



Cambridge Assessment  
International Education

Cambridge Schools Conference, Orlando  
23-24 June 2023  
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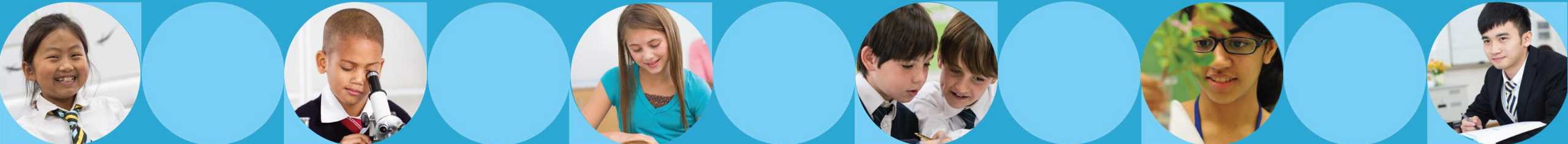
# Generative AI and its Impact on Teaching, Learning & Assessment

Dr Jesse Dvorchak – Head of Digital Assessment & Evaluation

Sanjay Mistry – Head of Research for Digital Assessment & Evaluation

Lee Davis – Director, Teaching & Learning

June 23, 2024



# 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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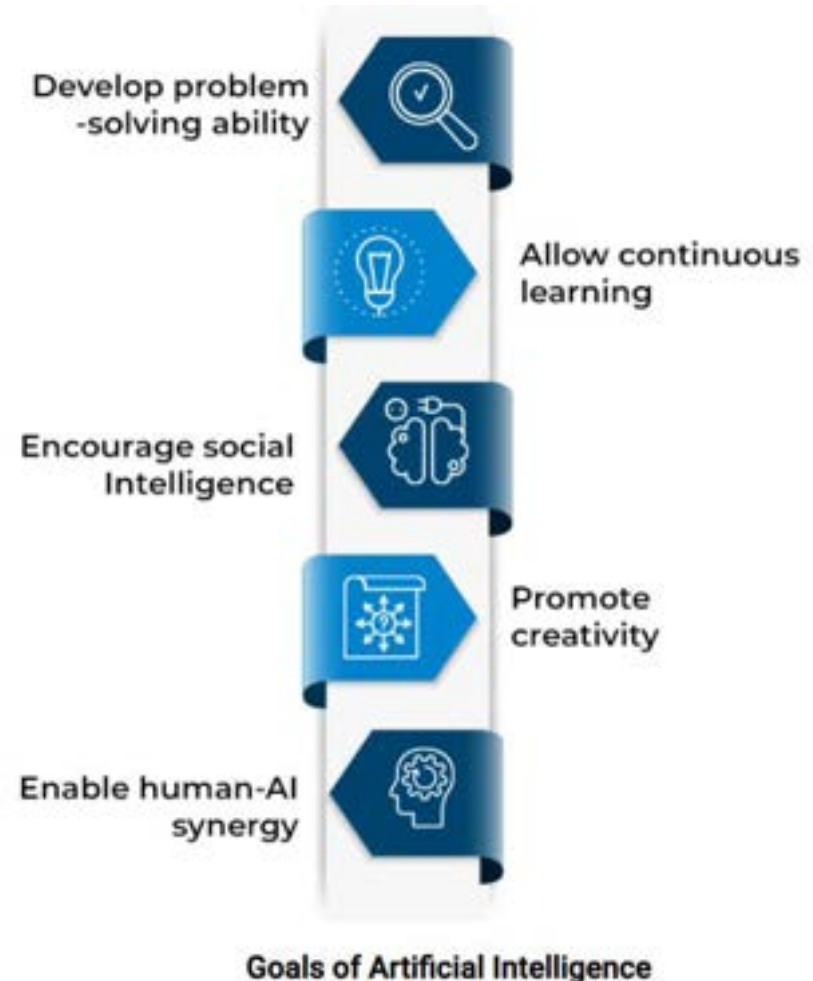
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# Contents slide

- ▶ Defining AI
- ▶ Understanding the impact of AI in assessment
- ▶ Cambridge's response to AI in assessment
- ▶ Considering AI in Teaching & Learning

