人工智慧如何改變教育

2:35-2:50 March 8

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生成 AI (GenAI)

- 生成文字、圖像或其他媒體。
- 了解輸入資料的模式和結構，然後產生具有相似特徵的新數據

ChatGPT

POE

Bing AI

生成 AI 的應用

- File processing
- Work optimization
- Email Assistant
- Job interview writing tools
- Text to speech
- PPT generation
- Image generation
- Video generation
- Brand generation
- Animation generation
- Chatbot search engine
- Program development
- Translation tools
- Academic Research
- ……

生成式人工智慧對教育的影響

拒絕→政策→採納

Descriptive statistics

Questions	Secondary School (300 students)	Higher education (80 students)
Did your teachers introduce GenAI tools?	57%	15%
Have you tried GenAI tools?	67%	94%
Are you interested to use GenAI tools in your learning?#	4.2	4.8

Questions	Secondary School (260 teachers)	
Have you tried GenAI tools?	73%	
Are you interested to learn how to use GenAI tools in your teaching?#	4.7	
Will you use GenAI tools in teaching? #	4.3	
Do you think GenAI change school education?	4.4	

How about parents?

likert scale 1 – strongly disagree; 5 - strongly agree; all the schools received a talk on AI in education
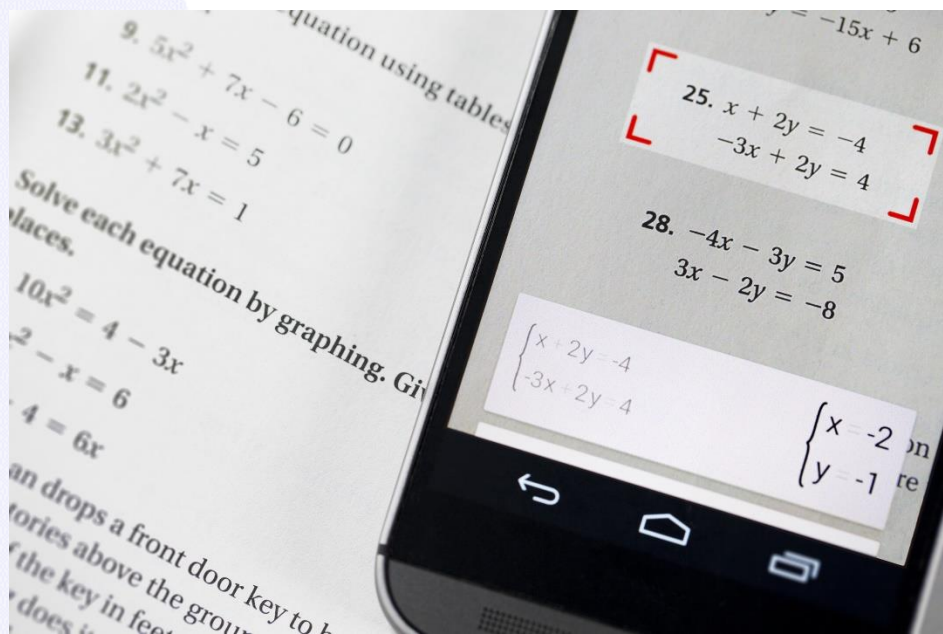
我**8**歲兒子的國語學習之旅

我不具備擔任國語老師的資格；

然而，生成 AI 讓我成為一個高效率的漢語助教.

你還要多長時間可以到？

photomath

真人解答
题目搜不到 老师免费答

拍照搜题
海量全题库 新题每日更

考点解析
知识点详解 难题轻松学

视频讲解
学而思名师 思路都听懂

Today

- **Chiu, T. K. F.** (2023). The impact of Generative AI (GenAI) on practices, policies and research direction in education: A case of ChatGPT and Midjourney, Interactive Learning Environments. https://dx.doi.org/10.1080/10494820.2023.2253861

- **Chiu T. K. F.** (2024). Chiu, T. K. (2023). Future research recommendations for transforming higher education with generative AI. Computers and Education: Artificial Intelligence, 100197.,

- Supported by QEF and RGC

Study 1 – school education

Research Question

- How do ChaGPT and Midjounery as GenAI impact school education in the four key educational domains – learning, teaching, assessment and administration – and learning outcomes, from the perspectives of teachers and leaders?

Participants and method

- 30 schools with different backgrounds in terms of students' academic ability

- Two to four teachers were recruited from each school, resulting in 88 teacher participants.

- Their ages ranged from 25 to 59 years old; 43 of them were female and 45 were male.

- Different subject teachers

- 39 of them were school leaders

- Survey → questions for focus groups → thematic analysis using the conceptual framework.

Results

Theme	Sub-theme	
Student learning	AI education	• AI competency.
	Critical reasoning and thinking	• Foundational learning. • Require solid disciplinary knowledge.
	Digital, media and information literacy	• Good technical and cognitive abilities to access, evaluate, create, and communicate needed information by utilizing digital media platforms for a task when accessing and learning with GenAI applications.
	Generic skills development	• GenAI enhanced teachers' beliefs about students' generic skills. These skills have become more important since the appearance of GenAI.

