

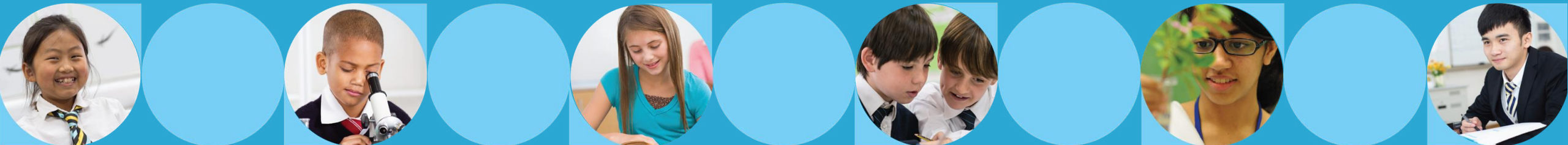
Generative AI and its Impact on Teaching, Learning & Assessment

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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

Cambridge Schools Conference, Orlando, 23-24 June 2023

Creating a positive environment for academic success

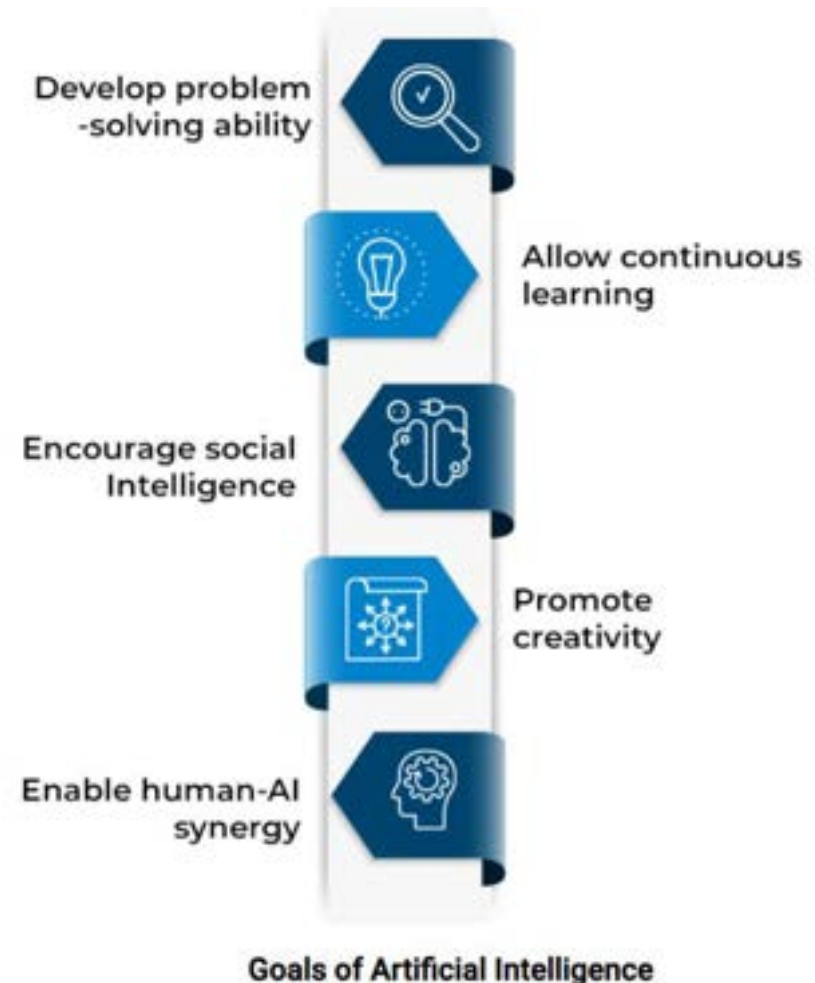
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Contents slide