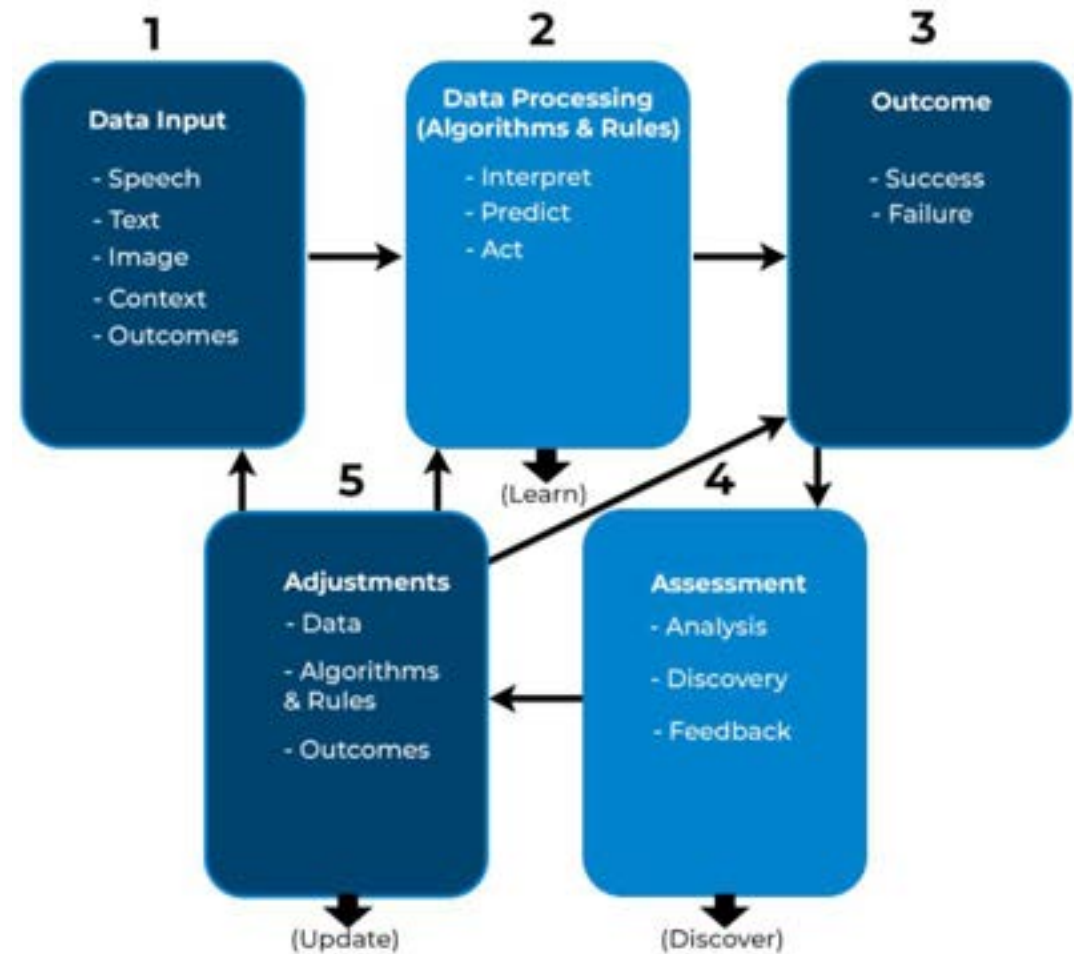
# Defining AI Uses & Purpose

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



# How does AI work?

- ▶ Let's give it a try...
- ▶ How do you make a cup of tea?
  - ▶ Take 2 mins to list in order all of the steps you regularly use to make a cup of tea
  - ▶ Be as specific as possible



How AI Works

# 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?

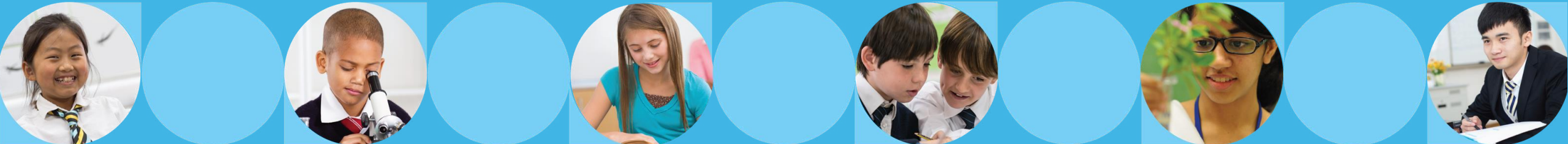
Discuss with colleagues around you and then be ready to share examples.

