

Generative AI for Teaching, Learning and Assessment

Opportunities and Issues

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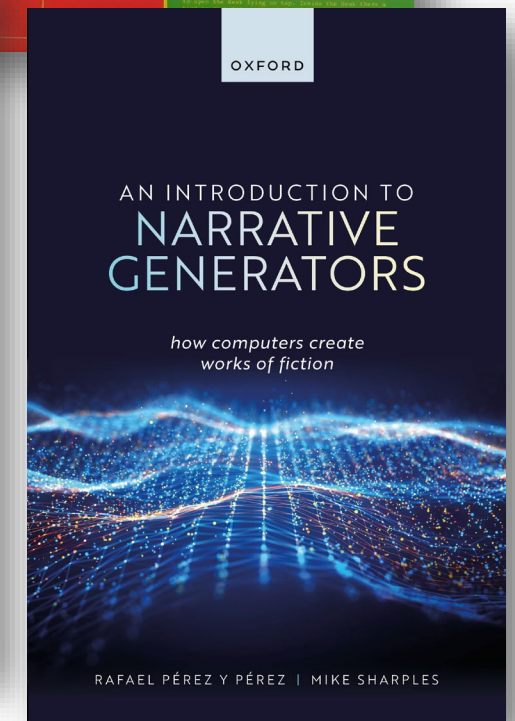
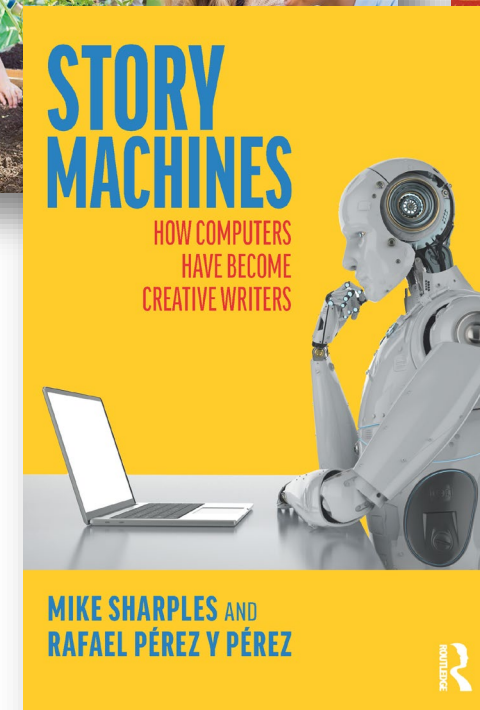
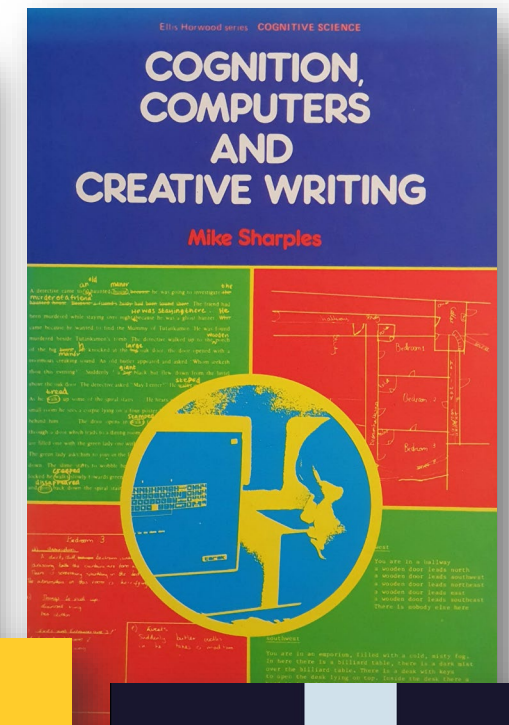
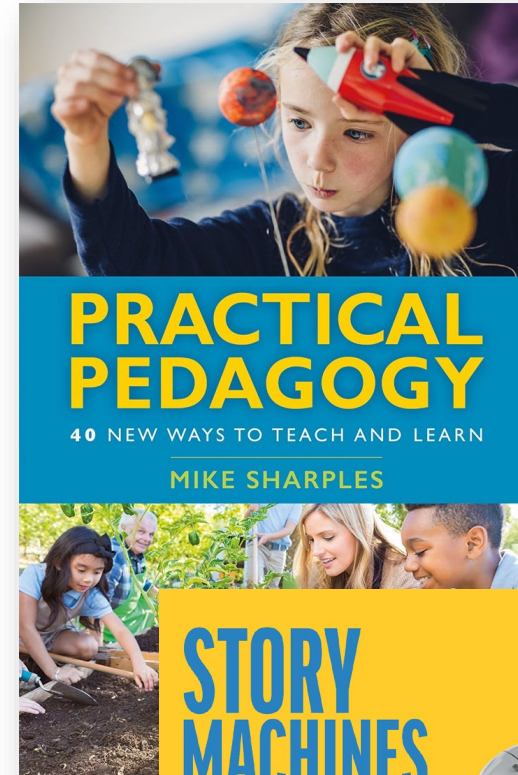
Emeritus Professor of Educational Technology
at The Open University