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

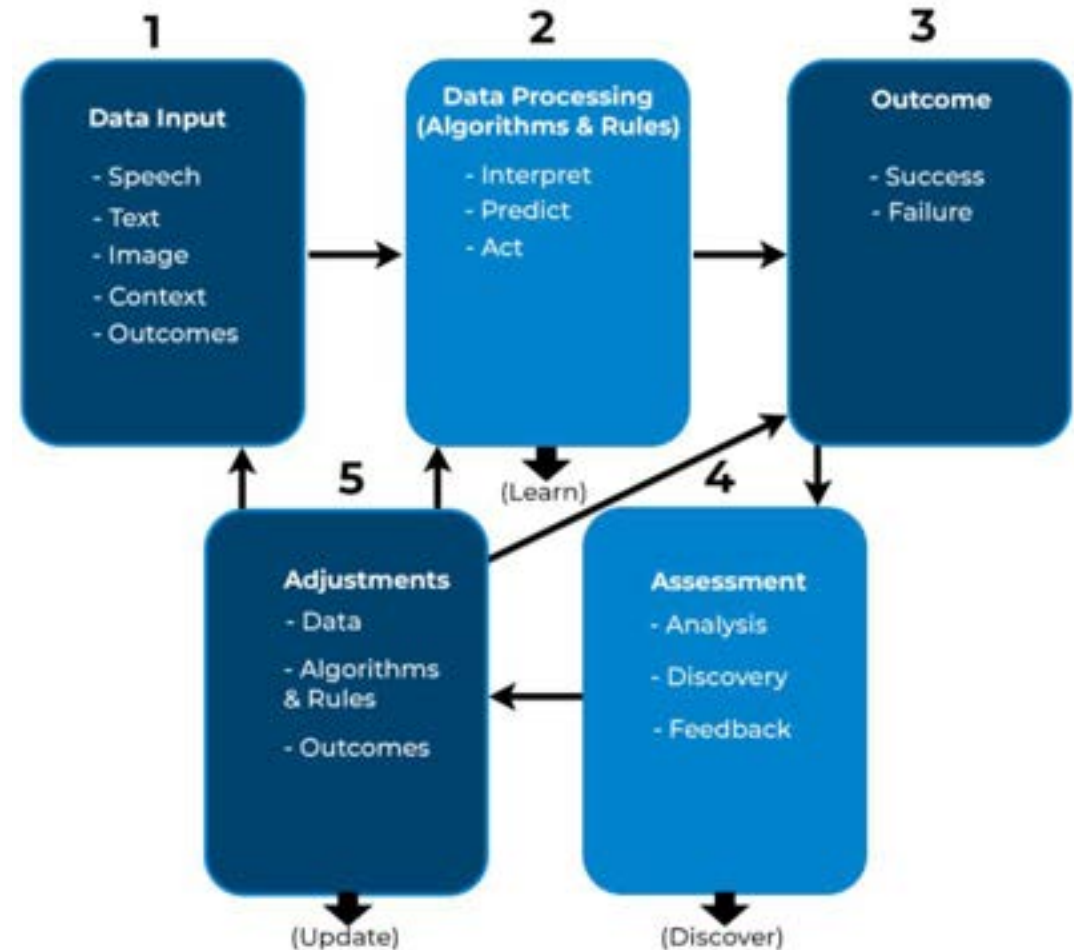
Defining AI Uses & Purpose

- ▶ 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?

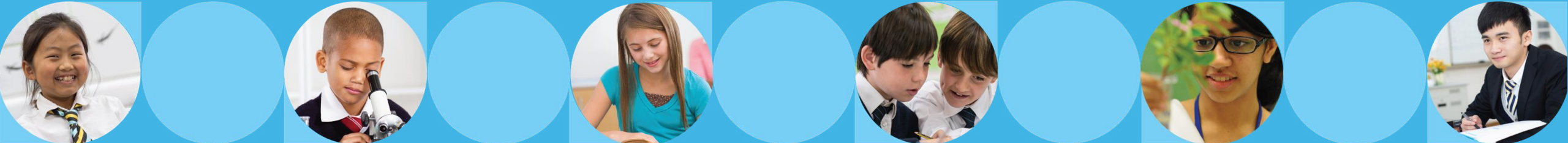
- Have you come across any risks or issues whilst using AI in the classroom?
- How have you and/ or your school dealt with them?
- What concerns do you have for the future?

