



CAMBRIDGE

# AI and knowledge

## Guiding students towards conscious use of AI

**Rob Linsdell and Sarah Hughes**

**With thanks to Silvia Pirola**

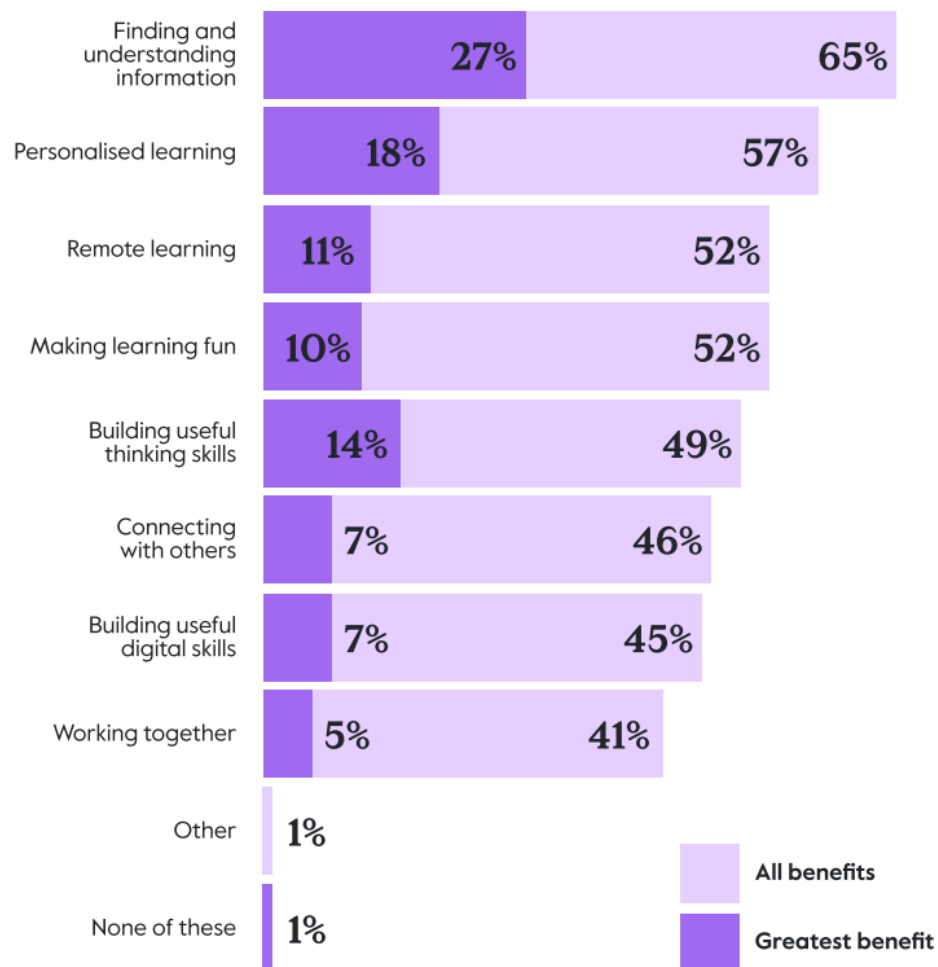
December 2025

# Agenda

1. How are learners using generative AI?
2. What is the cognitive impact of using generative AI?
3. What does this mean for classroom practice?