PhD in AI and creative writing from Edinburgh
University Department of Artificial Intelligence

Developed educational technology with BT,
Nokia, Kodak, Microsoft

Consultancy for schools, universities,
UNESCO, OECD

300 books and papers on educational
technology, cognitive science, AI and
education



1990s – Principal investigator on the MEDiate project to design and test an AI tutoring system for neuro-radiology based on a standardised image description language.



The screenshot displays the MEDiate Project software interface, which is divided into several functional areas:

- Target Image (4450):** Shows a brain MRI slice (SE3200 / 25,90 echo2 Transverse) with a scale from 0 to 63. It includes a 'Case History?' button and an 'Expert Desc?' button.
- Reference Image (4330):** Shows a corresponding brain MRI slice with a scale from 0 to 63. It also includes 'Expert Desc?' and 'Case History?' buttons.
- Feedback and Instructions:** A central text box states: "Correct. The lesion is visible in this set of images. Please indicate all major anatomical regions involved in the lesion itself." Below this are two small thumbnail images labeled 4469 / 1 and 4330 / 3.
- Visibility Menu:** A 'VISIBILITY' section contains a 'Lesion Visible' indicator and a 'LOCATION' menu. The menu lists anatomical regions: Cortical Grey Matter, Cerebral White Matter, Periventricular, Central Grey Nuclei, Intraventricular, Pituitary Fossa, Brainstem/Cerebellum, and Extracerebral. A 'MARGIN' button is also present.
- Lesion Map:** A large area on the right shows a brain slice with a green lesion outline and several blue circular markers. A crosshair is visible, and labels '4330' and '4469' are present.
- Navigation and UI Elements:** A 'browse' button and '1 of 1' indicator are at the bottom. A vertical sidebar on the right contains buttons for 'reset', 'Mag', 'help', 'Exit', 'G', 'M', and 'I'.

Types of artificial intelligence in education

Symbolic/ rule-based AI	Neural net/ machine learning AI
Models content, curriculum, teacher, learner	Learns from data
Knowledge-based tutoring	Learning analytics, language generation
Can inspect the internal representations	Flexible and general
Common-sense reasoning	Limited common-sense reasoning
Inflexible and limited	Bias and inaccuracies
	Can't inspect the internal representations
Hybrid neuro-symbolic systems combine symbolic AI and machine learning	

GPT-4

Neural net Large Language Model

Highly-trained text completer and style copier

It can generate up to 25,000 words

It can write in any style in multiple languages

It can be given a direct instruction

It can interpret text and images

It is a general-purpose language tool

MI

explain string theory in 200 words for an 11-year-old child



String theory is an idea in science that says that everything in the universe is made up of tiny little strings that vibrate. These strings are so small that you can't see them even with a really powerful microscope.

Scientists think that these strings are what make up all the different particles in the universe. So instead of there being lots of different particles like quarks and lots of different forces like gravity, there are just strings that vibrate in different ways.

It's like how different vibrations of a string make different notes.

String theory doesn't know yet about the mysteries of the universe.

User

Answer question I.1.a. Think step-by-step.

I. Principe de la détection de rayonnement avec un bolomètre

Comme illustré sur la figure 1 un bolomètre est constitué d'un absorbeur qui reçoit le rayonnement que l'on désire détecter. Sa température T , supposée uniforme, est mesurée à l'aide d'un thermomètre incorporé, constitué d'un matériau conducteur dont la résistance $R(T)$ varie avec la température T ; cette variation est caractérisée par le coefficient $\alpha = \frac{1}{R} \frac{dR}{dT}$. L'ensemble possède la capacité thermique C_{th} .

Un barreau, conducteur thermique, homogène, de longueur L , de section S et de conductivité thermique λ et sans échanges thermiques latéraux, relie le bolomètre à un thermostat de température T_b fixe.