Results

Theme	Sub-theme	
Teacher learning	Teacher curriculum leadership	• The prerequisite knowledge for learning with GenAI includes AI literacy, critical thinking, and disciplinary knowledge; so, the whole school curriculum needs to be revised.
	Teacher AI literacy	• AI for all teachers.
	Teacher facilitating skills	• We need to change the way how we facilitate student learning or discussions. • We should enhance student questioning skills to learning with GenAI, instead of guiding students to complete subject-oriented tasks.
	Interdisciplinary teaching	• The responses from or prompt for GenAI are often presented in an interdisciplinary way. They provide answers that are driven from various resources. • I can do some tasks I cannot do before.

Results

Theme	Sub-theme	
Assessment	Teacher assessment literacy	• Traditional Homework is less important. • Innovative Homework is needed • Students can assess their generic skills and prerequisite knowledge anytime and anywhere by themselves.
	Dimensions of assessment	• The assessment for generic skills become more important than before.
Administration	Effective work with evidence	• We can complete routine and labour tasks faster and more effectively.
	Attitude of school administrative team	• We do not have related workshops for our administrative staff.

Implications

Implication for practice
Know-it-all attitude: Professional teacher programmes should promote learn-it-all, instead of know-it-all attitude, to improve teachers' facilitating skills and interdisciplinary teaching
New prerequisite knowledge: AI, digital, and media literacies, and critical thinking skills are the major prerequisite knowledge for learning with GenAI
Interdisciplinary teaching: To meet the needs of future education and workforce in the GenAI world, more interdisciplinary teaching is needed to break the boundaries of subject-oriented teaching, particularly in secondary schools

Implications

Implication for policy development
Assessment: • the assessment of prerequisite knowledge (such as critical thinking, disciplinary knowledge, inquiry-based questioning skills, and AI literacy) is needed to inform teachers if their students are ready to use GenAI in learning • generic skills should be assessed more often in classrooms.
AI education: AI education should be offered to all students and teachers
Professional standards for all school employees

When teachers design learning activities, students use ChatGPT to …

Learning activities	Forethought	Performance	Self-reflection
search information	X		
get examples	X		
check their answers			X
generate review questions to check for their understanding			X
create new problems for practice			X
create challenging problems			X
get insight into complex problems		X	
ask ideas for their improvement			X

When teachers design learning activities, students use ChatGPT to …

Learning activities	Forethought	Performance	Self-reflection
summarize their own work		X	
ask for definitions	X		
generate questions for discussions		X	
generate questions for essays		X	
get feedback for their work			X
practice peer feedback		X	
prepare for tough conversations		X	
visualize a problem		X	

When teachers design learning activities, students are expected to …

| Learning activities	Forethought	Performance	Self-reflection
anticipate ChatGPT's outputs			X
grade ChatGPT's outputs			X
debate with ChatGPT		X	

AI 會**CRAFT**我們教育的道路（預期轉變及影響）

- Care
  - 以人為本的教育 (human-centred education)
  - 學生需要關心他們的學習和同儕
- Reinforcement learning
  - 個人化學習 (material)
  - 個人化遊戲化學習 (avatar in virtual learning environments)
  - 個人化回饋
  - 持續性評估（Formative assessment）
- Assessment
  - 教師持續性評估能力的重要性
  - 學生的自評學習的重要性
  - 學校要評量什麼？
  - 幫助教師在學校進行更多的自主學習的活動

AI 會**CRAFT**我們教育的道路（預期轉變及影響）

- **F**uture skills and competencies
  - 重新定義未來教育的方向
  - 強調共通能力(創意，批判思維等) 的重要性
  - 懂得應用AI在自學及工作的能力
  - ＡＩ知識及素養（AI competency）
  - 其他的未來學習和職業生涯的能力 – fact checking, self-reflective mindset.
- **T**ransdisciplinary learning
  - 提供更多跨學科學習機會：幫助學生完成他們認為自己做不到的任務，例如，製作影片和圖片，
  - 促進STEAM
  - 音樂教育
  - 為學習提供不同的視角