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

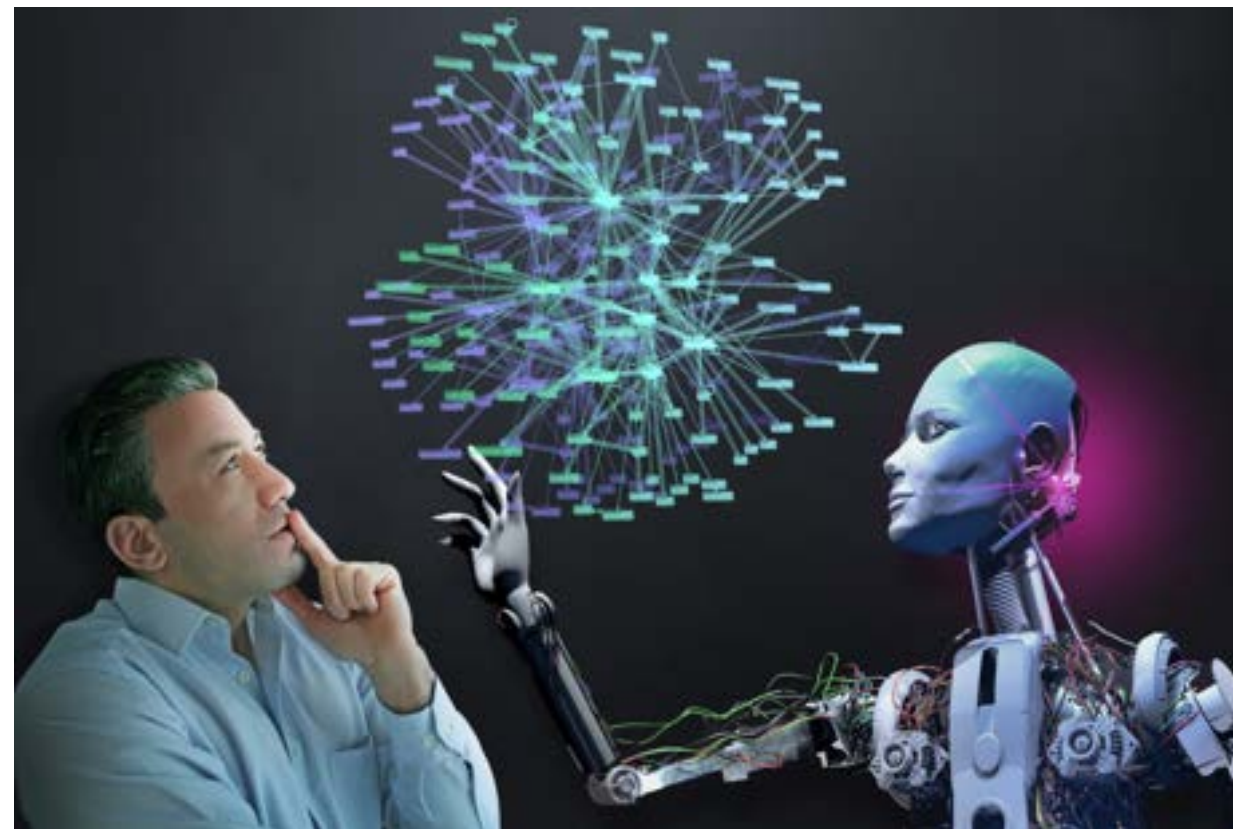
Understanding the Impact on Assessment



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?