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



*Researching all of the way around the concept*

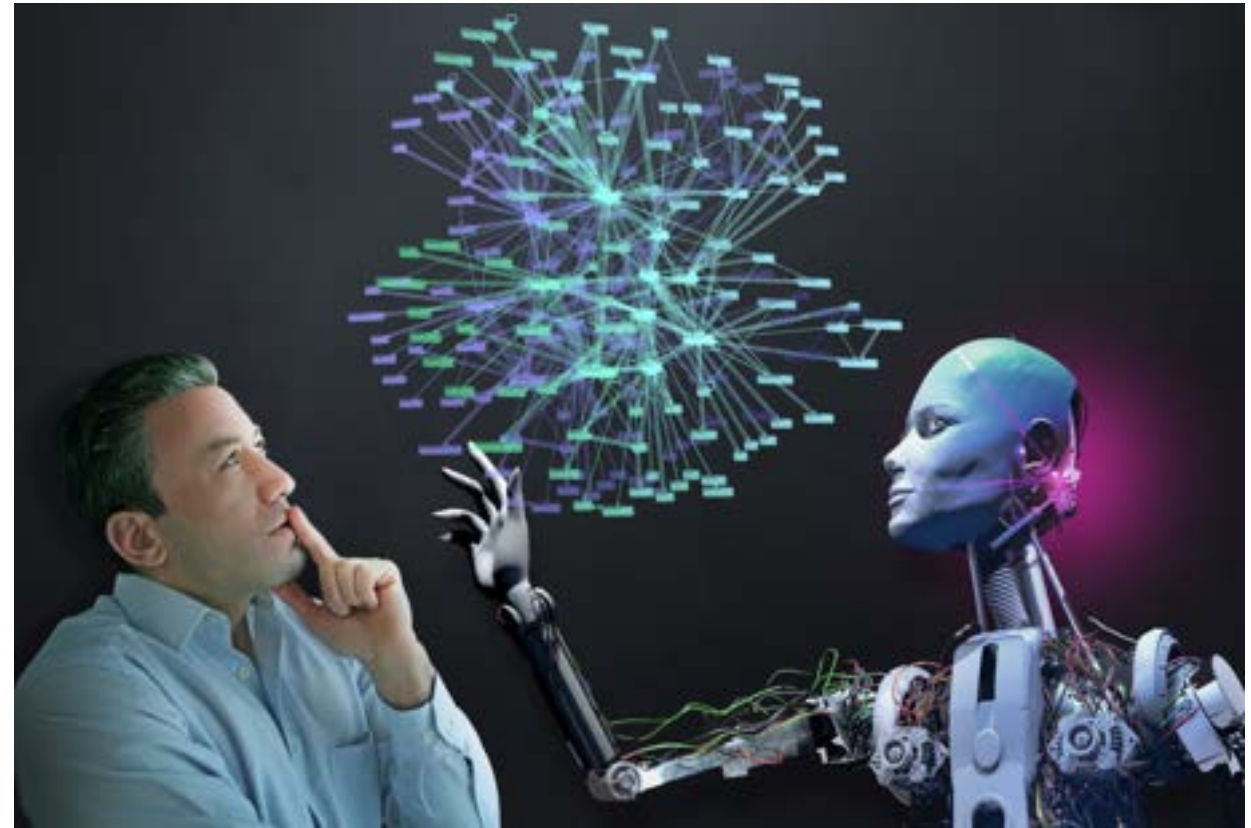
# Understanding the Impact on Assessment



# 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?



[This Photo](#) by Unknown Author is licensed under [CC BY](#)

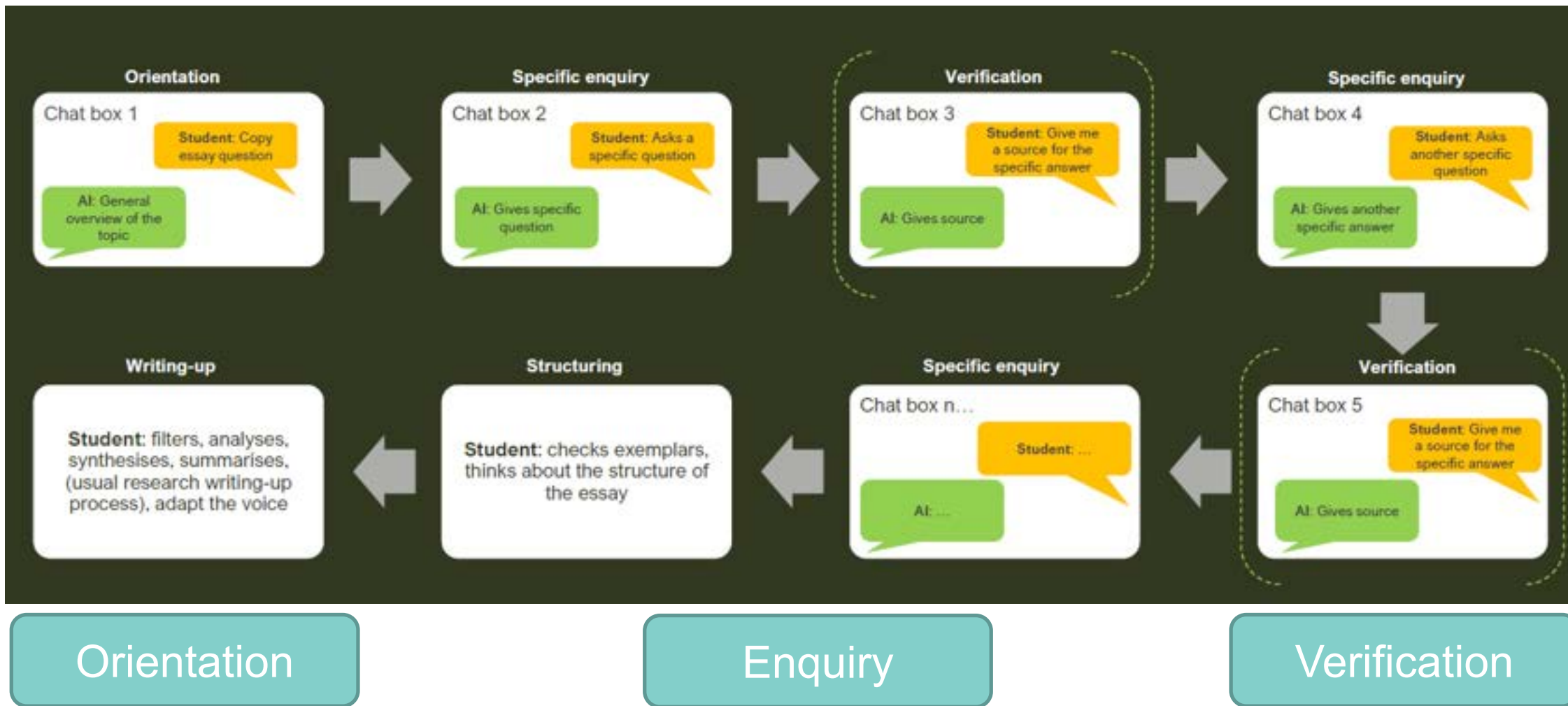
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# How the students used AI