# How are students using generative AI?

# Student views of benefits of technology use

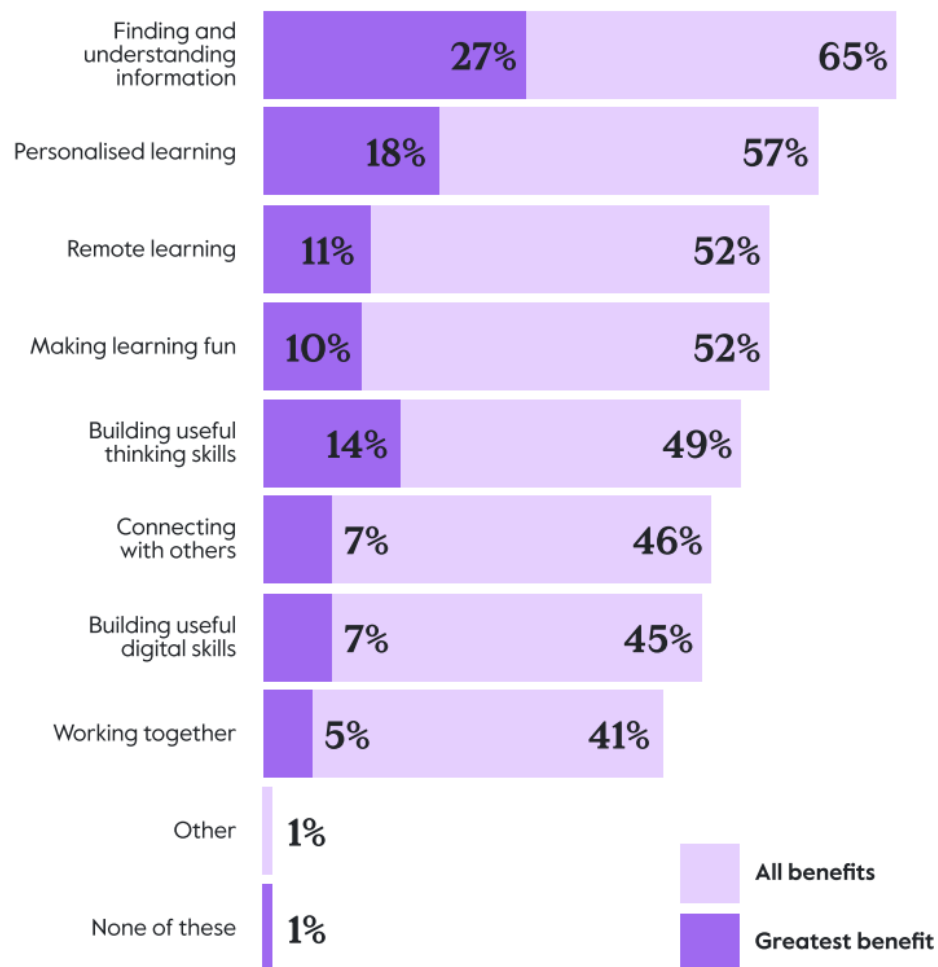


## Questions for students:

*Which of the following, if any, do you view as benefits of technology in preparing you for the future?  
Please select all that apply.*

*And which of the following, if any, do you view as the greatest benefit of technology in preparing you for the future?  
Please select one option only.*

# Student view of the need for subject knowledge



“As AI gets more popular and more widely available the need to memorise subject knowledge becomes less important as we can find and implement subject knowledge easily with the help of AI.”

Student, India

# How students are currently using GenAI

**AI as a tutor**

**AI as a creative  
partner**

**AI as a writing  
assistant**

### **AI as a tutor**

Explore new topics  
and find sources for  
further research

Receive feedback and  
explanations

“AI tools are great to understand some topics  
and questions you don't understand.  
If I don't understand a question, I can ask this  
neural network to solve it for me and I can see  
"Oh, OK, this how it works", or I can discuss  
any topics with it.  
I use AI on a daily basis, literally for any goals.”  
Student, Serbia

### AI as a tutor

Explore new topics  
and find sources for  
further research

Receive feedback and  
explanations

Create exam-style  
questions

Create a study plan

“ When I was about to give my AS exams,  
I shared all my information to ChatGPT regarding  
subjects, my current study level and how many  
hours I have to study, so it made me a timetable to  
study each subject, regarding managing the time  
of each subject before my coming exams.

It really helped me a lot.”

Student, Pakistan



### **AI as a creative partner**

Find inspiration for project work

Explore new topics

Create presentations

“ I do know a few people that use AI in a good way, such as they take just inspirations from it and they change it into their own type of words and into their own type of way.

By just taking that inspiration, they can create a whole new topic from their own mind that that information give them. ”

Student, UAE

### **AI as a writing assistant**

Spelling and grammar checks

Write essays

Create presentations

“Younger people in school, they don't really know the balance or the limit between using technology to do research and using technology to produce their content. I've seen some examples where children just use ChatGPT to make their own presentation.

That is the wrong way to use this kind of AI tool, because it shouldn't replace your work. If you only use this tool to make it for you, then you're not really learning the skill.”

Student, Thailand

### **AI as a writing assistant**

Spelling and grammar checks

Write essays

Create presentations

“You could write in a prompt such as 'write me an essay about airplanes' and give them a set amount of lines or a set amount of sentences, and also tell them to paraphrase it such as a 12th grader and 11th grader or even a 13th grader and then AI will instantly do that basically [...] and students would typically just copy and paste the whole text that AI gives them.”