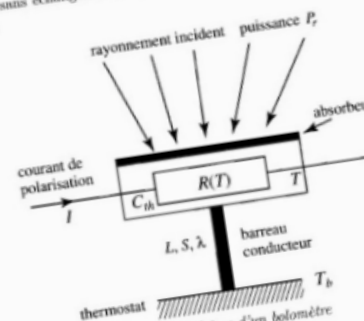


Figure 1 - Schéma d'un bolomètre

I.1. Dans cette première partie, on étudie le comportement du bolomètre en régime stationnaire, à la température de fonctionnement $T = T_b$.

I.1.a) Exprimer la température $T(x)$ en tout point du barreau conducteur repéré par son abscisse x ; on prendra $T(0) = T_b$ et $T(L) = T_b$.

GPT-4

To answer question I.1.a, we need to express the temperature $T(x)$ in every point of the conductive bar, which is characterized by the abscissa x . We are given that $T(0) = T_b$ and $T(L) = T_b$.

For a stationary regime, the heat equation for the one-dimensional heat conduction in the bar is:

$$d^2T/dx^2 = 0$$

Integrating once, we get:

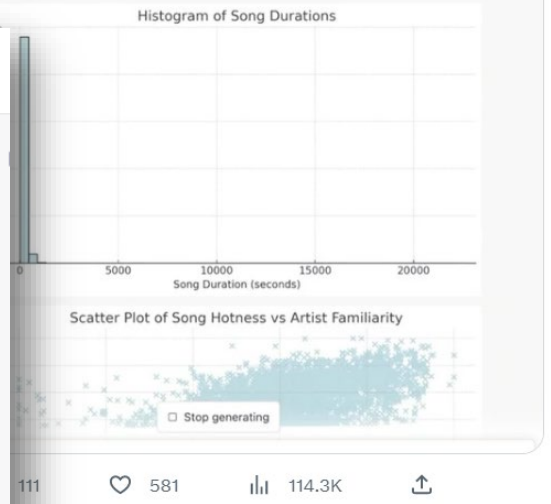
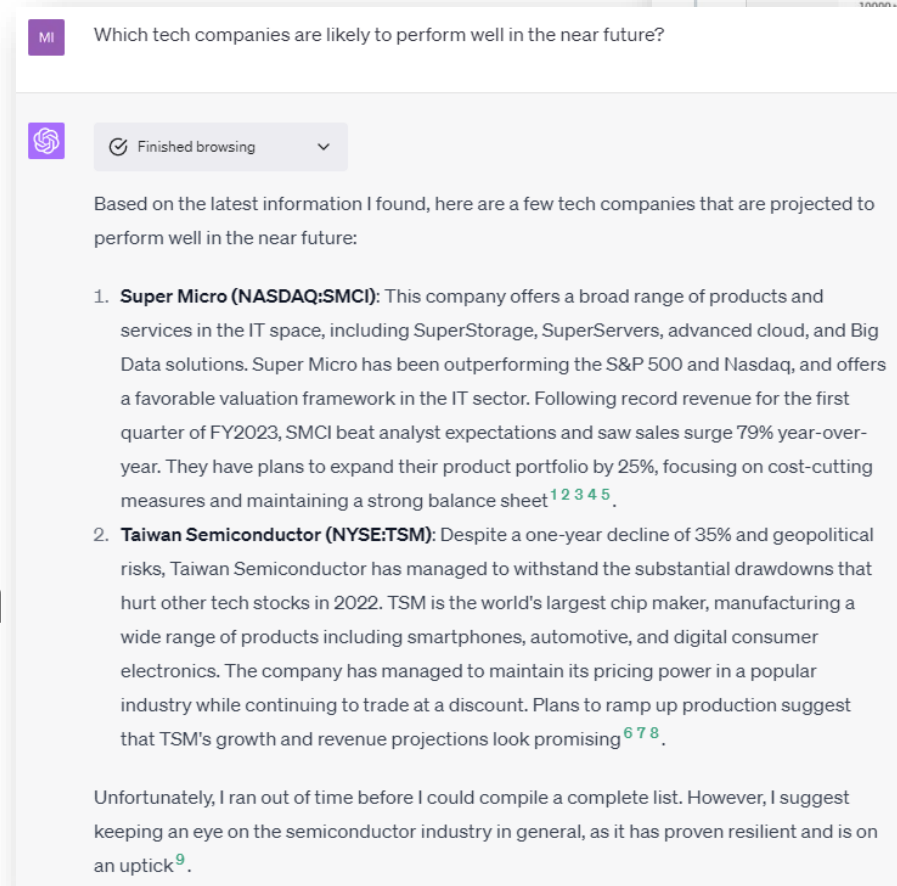
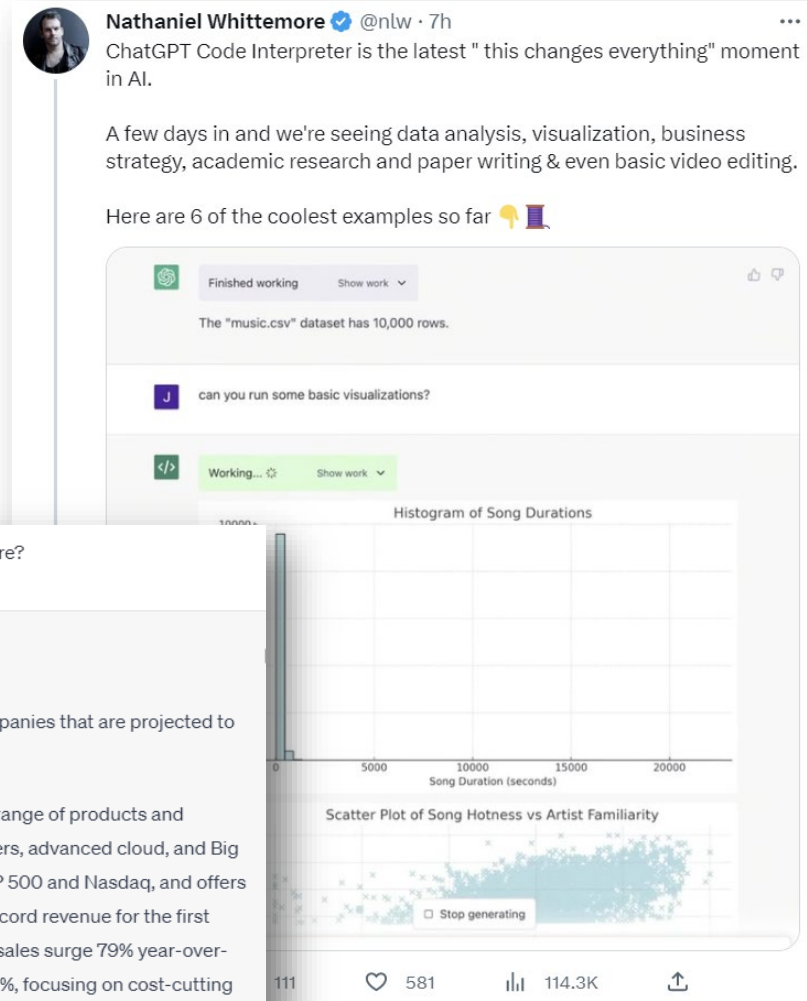
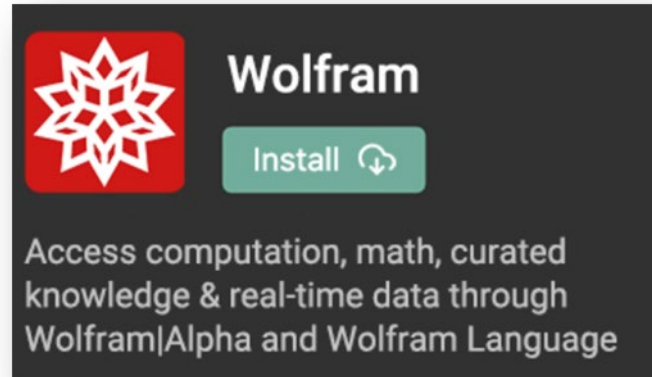
$$dT/dx = C_1$$

ChatGPT Plus

Plugins for maths, science, language, media, business

Integration with web browser

Code interpreter to run and display Python programs



Other AI generators

Language models

PaLM 2 from Google – over 100 languages, version for medicine, free with Bard chat

LLaMA 2 from Meta – open source, 20 languages, small, simple, free, efficient

Claude-2 from Anthropic – trained on ethical principles, can read 75,000 words, free to use

Image generators

DALL-E 2 from OpenAI – fast, accurate, free with Bing Image Creator

Midjourney – high-quality photo images

Stable Diffusion – free, open source

Plus: computer code, voice, music, video, specialist (e.g., BloombergGPT)



Generative AI hallucinates

It doesn't "know" it shouldn't invent research studies,

it has no explicit model of how the world works,

and is amoral.