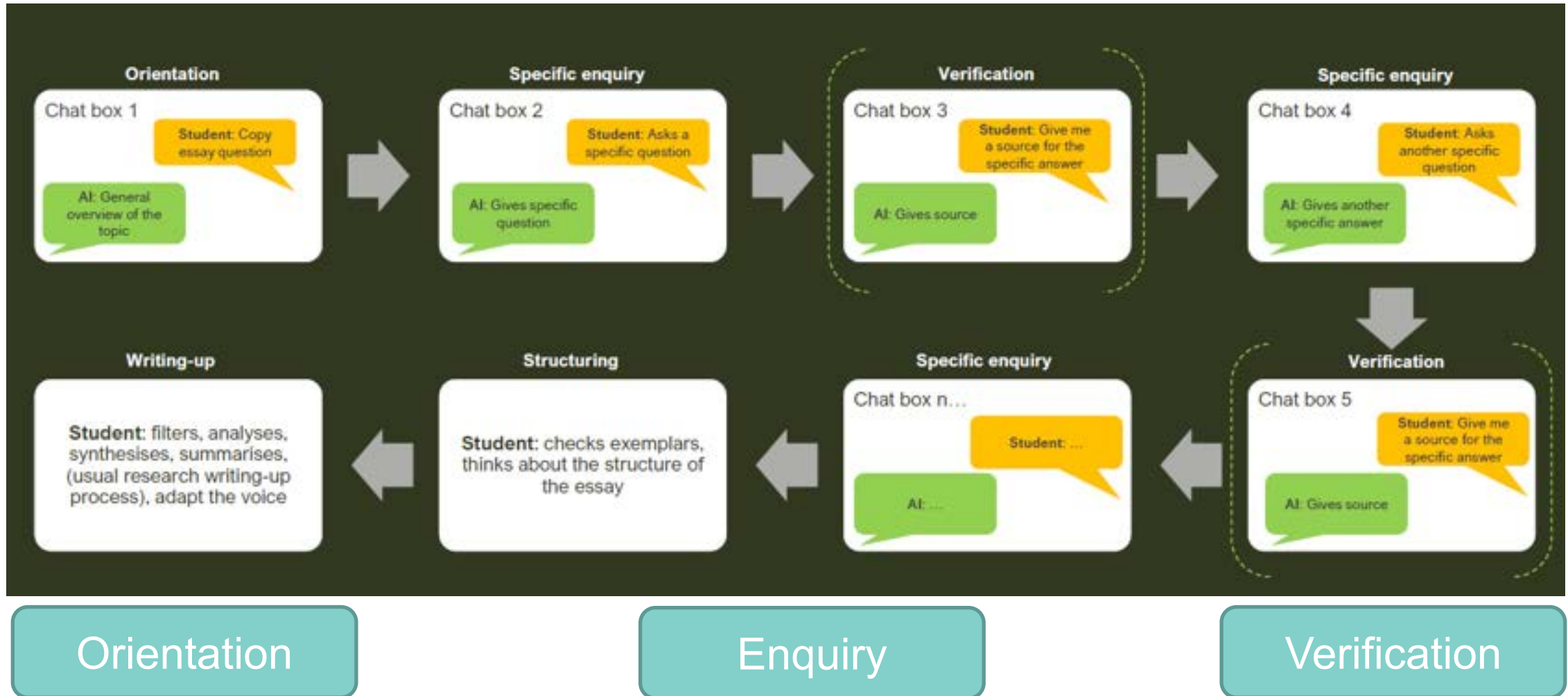
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How the students used AI



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”

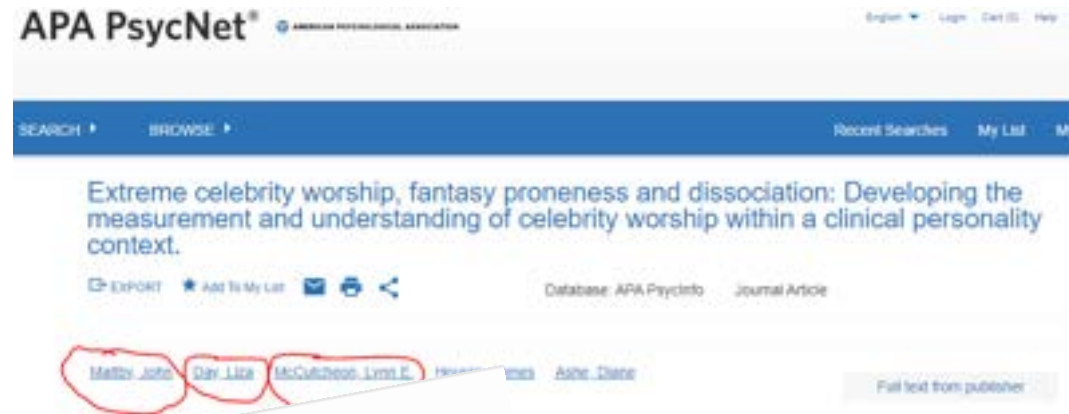


“I feel it'd be very difficult to write a whole essay purely on ChatGPT [...] I messed around with trying introductions and conclusions. And they were very poor because it doesn't come to a conclusion.”