Student, UAE

# Activity

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# How are your students using generative AI?



# What is the cognitive impact of using generative AI?

# Generative AI Can Harm Learning

Hamsa Bastani,<sup>1\*</sup> Osbert Bastani,<sup>2\*</sup> Alp Sungu,<sup>1\*†</sup>  
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Learning: Opportunities and

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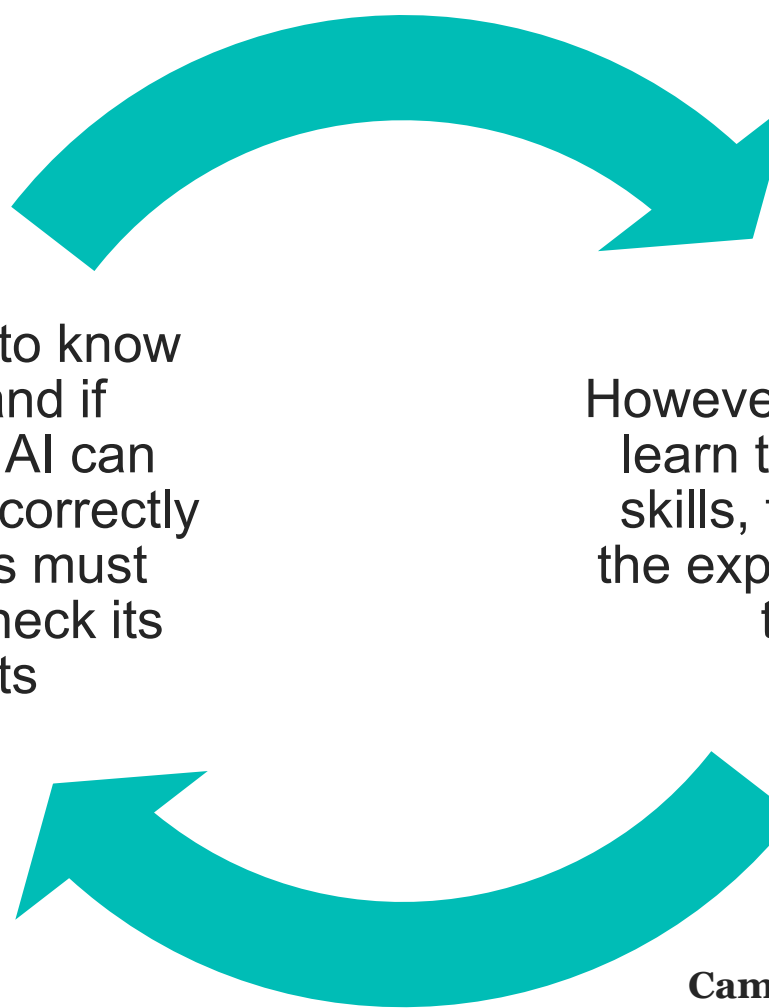
“Generative artificial intelligence is increasingly being integrated into education, where it can boost learners’ performance. However, these uses do not promote the deep cognitive and metacognitive processing that are required for high-quality learning.”

Yan, Greiff, Lodge & Gašević (2025)

# The risk of GenAI use



# Longer term risk of GenAI use



It is difficult to know  
beforehand if  
generative AI can  
solve a task correctly  
so learners must  
vigilantly check its  
outputs

However, if they do not  
learn the underlying  
skills, they may lack  
the expertise required  
to do so