It is a language model, *not* a database or reasoning system


Limitations

Despite making significant progress, our InstructGPT models are far from fully aligned or fully safe; they still generate toxic or biased outputs, make up facts, and generate sexual and violent content without explicit prompting. But the safety of a machine learning system depends not only on the behavior of the underlying models, but also on how these models are deployed. To support the safety of our API, we will continue to review potential applications before they go live, provide content filters for detecting unsafe completions, and monitor for misuse.

<https://openai.com/blog/instruction-following/>

You are a student on a Master of Education course. Write a high quality 500 word essay on "A Critique of Learning Styles". The essay should include academic references and evidence from research studies. It should begin "The construct of 'learning styles' is problematic because"

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 The construct of 'learning styles' is problematic because it assumes that learners have distinct and consistent preferences for acquiring and processing information. This idea has gained popularity among educators and trainers, but there is little evidence to support the existence of such a fixed and reliable construct. Furthermore, promoting the use of learning styles in education may lead to harmful practices and prevent learners from developing skills and abilities that are essential for success in the 21st century.

One of the main issues with the concept of learning styles is the lack of empirical evidence to support it. A systematic review of studies investigating the relationship between learning styles and academic achievement found little to no evidence of a correlation between the two (Pashler et al., 2008). In fact, the review concluded that teaching according to learning styles might actually be detrimental to learning outcomes. Similarly, a recent meta-analysis of studies exploring the effectiveness of learning styles interventions also found little support for the idea (Rohrer & Pashler, 2012). The lack of empirical support for the concept of learning styles undermines the notion that individuals have consistent and reliable preferences for acquiring and processing information.

Another problem with the use of learning styles in education is that it may encourage fixed mindsets and discourage the development of essential skills and abilities. According to the theory of growth mindsets, learners who believe that their intelligence and abilities are malleable are more likely to embrace challenges, persist in the face of setbacks, and ultimately achieve higher levels of success (Dweck, 2006). In contrast, the use of learning styles may encourage learners to see their abilities as fixed and unchangeable, leading to a belief that they are limited in their capacity to learn in certain ways. This can be particularly damaging for learners who may not have been exposed to certain ways of learning or who may have been discouraged from pursuing certain subjects or activities due to their perceived learning style.

Finally, the use of learning styles in education may lead to harmful practices such as tracking

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Finally, the use of learning styles in education may lead to harmful practices such as tracking and labeling students. In tracking, learners are sorted into groups based on their perceived learning style, which can reinforce stereotypes and limit opportunities for growth and exploration (Gurung, 2004). Labeling students according to their learning style can also be harmful, as it may encourage teachers and learners to focus on weaknesses rather than strengths and may stigmatize learners who do not fit neatly into a particular category.

In conclusion, the construct of learning styles is problematic because it lacks empirical support, may discourage the development of essential skills and abilities, and can lead to harmful educational practices such as tracking and labeling. As educators, it is important to recognize the limitations of learning styles and instead focus on evidence-based practices that promote learning and growth for all learners, regardless of their perceived learning style.

References:

Dweck, C. (2006). *Mindset: The new psychology of success*. Random House.

Gurung, R. (2004). Black and white thinking about learning styles: A response to the Journal of College Reading and Learning. *Journal of College Reading and Learning*, 34(2), 7-17.

Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2008). Learning styles: Concepts and evidence. *Psychological Science in the Public Interest*, 9(3), 105-119.

Rohrer, D., & Pashler, H. (2012). Learning styles: Where's the evidence? *Medical Education*, 46(7), 634-635.

A Critique of Learning Styles

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**Invented
research
study**

**Fake
academic
paper**

The construct of 'learning styles' is problematic because it implies a static and narrowly defined approach to the way individuals process information. Despite the widespread popularity of this concept, there is a lack of empirical evidence to support the effectiveness of learning styles in enhancing educational outcomes. This section explores the concept of learning styles theory by examining its origin, research evidence, and implications for educators.

The concept of learning styles has its roots in the work of Dunn and Dunn (1978), who posited that students have different preferred ways of processing information, including visual, auditory, reading/writing, and kinesthetic modalities. The VARK model (Fleming, 2001) expanded upon this idea, adding the reading/writing preference as a fourth category. Other models, such as Kolb's (Kolb, 1984) and Gardner's theory of multiple intelligences (Gardner, 1983), further contributed to the proliferation of learning styles theories in education.