Deepfakes and spurious sources

11

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

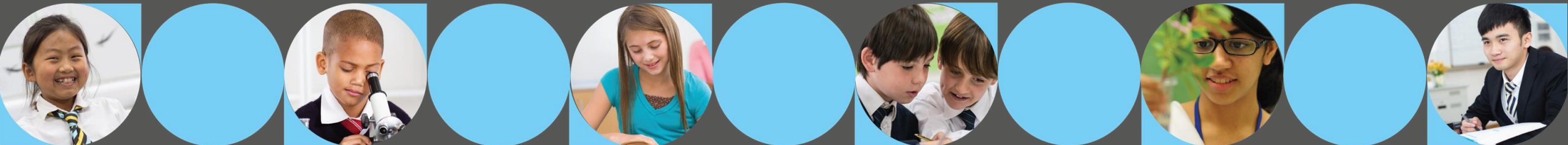


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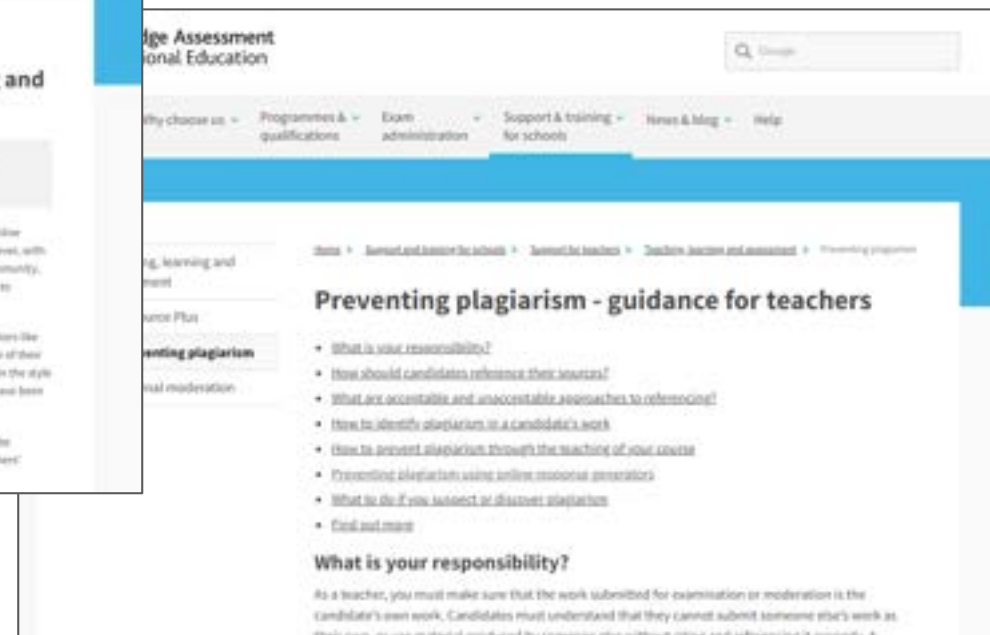
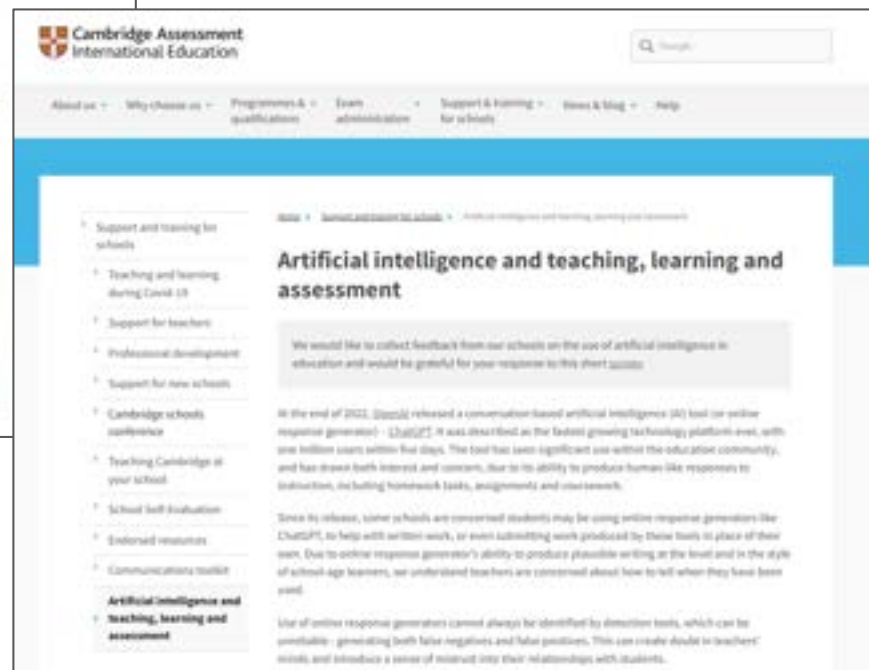
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Cambridge's Response to AI in Assessment