ACE parents / teacher

- **A**wareness of AI knowledge and its impact (理解AI的風險和機遇)
  - 參加一些AI課程
  - 與其他家長/教師交流
  - Research mindset- 跟上AI知識
  - 多些實體(戶外)活動
- **C**ommunicate with their children (向孩子解釋AI的風險)
  - 用日常例子來解釋AI的風險
  - 例如，一些家長在社交媒體上傳了孩子的照片，而被其他用戶將照片用DEEP FAKE作不當用途 (色情、敲詐、脅迫)
- **E**xpectation of AI
  - 將AI視作一個教學助手（或導師助理），理解AI不是老師或導師，而是輔助的角色，真正的導師仍需家長/老師來擔任
  - 明白AI能力（**AI Competency**）將是未來學習和職業生涯的關鍵能力之一
  - ＡＩ在教學的限制
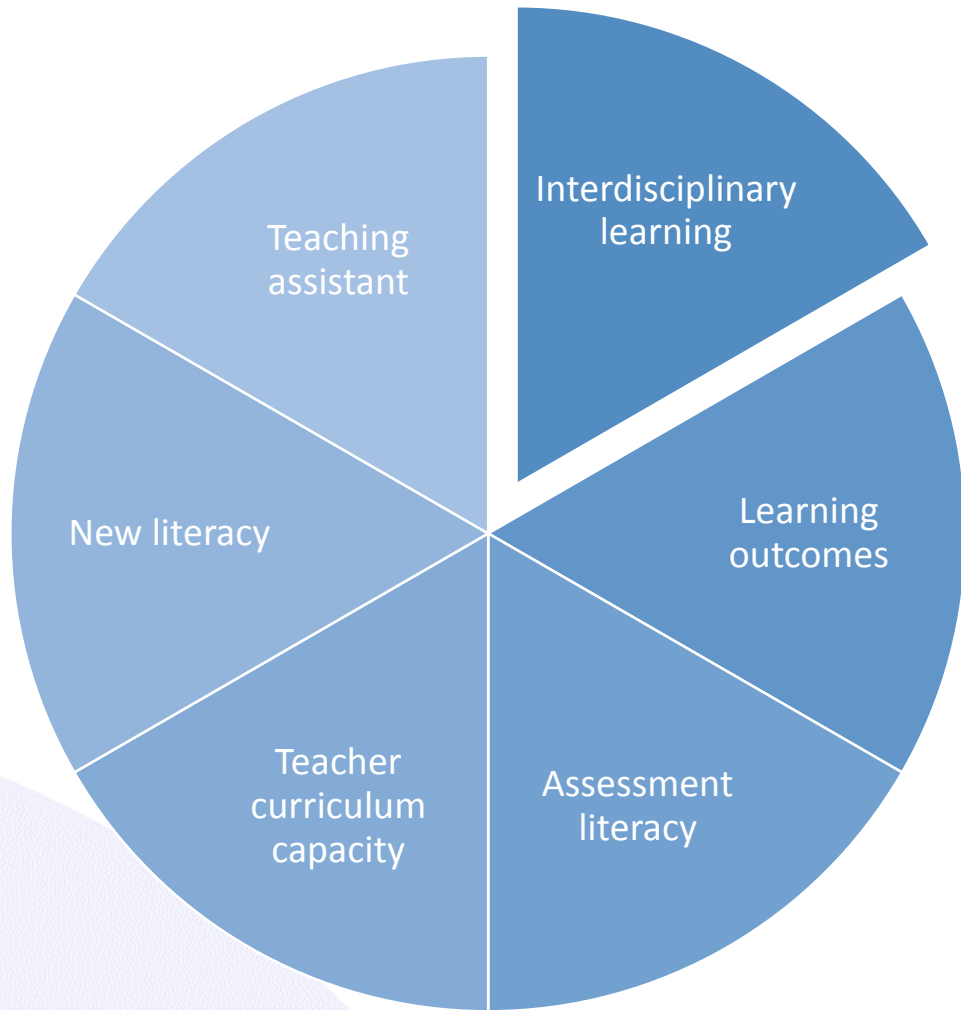
Dugga Digital Assessment: is an exam platform created together with teachers, students and administrators, funded by the Swedish Innovation Agency Vinnova. The assessment platform uses generative AI to help generate exams, quizzes and lessons to the benefit of teachers and students. It has been used by 500,000 students in 4,500 schools.
https://lnkd.in/e_PwWfCA

Quill's Reading for Evidence: a formative assessment tool that uses predictive AI to support the acquisition of literacy skills for students in grades 4 through 12. Since 2014, Quill has built more than 200 AI models to support Quill Reading for Evidence R&D. These fine-tuned models are trained using Google's open-source models. The tool has been used by 8 million students and 185790 teachers in 37,677 schools in 90 countries.
https://www.quill.org/

Class Saathi: developed by TagHive Inc. - a Samsung company, uses AI-powered Deep Knowledge Tracing (DKT) technology to help conduct formative learning assessment and provide immediate feedback. It has been tested for 167,878 students in 1,430 schools.
https://lnkd.in/eRy-_gcc

Spindle Speech AI: developed by iPortfolio (Korea) uses AI-driven Spindle Speech technology to help assess and enhance spoken English proficiency. It has been tested for approximately 4.5 million students globally and 500,000 students in South Korea across 112 schools.
https://lnkd.in/ec95BT6G

Smart Paper by Playpower Labs: uses computer vision algorithms and handwriting recognition models to grade paper worksheets for English, Hindi and Maths. It has been implemented in 65,000 schools for 4,700,000+ students and 237,000+ teachers, and was successfully deployed in Rajasthan government assessments, marking 4.5 million students in grades 3 to 8.
https://lnkd.in/ejbaYwpX

AI has made an impact on our society; Future of work will change.

Will we reform teaching and learning?

Thank You

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