Despite the intuitive appeal of these theories, numerous research studies have consistently failed to support the effectiveness of learning styles in improving educational outcomes. For instance, a meta-analysis conducted by Pashler et al. (2008) found insufficient evidence to support the idea that tailoring instruction to students' learning styles resulted in improved learning. Similarly, a review by Coffield et al. (2004) identified more than 70 learning styles models and concluded that there was little scientific evidence to support the use of any of them in practice.

One of the primary criticisms of learning styles is the lack of a clear and consistent definition of what constitutes a learning style (Coffield et al., 2004). This has led to the proliferation of multiple, often contradictory, models that make it difficult to operationalize and test the theory. Furthermore, many of the assessments used to determine students' learning styles have been found to lack reliability and validity (Kirschner & van Merriënboer, 2013), further casting doubt on the utility of this concept in educational settings.

Another issue with learning styles is the oversimplification of the learning process. By categorizing students into distinct learning styles, the theory disregards the complex and dynamic nature of human cognition (Kirschner & van Merriënboer, 2013). In reality, learners are not limited to a single mode of processing information, and the effectiveness of a particular learning approach may vary depending on the context and the specific task at hand (Willingham, 2009).

Moreover, the focus on learning styles may inadvertently encourage teachers to limit their instructional methods, potentially hindering the development of a diverse repertoire of cognitive skills in students (Riener & Willingham, 2010). Instead of catering to specific learning styles, researchers have argued that teachers should emphasize the use of evidence-based instructional strategies that are effective across a wide range of learners, such as spaced repetition, retrieval practice, and elaboration (Dunlosky et al., 2013).

In conclusion, the concept of learning styles is problematic due to its lack of empirical support, inconsistent definitions, and oversimplification of the learning process. Rather than relying on this flawed theory, educators should focus on adopting evidence-based instructional strategies that promote learning for all students. Ultimately, fostering a diverse set of cognitive skills and flexible thinking will better prepare learners for the complex and dynamic challenges they will face in their lives.

References:

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- Riener, C., & Willingham, D. (2010). The myth of learning styles. *Change: The Magazine of Higher Learning*, 42(5), 32-35.
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GPT-4 – March 2023

Plagiarism detectors don't work – the text is generated, not copied

AI detectors have low reliability

OpenAI's detector tool labels 9% of human-written text as written by AI

Turnitin AI detector

Claims of less than 1% false positives with GPT-3.5 (“based on data that was collected and verified in a controlled lab environment”) need to be independently verified.

<https://www.turnitin.com/products/features/ai-writing-detection>

AI detectors are more likely to mis-classify the text of non-native English writers

<https://arxiv.org/pdf/2304.02819.pdf>

The screenshot shows the Turnitin AI detector interface for a document titled "The Goliath of the Sea" by Tessa Ruiz. The score is 85.3 / 100. A prominent feature is a box indicating that 8% of the text was generated by AI. Below this, there is a section for "AI writing percentage" which explains that the score is based on the amount of qualifying text within the submission that Turnitin's AI writing detection model determines was generated by AI. It also notes that low scores have a higher likelihood of false positives. There are "Back" and "Next" buttons. At the bottom, there are "Educator resources for AI writing" and a "Show Disclaimer" link.

Turnitin detector tool

GPT detectors are biased against non-native English writers

Weixin Liang^{1*}, Mert Yuksekgonul^{1*}, Yining Mao^{2*}, Eric Wu^{2*}, and James Zou^{1,2,3,+}

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+these authors contributed equally to this work

ABSTRACT

The rapid adoption of generative language models has brought about substantial advancements in digital communication, while simultaneously raising concerns regarding the potential misuse of AI-generated content. Although numerous detection methods have been proposed to differentiate between AI and human-generated content, the fairness and robustness of these detectors remain underexplored. In this study, we evaluate the performance of several widely-used GPT detectors using writing samples from native and non-native English writers. Our findings reveal that these detectors consistently misclassify non-native English writing samples as AI-generated, whereas native writing samples are accurately identified. Furthermore, we demonstrate that simple prompting strategies can not only mitigate this bias but also effectively bypass GPT detectors, suggesting that GPT detectors may unintentionally penalize writers with constrained linguistic expressions. Our results call for a broader conversation about the ethical implications of deploying ChatGPT content detectors and caution against their use in evaluative or educational settings, particularly when they may inadvertently penalize or exclude non-native English speakers from the global discourse.