# Different uses of AI result in different cognitive impacts

## **AI as a tutor**

Scaffolding  
Enhanced  
metacognition

## **AI as a creative partner**

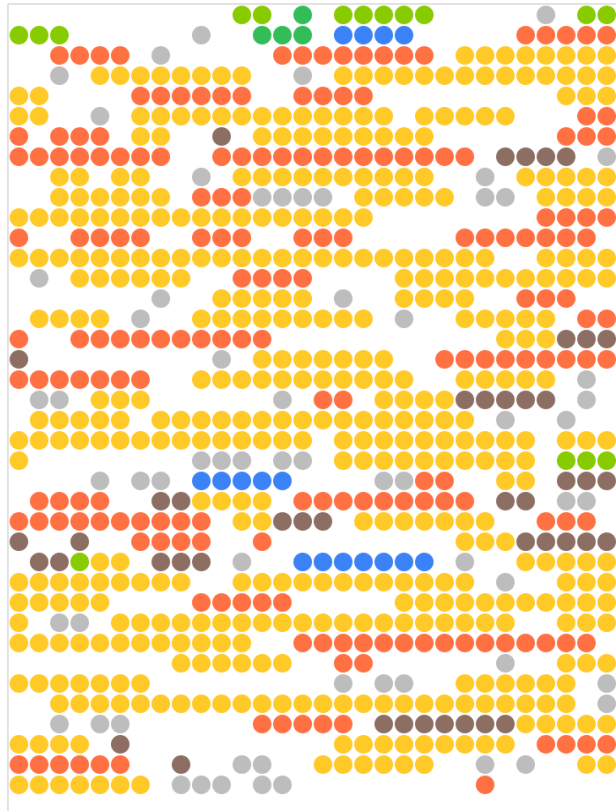
Idea generation  
Boosting divergent  
thinking

## **AI as a writing assistant**

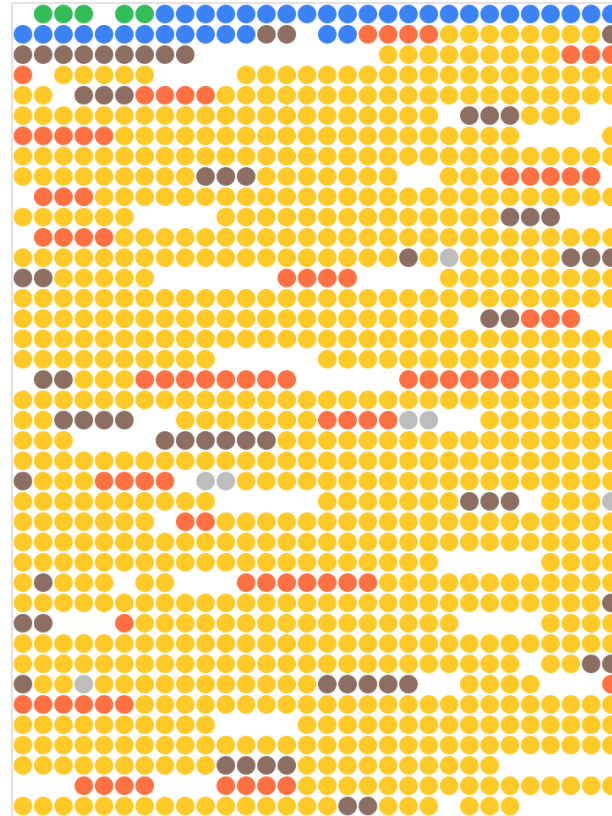
Reduced cognitive  
load  
Risk of shallow  
processing

# Human tutor vs ChatGPT vs AI tutor

Human Tutor



ChatGPT



AI tutor...?



# Retention and comprehension of learning using GenAI

Compared to LLM alone:

- Note-taking was more effective and more cognitively demanding. It led to a poorer learning experience.
- LLM + Notes was more effective and more cognitively demanding. It led to a better learning experience.
- Greater learning potential with greater cognitive engagement (Grund et al., 2024).
- Note-taking as a **desirable difficulty** (Bjork & Bjork, 2011).

Computers in Education (in press)

# Discussion

Compared to LLM alone:

- Note-taking was more effective and more cognitively demanding. It led to a poorer learning experience.
- LLM + Notes was more effective and more cognitively demanding. It led to a better learning experience.
- Greater learning potential with greater cognitive engagement (Grund et al., 2024).
- Note-taking as a **desirable difficulty** (Bjork & Bjork, 2011).
  - Students typically do not recognise their helpfulness (Bjork & Bjork, 2011; Baars et al., 2020).
  - Students tend to avoid these (Biwer et al., 2020; Bjork et al., 2013).

