Artificial Intelligence in education – friend or foe?

Communicating Cambridge’s Approach to Generative AI

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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*
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
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
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
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)
What challenges have our schools identified?

- Ensuring the quality and accuracy of generated content: 68%
- Inability to determine if AI has been used to support submitted assessments and coursework: 64%
- Pupils relying on generative AI sidelining effective learning: 49%
- Inequality in access to generative AI tools: 35%
- Lack of necessary skills and knowledge to use generative AI effectively: 28%
- Protecting privacy and security of personal data: 22%
- Exposure to harmful online content: 14%
- Discriminatory bias in education materials: 12%
- Possibility of students using AI to augment their performance on digital assessments: 9%
- None of these/unsure: 1%
Researching all 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

**Orientation**
- Chat box 1: Student: Copy essay question
- AI: General overview of the topic

**Specific enquiry**
- Chat box 2: Student: Asks a specific question
- AI: Gives specific question

**Verification**
- Chat box 3: Student: Give me a source for the specific answer
- AI: Gives source

**Specific enquiry**
- Chat box 4: Student: Asks another specific question
- AI: Gives another specific answer

**Writing-up**
- Student: filters, analyses, synthesises, summarises, (usual research writing-up process), adapt the voice

**Structuring**
- Student: checks exemplars, thinks about the structure of the essay

**Specific enquiry**
- Chat box n...: Student...
- AI: 

**Verification**
- Chat box 5: Student: Give me a source for the specific answer
- AI: Gives source

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Cambridge Schools Conference, March 2024
Effective communication: from competence to confidence
Deepfakes and spurious sources

The Cambridge response

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.
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
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
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
It’s still learning and teaching…

Understanding the Impact on Teaching & Learning
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...

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

- Existing skills & expectations
- Academic rigour
- Source analysis
- Reliability, bias
- Critical and creative thinking skills
- Cambridge Global Perspectives
Huge opportunities with AI – more than a tool?

Generative AI in Photoshop

AI content generation
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
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

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 these 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 (Wilson, 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
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’
Cambridge Schools AI usage

- Using AI tools to teach pupils in its use
- Using AI tools to train teachers in its use
- Manage data and generate reports
- Generate model texts and questions
- Create quizzes and tests
- Using Gen AI created simulations
- Create personalised lesson plans
- Design research and revision notes
- Create personalised feedback for pupils
- 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!
Useful references for AI and education (1)
Useful references for AI and education (2)


The AI Educator - [https://theaieducator.io/](https://theaieducator.io/)

Microsoft Training – Define an AI strategy to create value in education

The Cambridge approach to generative AI and assessment

Cambridge International - Artificial intelligence and teaching, learning and assessment

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

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

https://www.herteductor.com/


https://alicekeeler.com/2023/03/09/100-prompts-for-teachers-to-ask-chatgpt/

https://edte.ch/blog/2023/01/22/create-framework/?v=3a1ed7090bfa

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


Structuring and Scaffolding
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)

Assigning AI: Seven Approaches for Students, with Prompts (Molick and Molick)
Get in touch!

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