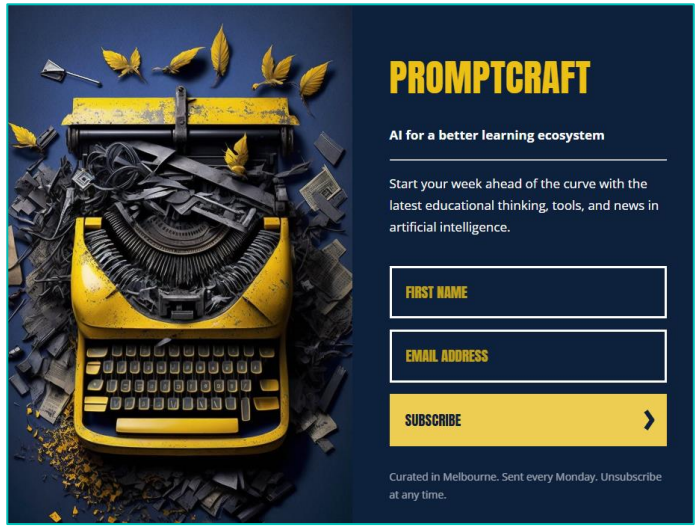
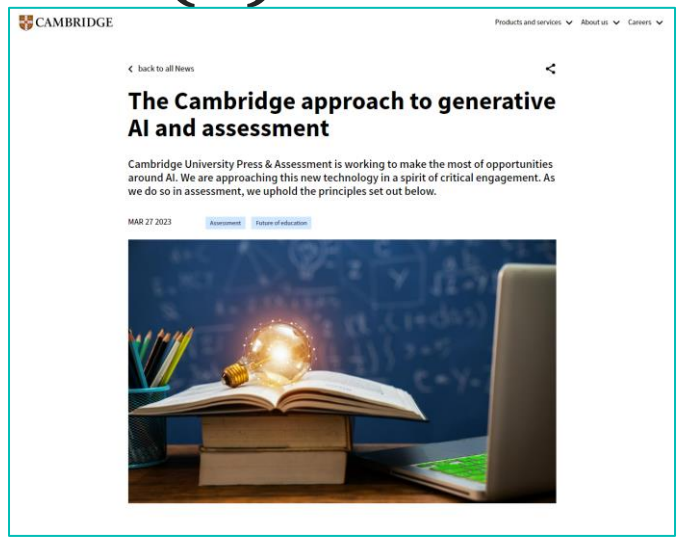
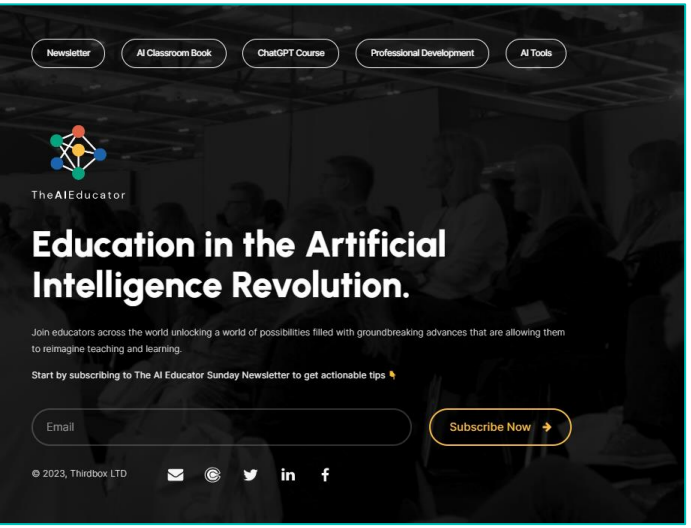
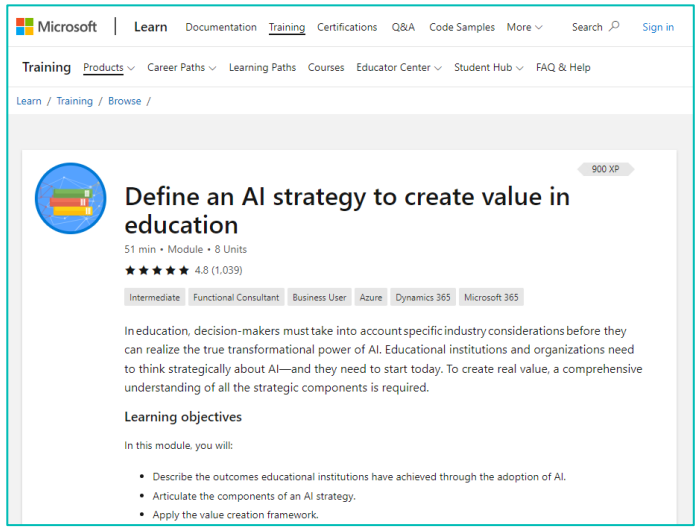
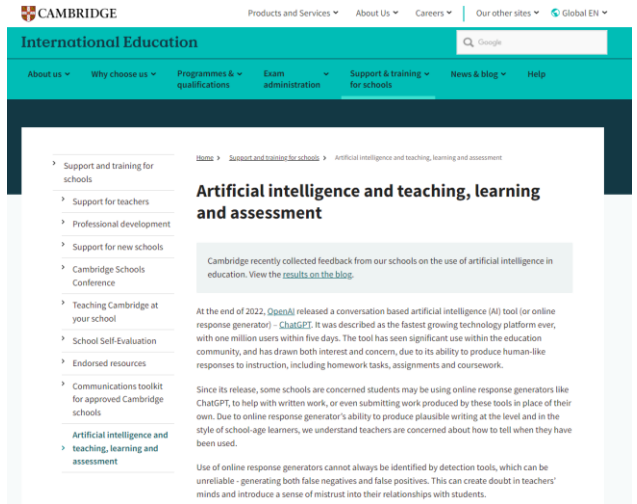
# Useful references for AI and education (1)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# Useful references for AI and education (2)

The U.S. Department of Education Office of Educational Technology's new policy report, **AI and the Future of Teaching and Learning: Insights and Recommendations**
https://tech.ed.gov/ai-future-of-teaching-and-learning/

The AI Educator - https://theaieducator.io/

Microsoft Training – Define an AI strategy to create value in education
https://learn.microsoft.com/en-us/training/modules/ai-strategy-in-education/

The Cambridge approach to generative AI and assessment
https://www.cambridge.org/news-and-insights/news/The-Cambridge-approach-to-generative-AI-and-assessment

Cambridge International - Artificial intelligence and teaching, learning and assessment
https://www.cambridgeinternational.org/support-and-training-for-schools/artificial-intelligence/

Preventing plagiarism - guidance for teachers
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# Useful references for AI and education (3)

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Promptcraft - https://edte.ch/blog/promptcraft/?v=3a1ed7090bfa

https://www.herfteducator.com/

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https://www.teachingchannel.com/k12-hub/blog/50-chat-gpt-prompts-for-teachers/

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# Useful references for AI and education (4)

Ethan Mollick's blog: https://www.oneusefulthing.org/

Using AI to Implement Effective Teaching Strategies in Classrooms: Five Strategies, Including Prompts (Molick and Molick)

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4391243

Assigning AI: Seven Approaches for Students, with Prompts (Molick and Molick)

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4475995&utm_source=substack&utm_medium=email

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# Get in touch!

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