<https://arxiv.org/pdf/2304.02819.pdf>

Ban

Confident students will continue to use AI and will challenge decisions based on AI detectors.

Evade

Invigilated exams are costly and limited.

Asking students to state when they use AI will become increasingly difficult

Adapt

Requires new methods of assessment, new policies and guidelines

Embrace

Involves a long process of building trust

Australian universities to return to 'pen and paper' exams after students caught using AI to write essays

Australia's leading universities say redesign of how students are assessed is 'critical' in the face of a revolution in computer-generated text

- Follow our Australia news live blog for the latest updates
- Get our morning and afternoon news emails, free app or daily news podcast

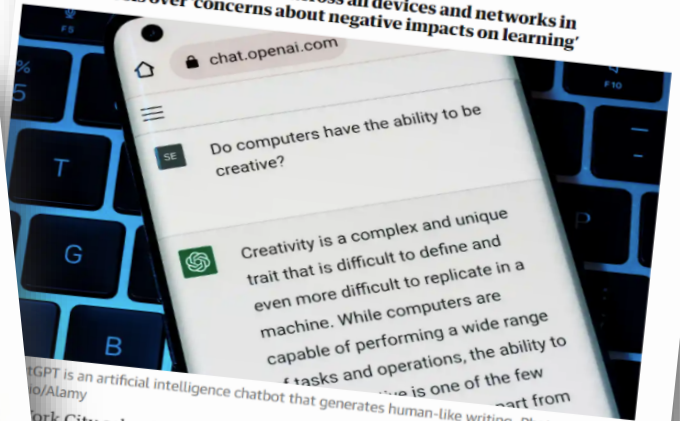


While some universities seek to deal with threats to academic integrity, one ex were fighting a losing battle to contain AI. Photograph: Jonathan Raa/NurPhoto/Australian universities have been forced to change the way they and other assessments amid fears students are using emerging AI intelligence software to write essays.

The Guardian, 10 January 2023

New York City schools ban AI chatbot that writes essays and answers prompts

ChatGPT tool will be forbidden across all devices and networks in public schools over 'concerns about negative impacts on learning'



ChatGPT is an artificial intelligence chatbot that generates human-like writing. Photograph: New York City schools have banned ChatGPT, the artificial intelligence that generates human-like writing including essays, amid fears that

The Guardian, 6 January 2023

ZDNET tomorrow belongs to those who embrace it today

Home / Innovation / Artificial Intelligence

Singapore open to ChatGPT use in schools, but urges caution

Schools are given "guidance and resources" to use artificial intelligence tools, including ChatGPT, to enhance learning, but students first must understand basic concepts and do not become over-reliant on technological tools, says education minister.



Written by Eileen Yu, Senior Contributing Editor on Feb. 6, 2023



Singapore supports the use of artificial intelligence (AI) tools such as ChatGPT in schools, but wants to ensure students do not become over-reliant on them and understand the limits of these technologies.

<https://www.zdnet.com/article/singapore-open-to-chatgpt-use-in-schools-but-urges-caution/>

Adapt: Assessment in the age of AI

Multimodal assignments

Base questions on images, video, or practical lab work

Multimodal answers – illustration, concept map, or storyboard in answer

Process-based assignments

Project work with staged assessment, plus reflective document

Authentic assessments where student apply knowledge and skills to plausible situations

Oral examination where misconduct suspected



Designing assessment for an AI-enabled world

Designing assessments for an AI-enabled world

This resource provides guidance on how to adapt assessment to better support learning. It also explores how to accommodate the required changes that might arise from the global use of generative AI.

On this page:

- [Some first steps](#)
- [Before you make changes](#)
- [Six changes you can make now](#): video guides to small-scale adaptations to current assessments, which can be integrated into current module descriptions
- [Plan for larger changes](#): an Assessment Menu for a more substantial revision of your assessment methods
- [Summary of key points](#).

This resource focusses on the pedagogical impact of AI on our assessment practices. It is designed to promote an environment of trust and responsibility with students through enhanced assessment practice and the fostering of a strong sense of academic integrity.

The suggestions, both in the short and longer term, are designed to enable students to understand and work effectively with the capabilities, limitations and ethical implications of

Case studies



[Generative AI and education futures](#)

7 August 2023



[Listening to students' perspectives on generative AI](#)

4 August 2023



[Monitoring student progression by assessing online discussion forum posts](#)

18 May 2022

Example: Neurology Module (BA)

Revised assessment task

Imagine you are working on a placement in a local residential home with persons with different neurological conditions that require long term care. You have been asked to introduce some new health initiatives to support residents in their overall wellness.