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

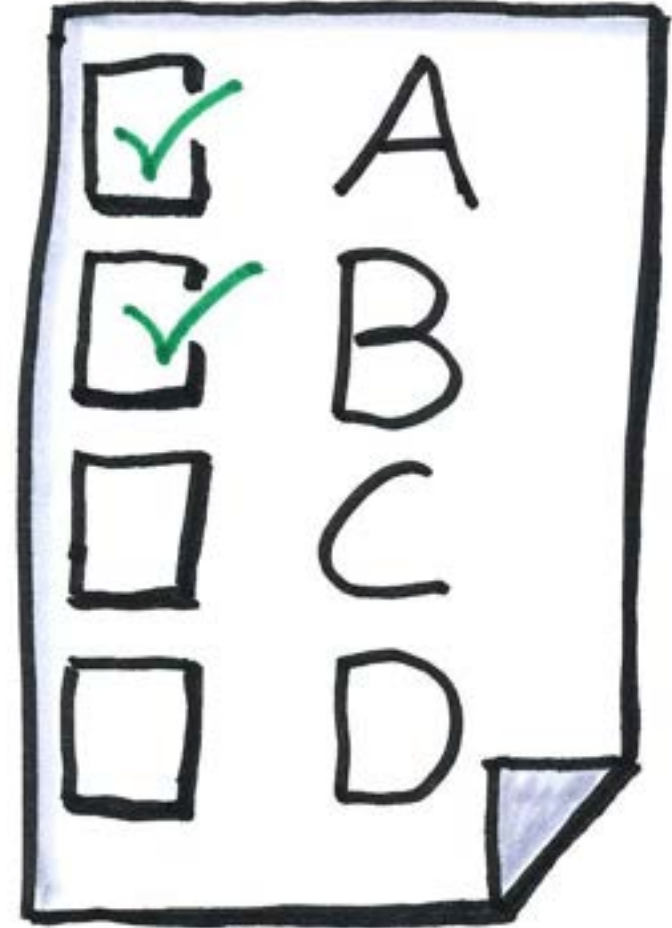
Applications for Developing Assessment Content

- ▶ 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



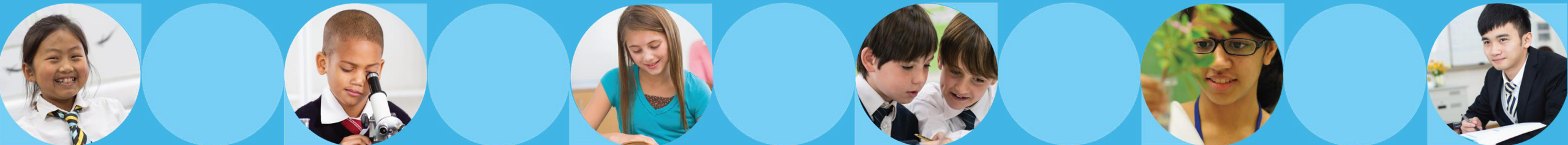
Using AI for Scoring

- ▶ 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
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.