# What students said about the process



“You need to apply your research skills and select and synthesize. You will get a very low mark just using ChatGPT. You can't just copy and paste.”



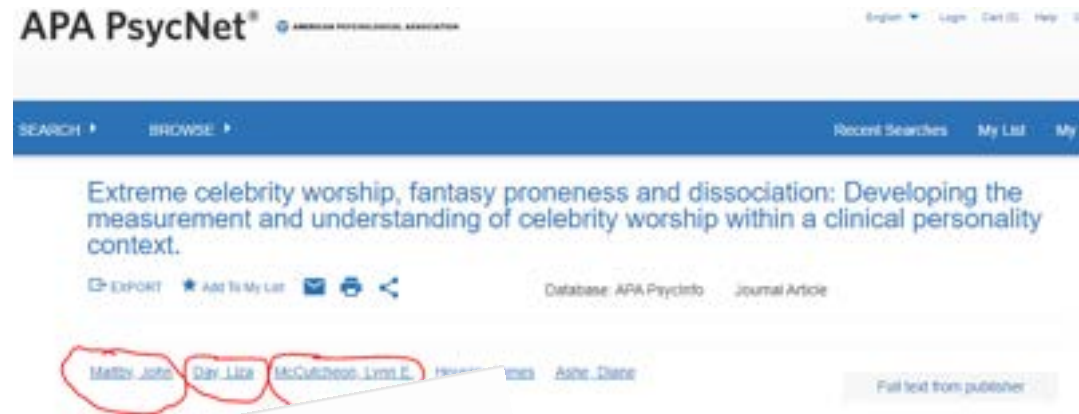
“[ChatGPT is] useful for giving an overview of the topic you don't know anything about but you can't trust it, so you have to verify everything, which is time-consuming”



“I feel it'd be very difficult to write a whole essay purely on ChatGPT [...] I messed around with trying introductions and conclusions. And they were very poor because it doesn't come to a conclusion.”

# 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

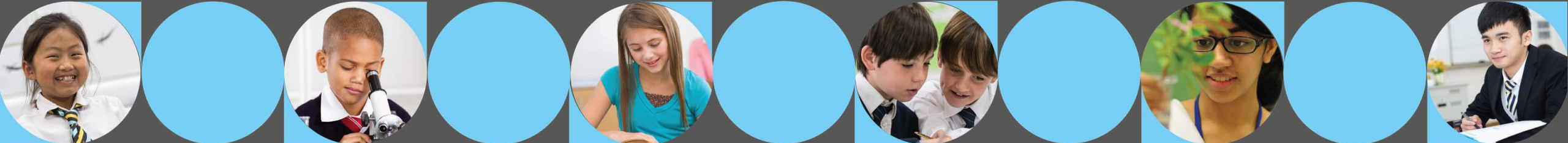
This DOI cannot be found in the DOI System. Possible reasons are:

- 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, including punctuation marks.
- The DOI has not been activated yet. If you are the publisher, contact your DOI registration agency.