# ResearchMatters / 37

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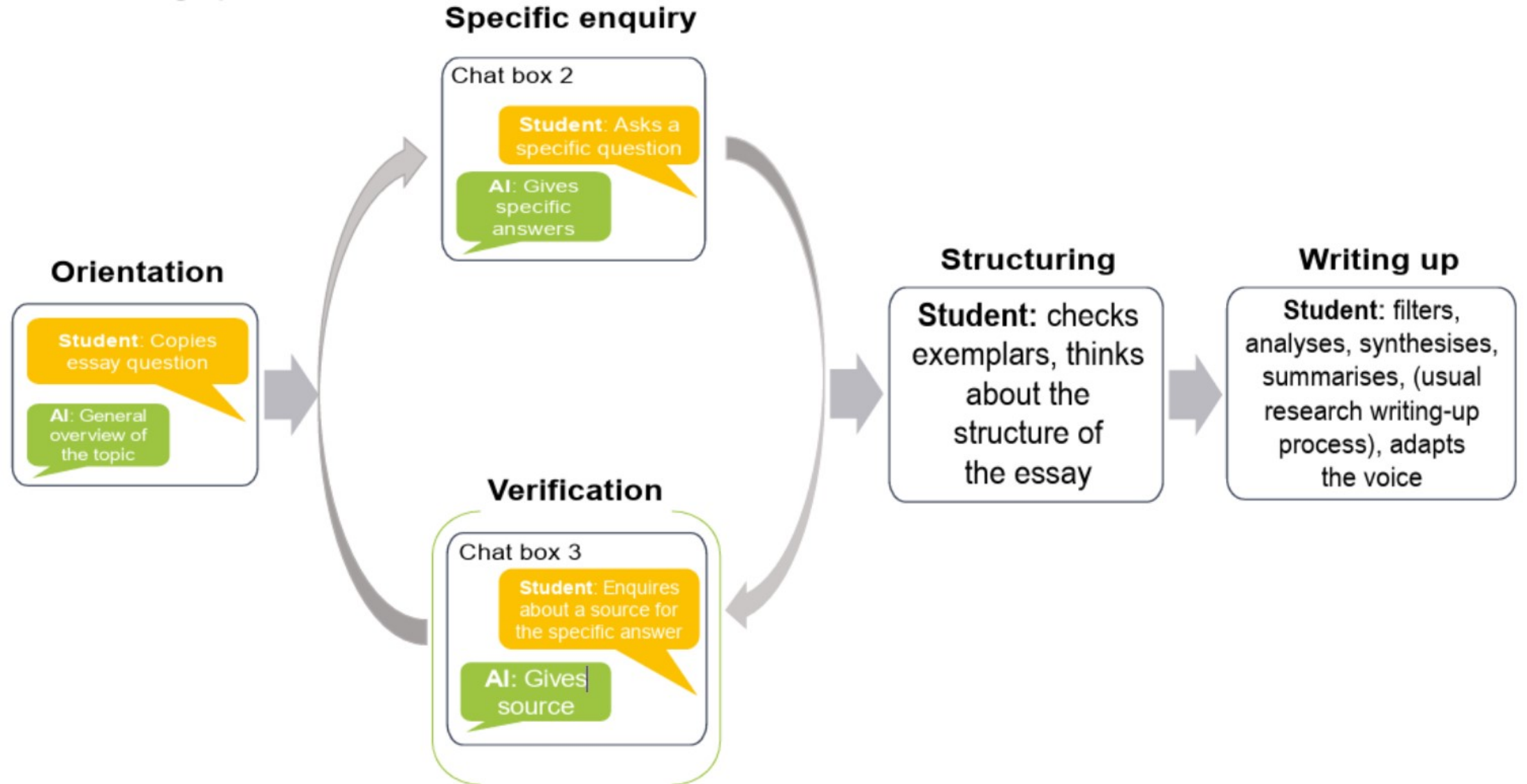
Journal homepage: <https://www.cambridgeassessment.org.uk/our-research/all-published-resources/research-matters/>

## Does ChatGPT make the grade?

**Jude Brady** (International Education Research Hub), **Martina Kuvalja** (Digital Assessment and Evaluation), **Alison Rodrigues** (International Education Research Hub) **and Sarah Hughes** (Digital Assessment and Evaluation)



# How do students use ChatGPT?



**AI as a tutor**

**AI as a creative partner**

**AI as a writing assistant**

“...you can then apply your research skills and select and synthesise. You will get a very low mark just using ChatGPT. You can't just copy and paste. You'd need to have ... the skills developed ... but then I feel like those skills are developed from not using a source like ChatGPT ... it's ... a paradox. ”

Student using ChatGPT, UK

“Generative artificial intelligence is increasingly being integrated into education, where it **can** boost learners’ performance. However, these uses do not promote the deep cognitive and metacognitive processing that are required for high-quality learning.”

