Generative AI and its Impact on Teaching, Learning & Assessment

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Creating a positive environment for academic success

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

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
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
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)
Understanding the Impact on Assessment

Researching all of the way around the concept
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?
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
- Chat box n...
- Student: checks exemplars, thinks about the structure of the essay
- AI:...

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

Cambridge Schools Conference, Orlando, 23-24 June 2023
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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

Cambridge’s Response to AI in Assessment
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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

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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
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…

<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>

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
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
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’
Useful references for AI and education
Thank you
Any questions?
Your feedback

- Please let us know your views on this session

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