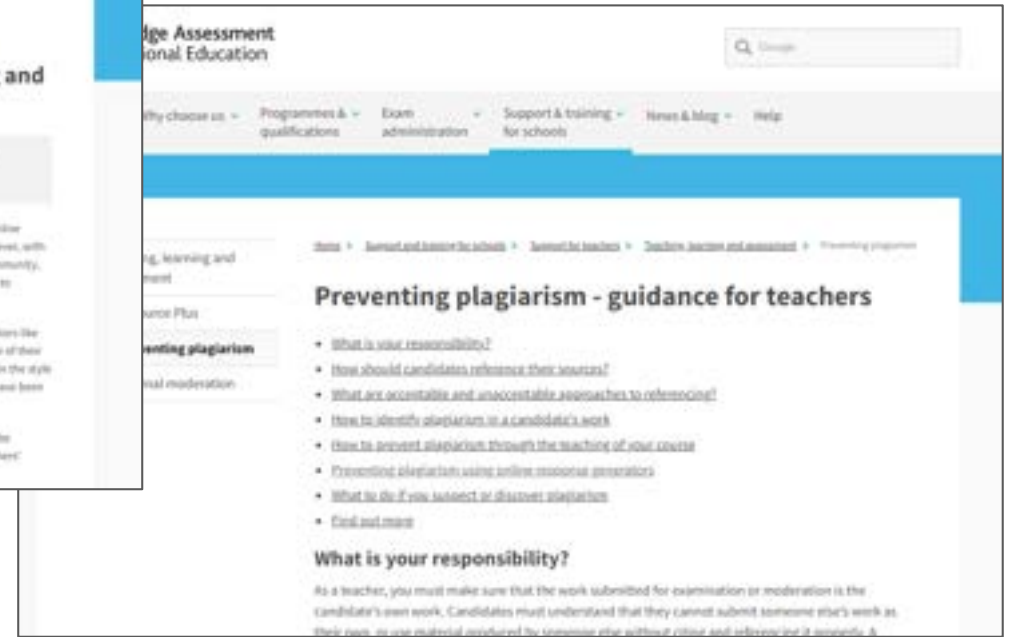
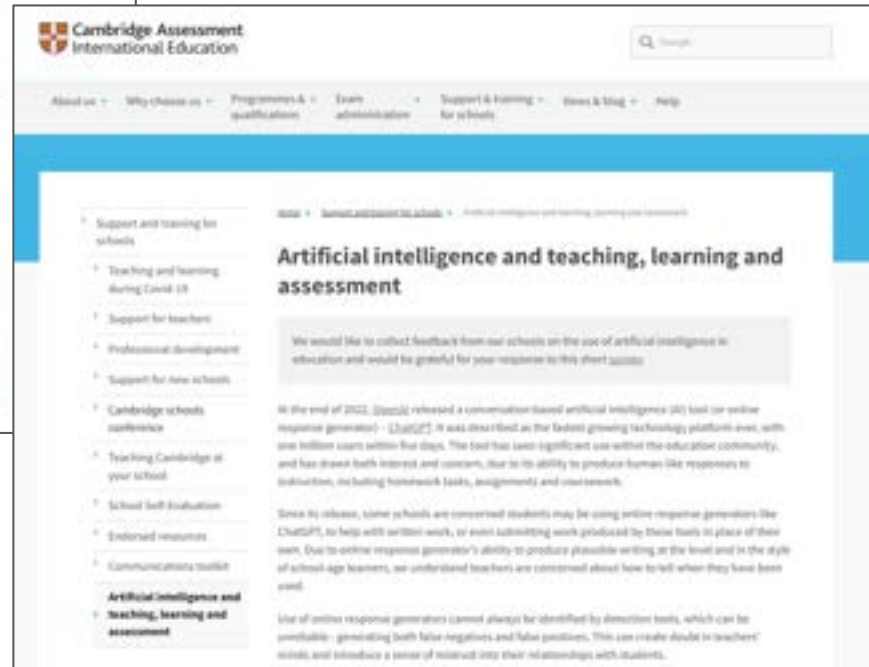
Your search - "Celebrity Worship and Its Relation to Mental Health: A Longitudinal Study" - did not match any articles.



# Cambridge's Response to AI in Assessment



# 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 AI policy to be released in July 2023
- ▶ AI policies for Live Exam Series
  - ▶ Any digital assessments will have a locked-down platform

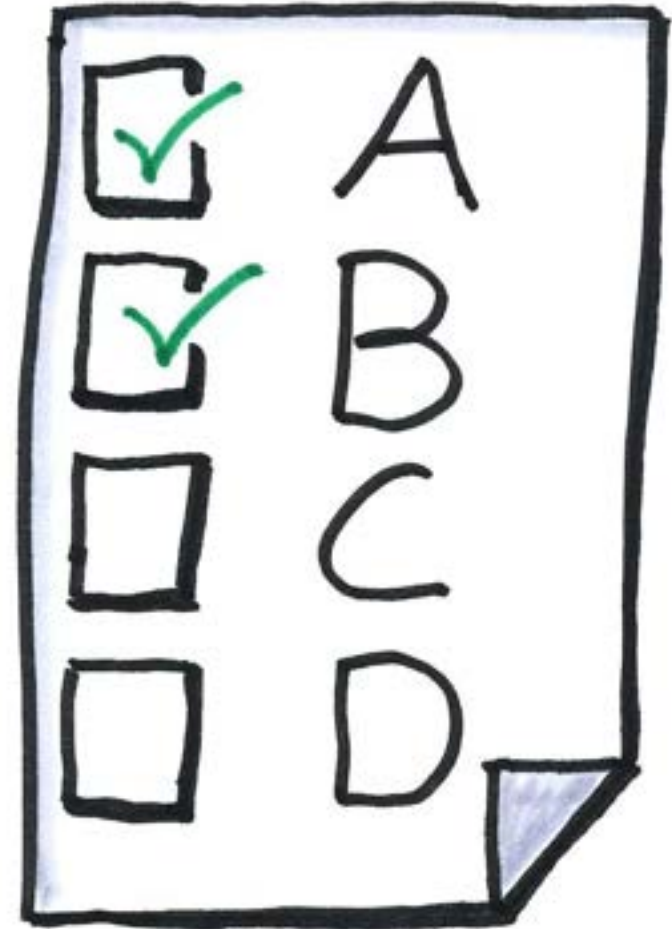
# Applications for Developing Assessment Content