Yan, Greiff, Lodge & Gašević (2025)

# Strategies for the effective use of GenAI in the classroom

Join at [menti.com](https://menti.com) | use code **7613 2849**

# How do you encourage the effective use of GenAI in the classroom?

All responses to your question will be shown here

Each response can be up to 200 characters long

Turn on voting to let participants vote for their favorites



Menti

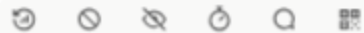
AI and Knowledge\_CSC



Choose a slide to present

How are your students using generative AI?

How do you encourage the effective use of GenAI in the classroom?



0/1

Join at [menti.com](https://menti.com) | use code 7613 2849

How do you encourage the effective use of GenAI in the classroom?



# Strategies for effective use of AI

**AI as a tutor**

**AI as a creative  
partner**

**AI as a writing  
assistant**

# Strategies for effective use of AI

## AI as a tutor

- Getting feedback
- Interrogating learning materials
- Summarising learning notes
- Asking them questions

## AI as a creative partner

- Orienting for new content
- Interrogating textbooks

## AI as a writing assistant

- Simplifying language
- Spelling and grammar check



# Writing good prompts for feedback

## Context

- I am a... and I want to...

## Task

- Your task is to...

## Detail

- Include... in your output

## Style

- The audience is....

## Refine

- Evaluate output and iterate

# Writing good prompts for feedback

## Context

- I am a student studying Cambridge A Level English General Paper. And I want some feedback on this essay.

## Task

- Your task is to give me feedback against these criteria...

## Detail

- Include how I can improve my essay against each of the criteria.

## Style

- I am 17 years old and English is my second language, keep this in mind when giving me feedback.

## Refine

- Evaluate output and iterate

# The Panel



“One effective strategy I use is “**AI reflection mapping**”, where students first generate an AI response to a question, then deconstruct it—highlighting strengths, weaknesses, and any misconceptions. They must support their critiques with evidence from textbooks or reliable sources.”

Science teacher

Mongolia

# The Panel



“I use several strategies to help my students use generative AI in ways that strengthen their thinking skills rather than replace them. [...] To prevent over-reliance, students must first attempt a question independently before using AI to compare, refine, or critique their work, ensuring AI acts as a feedback partner rather than completing the task for them.”

**Computing teacher**

Malaysia

# The Panel



“I encourage students to use AI as a brainstorming partner especially for outlining essays or exploring multiple perspectives on a topic. But I always emphasize the importance of verifying information and reflecting on how they arrived at their conclusion”

**Business and Mathematics teacher**

Pakistan

# Exit pass



I'm  
wondering  
about...



Will do ...  
differently



I saw ... from  
a different  
perspective

# Our *Futures of Learning* research



Lunchtime  
sessions –  
today and  
tomorrow



Share your  
views of how  
likely and  
impactful some  
disruptors of  
learning will be  
(online survey)




Outline your  
positive vision  
for the future of  
learning (online  
survey)



Join us at an  
online  
workshop in  
January


# Where to find out more



### How do teachers and learners collaborate in online schools?

In this research we worked with teachers and students in a variety of online classrooms to find out how collaborative learning worked.

[Read more](#)




### Cambridge International Education's guide to using AI in the classroom

Our guide to Getting Started with AI in the Classroom helps teachers explore the potential of AI to improve learning experiences and to encourage students to become more engaged and achieve better outcomes.

[Read more](#)


#### Research insights



#### New Cambridge research helps shape the future of assessment


This cross-Cambridge University research, led by the [Digital Education Futures Initiative](#), looks forward to 2050, not to predict the future of assessment, but to use Futures Thinking to anticipate plausible assessment futures.

[Read the report.](#)



#### Extended Reality in mathematics assessment

[We explore the potential of extended reality in mathematics assessments](#); as well as describing which mathematical topics that could effectively use XR we discuss the challenges to adoption of XR.



#### Handwriting and typing answers: what are the similarities and differences?

In this blog researcher Santi Lestari describes what we know about [the difference in the way learners answer questions that involve extended writing when they type and when they handwrite.](#)

[More research insights](#)

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<https://www.cambridgeassessment.org.uk/our-research/cambridge-digital-assessments/>



# Thank you!

**Cambridge Schools Conference, December 2025**  
Future-ready: preparing learners to thrive

# What does this mean?

- A conundrum.
- Possible trade-off between *effectiveness* and *propensity to engage*.
- LLM + Notes as a sensible compromise?

→ Integration of GenAI needs to be very carefully considered.