[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



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THE AUSTRALIAN

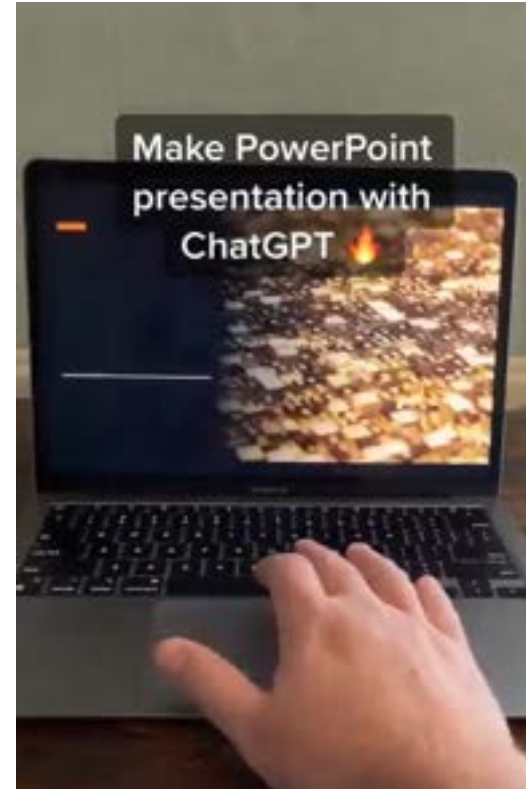
Friday, June 16, 2023



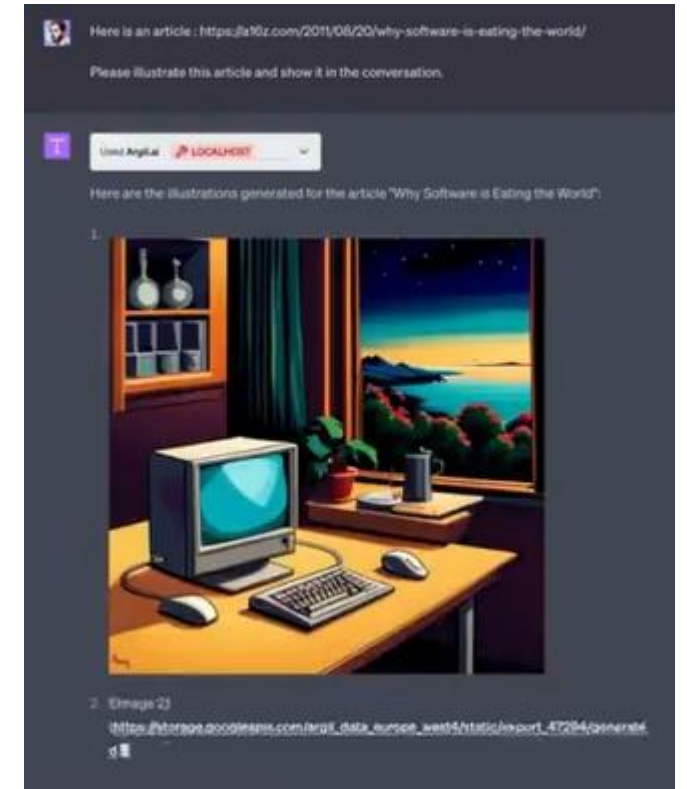
Huge opportunities with AI – more than a tool?



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.

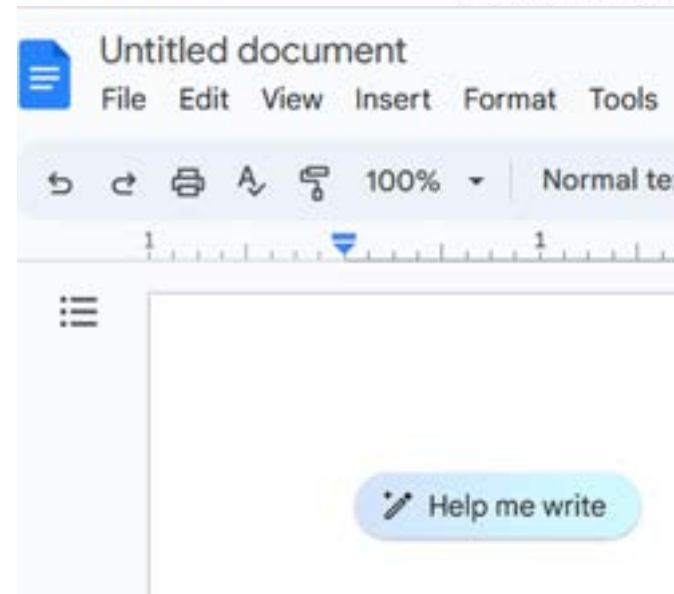
Structuring and scaffolding

- ▶ 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.



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’



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.

You're an instructional designer helping a teacher with distributed practice of core concepts in their course. I built up distributed practice. Your goal is to find ways to weave in a concept previously learned in a course when the instructor is covering a new topic. Ask me what my new topic is and what concept previously covered I would like to integrate into the new topic. Once you have both my new topic and previous concept give me 4 different ways to incorporate the two so that students get practice reviewing a previous concept and connecting it to the new topic.

✓ Searching for distributed practice

✓ Generating answers for you.

Well, this is Bing, the place I could help you with distributed practice. According to Wikipedia¹, distributed practice is a learning strategy where practice is broken up into short sessions over a longer period of time. It can help students retain information better and connect previous concepts to new topics.

To help you with your instructional design, I need to know two things: what is your new topic and what concept previously covered do you want to integrate into it? Please reply with one topic and one concept per message.

Learn more: [1. distributed practice](#) [2. distributed practice](#) [3. distributed practice](#) [4. distributed practice](#) 1 of 10

The new topic is WWI and the previously covered topic is the enlightenment.