- ▶ 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



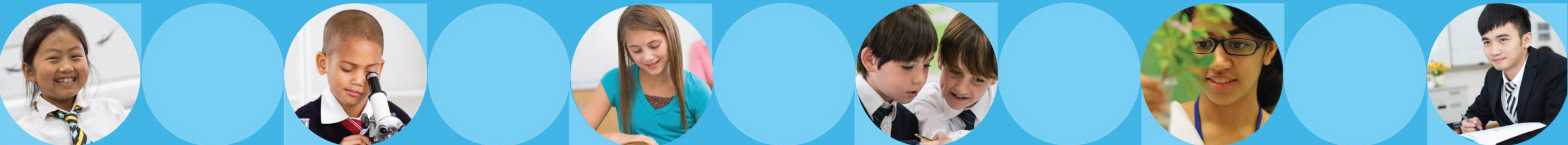
# Using AI for Scoring

- ▶ 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



*It's still learning and teaching...*

# Understanding the Impact on Teaching & Learning



# Uses of AI in the classroom - June 2023

**Question  
generation**

**Mark scheme  
creation**

**Response  
checking**

**Drafting  
tool**

**Resource  
creation**

**Formative  
feedback**

**Support for  
revision**

**Planning &  
preparation**



# Seven Approaches...

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

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

# 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 future world

DAVID DE CARVALHO

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

Knowledge is power. It's the old adage that has been repeated for centuries. But in the age of AI, it's not just knowledge that matters, it's how it's used. The article discusses the challenges of education in a world where AI can do many of the tasks that were once the domain of humans. It argues that education must focus on developing skills that AI cannot replicate, such as critical thinking, creativity, and emotional intelligence. The author also discusses the importance of teaching students how to use AI tools effectively and responsibly.

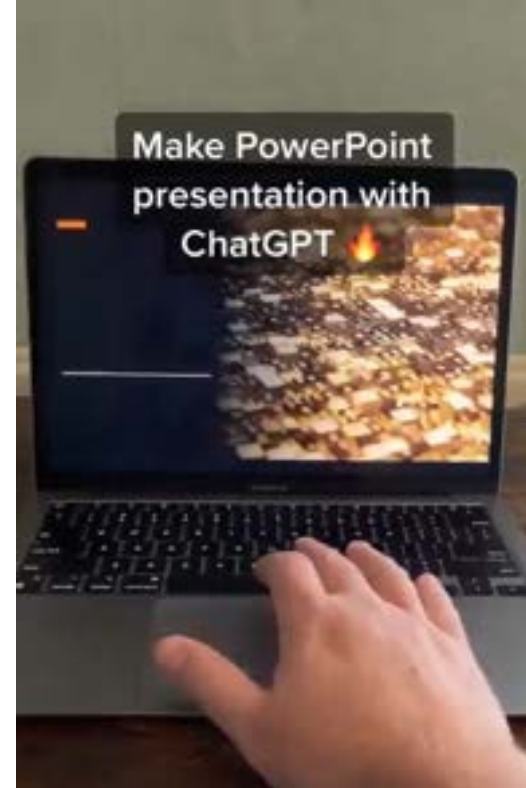
David de Carvalho is a senior lecturer in the Faculty of Education at the University of Queensland. He has published several articles on education and technology. He is also a frequent speaker at conferences and seminars. He is currently working on a book about the future of education in the age of AI.

Education is the key to a better future. It is the only way to ensure that our children are equipped for the challenges of the 21st century. We must ensure that our education system is focused on developing the skills and knowledge that our children need to succeed in a world where AI is becoming increasingly prevalent. We must also ensure that our education system is inclusive and accessible to all children, regardless of their background or abilities. Only then can we ensure that our children are prepared for the future.

# 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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## Teaching Cambridge at your school

- ▶ Implementing the curriculum with Cambridge
- ▶ Developing your school with Cambridge
- ▶ Developing the Cambridge learner attributes
- ▶ Cambridge principles into practice - languages guide for schools
- ▶ Education briefs
- ▶ Getting started with...
- ▶ Great teaching toolkit: Evidence review

[Home](#) > [Support and training for schools](#) > [Teaching Cambridge at your school](#)

## Teaching Cambridge at your school



We are committed to providing a high level of support for school leaders and teachers delivering Cambridge programmes.

We've produced a series of resources to support the teaching and learning in your school. They explore different aspects of educational practice, from designing a curriculum to improving the quality of classroom activity.

These pages bring together a collection of these resources. They examine important educational themes and show how they are relevant to Cambridge schools.

Here you will find:

- **Implementing the curriculum with Cambridge** – practical advice on designing, developing, implementing and evaluating your curriculum.
- **Developing your school with Cambridge** – focusing on classroom-level activity, guidance on improving the quality of teaching and learning in your school.

# 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

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## 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 (William, 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.



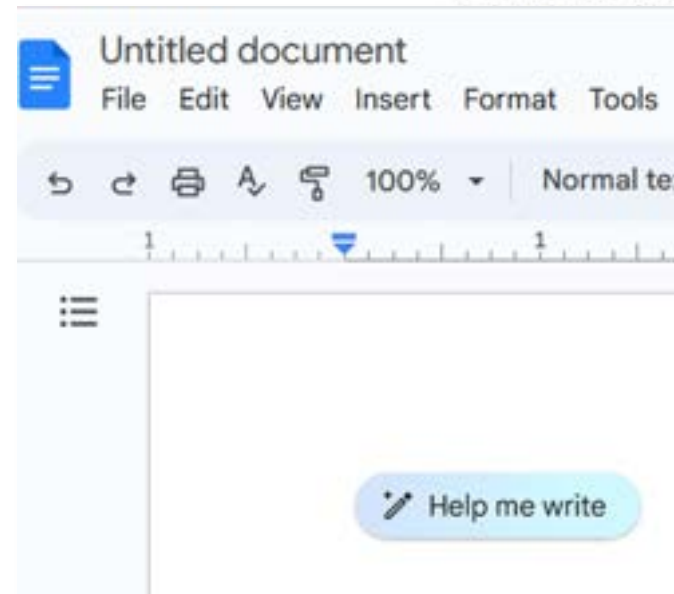
# Structuring and scaffolding

- ▶ 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

☰ Bard Experiment

✦ Sure, I can help you write an essay about climate change for Cambridge Global Perspectives. Here is a good structure to follow:

- Introduction
  - Introduce the topic of climate change and explain why it is a global issue.
  - Provide a brief overview of the causes and effects of climate change.
- Body
  - Discuss the different perspectives on climate change.
  - Analyze the evidence for and against different perspectives.



utions to climate change.

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riting an essay about climate change:

ources. When you are writing about a controversial issue like  
to use evidence from credible sources. This will help to strengthen  
essay more persuasive.

riting about a controversial issue, it is important to be objective. This  
tating your opinion as fact. Instead, you should present the  
side what they think.

uating the evidence, it is important to be critical. This means that  
e of the evidence, the methods used to collect the evidence, and  
nce.

# 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’

## 50 TIME-SAVING CHATGPT PROMPTS FOR TEACHERS

March 1, 2023 - David Davis



## A Teacher's Prompt Guide to ChatGPT aligned with 'What Works Best'



Warning: This is a powerful tool that can help you create content faster than ever before. However, it is important to use it responsibly. Always double-check the information you receive and never share sensitive information.

By following this guide, you will be able to effectively use ChatGPT to create content faster and more efficiently. We will provide you with the tools and techniques you need to get the most out of this powerful tool.



# Effective questioning

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

I am teaching the American revolution. Previously, I taught about the thinkers of the Enlightenment. I am teaching college students in an introductory history class.

The screenshot shows a chat window with a user prompt and an AI response. The prompt is: "I am teaching the American revolution. Previously, I taught about the thinkers of the Enlightenment. I am teaching college students in an introductory history class." The AI response is: "Based on your current topic (the thinkers of the Enlightenment), here are 4 ideas to incorporate into your lesson plan: 1. Discuss the Enlightenment thinkers and the American Revolution: Discuss how Locke, Montesquieu, and Rousseau influenced the development of the U.S. Constitution. You can also discuss the concept of 'Common Sense' in sparking the revolution. 2. Analyze how the American Revolution was inspired by Enlightenment ideas: Discuss how the American Revolution was inspired by Enlightenment ideas, such as individual rights, and the social contract. You can also discuss how the American Revolution was inspired by Enlightenment ideas, such as individual rights, and the social contract. You can also discuss how the American Revolution was inspired by Enlightenment ideas, such as individual rights, and the social contract." The chat interface includes a text input field at the bottom and a list of previous messages on the left.

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

26 Pages • Posted: 24 Mar 2023

Ethan R. Mollick

University of Pennsylvania - Wharton School

Lilach Mollick

University of Pennsylvania - Wharton School

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:



# Useful references for AI and education



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## Artificial Intelligence and the Future of Teaching and Learning

The U.S. Department of Education Office of Educational Technology's new policy report, **Artificial Intelligence and the Future of Teaching and Learning: Insights and Recommendations**, addresses the clear need for sharing knowledge, engaging educators, and refining technology plans and policies for artificial intelligence (AI) use in education. The report describes AI as a rapidly-advancing set of technologies for recognizing patterns in data and automating actions, and guides educators in understanding what these emerging technologies can do to advance educational goals—while evaluating and limiting key risks.

[Download](#)

[Core Messages](#)



## PROMPTCRAFT

AI for a better learning ecosystem

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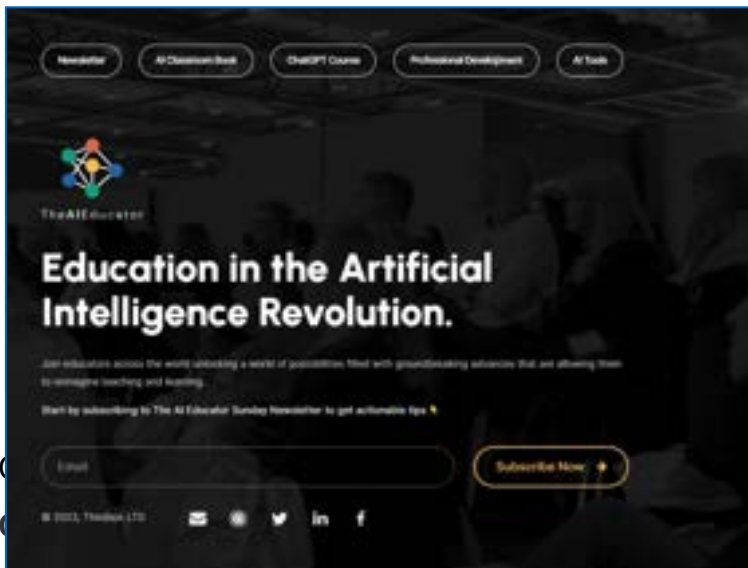