Thank you for your info. Here are four ideas to incorporate the concept of the enlightenment into the topic of WWI:

information. Based on your current topic (the thinkers of the Enlightenment), here are 4 ideas to topic:

ent ideas and the American Revolution: Discuss h Locke, Montesquieu, and Rousseau influenced velopment of the U.S. Constitution. You can also ommon Sense" in sparking the revolution. yze how the American Revolution was inspired ividual rights, and the social contract. You can

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

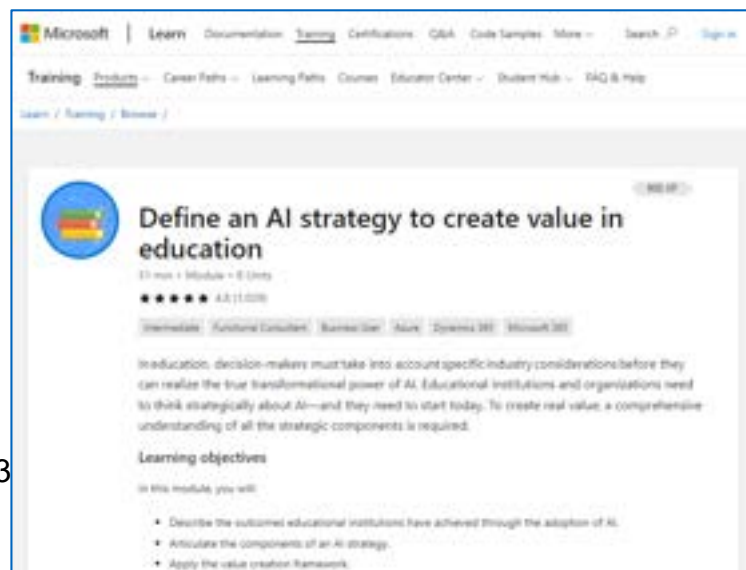
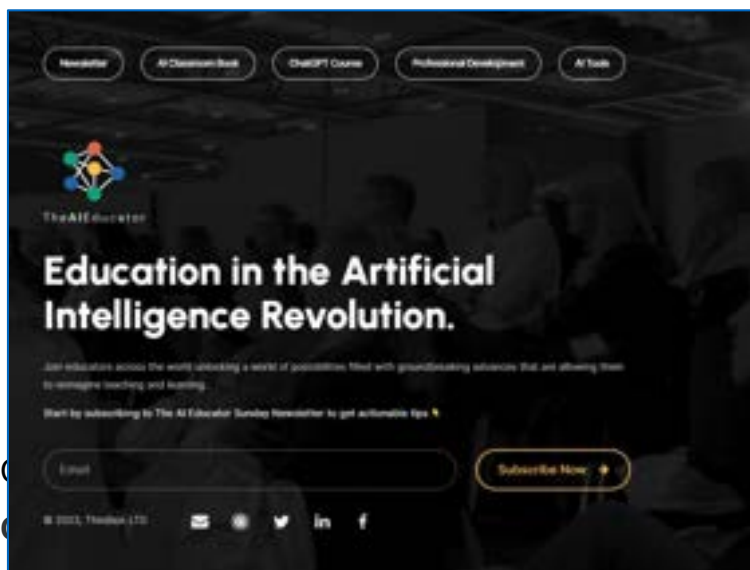
Abstract

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.

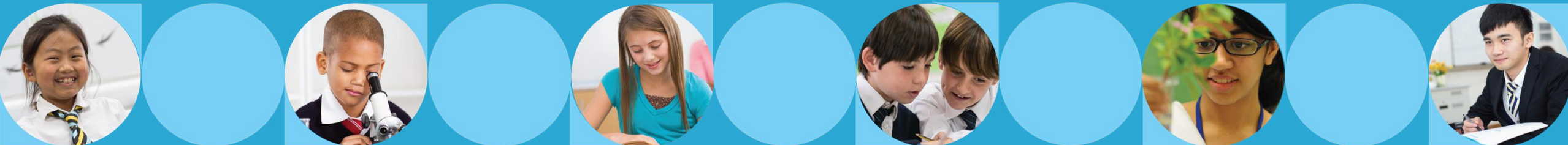
Keywords: AI, GPT4, ChatGPT, Learning

Suggested Citation:

Useful references for AI and education



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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