**CAMBRIDGE**

## The Cambridge approach to generative AI and assessment

Cambridge University Press & Assessment is working to make the most of opportunities around AI. We are approaching this new technology in a spirit of critical engagement. As we do so in assessment, we uphold the principles set out below.

16th of 2023



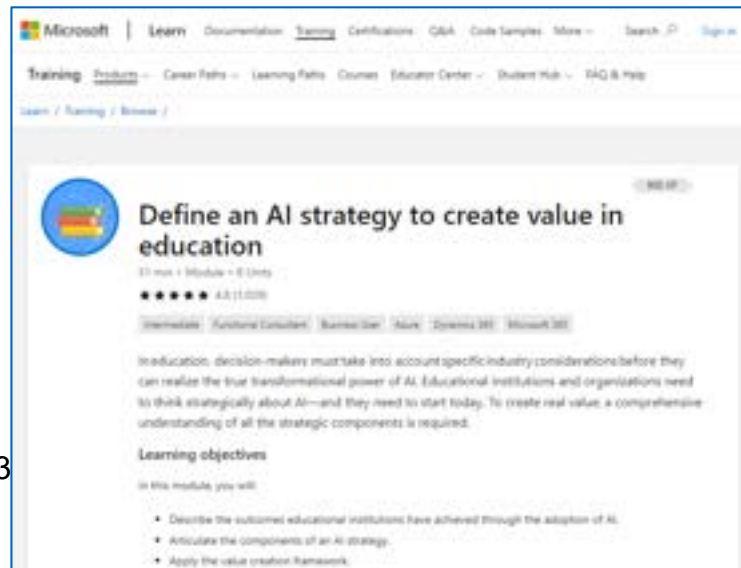
Newsletter AI Classroom Book ChatGPT Course Professional Development AI Tools

## Education in the Artificial Intelligence Revolution.

Join educators across the world unlocking a world of possibilities, filled with groundbreaking advances that are allowing them to reimagine teaching and learning.

Start by subscribing to The AI Educator Sunday newsletter to get actionable tips

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## Define an AI strategy to create value in education

17 min • 1 module • 4 steps

★★★★★ 4.2 (1,016)

Intermediate | Suitable for students | Beginner level | AI | Systems 2023 | Microsoft 365

In education, decision-makers must take into account specific industry considerations before they can realize the true transformational power of AI. Educational institutions and organizations need to think strategically about AI—and they need to start today. To create real value, a comprehensive understanding of all the strategic components is required.

### Learning objectives

In this module, you will:

- Describe the outcomes educational institutions have achieved through the adoption of AI.
- Articulate the components of an AI strategy.
- Apply the value creation framework.



Cambridge Assessment International Education

## Artificial intelligence and teaching, learning and assessment

We would like to collect feedback from our schools on the use of artificial intelligence in education and would be grateful for your responses to this short survey.

At the end of 2022, Cambridge released a conversation-based artificial intelligence (AI) tool for online response generation (ChatGPT). It was described as the fastest growing technology platform ever, with over million users within five days. The tool has seen significant use within the education community, and has drawn both interest and concern, due to its ability to produce human-like responses to questions, including homework tasks, assignments and coursework.

Since its release, some schools are concerned students may be using online response generators like ChatGPT, to help with written work, or even submitting work produced by these tools in place of their own. Due to online response generator's ability to produce plausible writing, at the level and in the style of school age learners, we understand teachers are concerned about how to tell when they have been used.

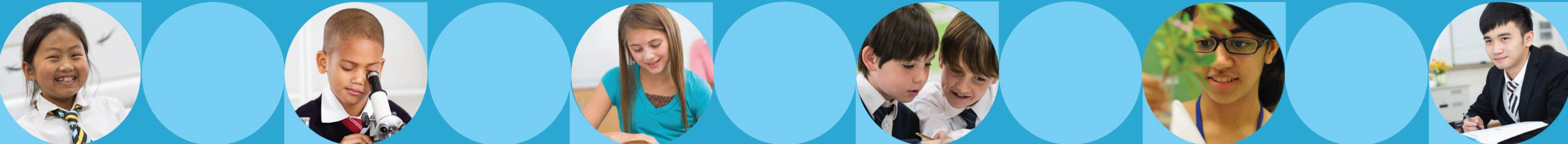
Use of online response generation cannot always be identified by detection tools, which can be unreliable, generating both false negatives and false positives. This can create doubt to how best



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**Thank you**  
**Any questions?**





# Your feedback

- ▶ Please let us know your views on this session
- ▶ Scan the QR code and share your feedback with us



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or telephone +44 1223 553554