1. Before the exam

Research the wellness needs of service-users and what kinds of health initiatives are most appropriate to support their wellness at this time. Present this as a set of up to ten bullet points, with a list of sources. Prepare this in advance of the exam.

Example: Neurology Module (BA)

2. During the exam (open book or timed)

Using your research and (any authorised materials):

- **Prepare** a plan to implement three health initiatives, one each to support physical, social and occupational/vocational needs of the service user. (250 words for each initiative)
- **Present** in a table the principle benefits of the initiatives you are proposing, and any problems or pitfalls you envisage in implementing each of these. (550 words)
- **Provide** a rationale for the recommendations you are making, written in the form of an email for your busy line manager. (200 words)
- **Write a reflection** on what you have learned from this exercise. (500 words)

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Certainly! Here are ten bullet points on wellness needs of service-users with neurological conditions and the health initiatives that can support their overall wellness:

1. **Cognitive Stimulation:**
 - **Initiative:** Introduce cognitive therapy sessions and brain-training games to enhance memory, attention, and other cognitive functions.
 - **Source:** [National Institute on Aging](#)
2. **Physical Activity:**
 - **Initiative:** Organize regular physiotherapy sessions and gentle exercises like tai chi or yoga tailored for individuals with mobility issues.
 - **Source:** [National Institute of Neurological Disorders and Stroke](#)
3. **Nutritional Support:**
 - **Initiative:** Collaborate with dietitians to design meal plans that cater to the specific needs of individuals with neurological conditions.
 - **Source:** [American Academy of Neurology](#)
4. **Mental Health and Emotional Well-being:**
 - **Initiative:** Offer regular counseling sessions and group therapies to address emotional

Table of Benefits, Problems, and Pitfalls:

Initiative	Principal Benefits	Problems/Pitfalls
Physiotherapy Sessions	Improved mobility, Enhanced muscle strength, Reduced pain, Increased independence	Requires specialized staff, Potential for injuries, May not be suitable for all residents
Social Interaction Events	Reduced isolation, Enhanced emotional well-being, Strengthened community bonds	Logistical challenges, Potential for conflicts, Some residents may feel overwhelmed
Skill Development Workshops	Boosted self-esteem, Cognitive stimulation, Sense of purpose, Vocational skills	Requires resources and staff, Residents may feel overwhelmed or have unrealistic expectations

Email to Line Manager:

Subject: Rationale for Proposed Health Initiatives

Dear [Manager's Name],

I hope this email finds you well. I've been working on introducing new health initiatives to support our residents, focusing on their physical, social, and occupational/vocational needs. The proposed initiatives are based on extensive research and aim to enhance the overall wellness of our residents.

Reflection:

This exercise has been an enlightening journey into the multifaceted needs of individuals with neurological conditions. While the primary focus often lies on medical care, it's evident that holistic well-being encompasses physical, social, and occupational/vocational aspects.

The research phase highlighted the importance of tailored interventions. One size doesn't fit all, especially in a setting with diverse needs. The planning phase required a balance between ambition and feasibility. While it's tempting to introduce numerous initiatives, it's crucial to ensure that each one is sustainable and beneficial.

The table exercise was particularly insightful. While it's easy to get caught up in the potential benefits of an initiative, considering the pitfalls ensures that we're prepared for challenges. This proactive approach can lead to better outcomes and fewer disappointments.

Drafting the email underscored the importance of clear communication, especially when seeking buy-in from stakeholders. It's essential to be concise, focused, and persuasive, highlighting the rationale behind each decision.

Overall, this exercise has reinforced the importance of holistic care in healthcare settings. It's not just about treating a condition but ensuring that individuals lead fulfilling, meaningful lives. It's a reminder that behind every diagnosis is a person with dreams, hopes, and a desire for connection and purpose.

Adapt: Emerging policy and strategy

Move to more **authentic practices and assessments**, such as project work

Establish guidelines for students and staff in use of generative AI

Reassure and support students in becoming AI literate and developing strategies for effective learning

Explain to students how they should **acknowledge use of generative AI** in assignments

Manage suspected breaches of guidelines

Sample Policy Statements about Text Generators

- ["Artificial Intelligence Policy in Secondary Schools"](#) by Leon Furze, including a template
- ["Considerations on wording when creating advice or policy on AI use"](#) by Michael Webb, February 14, 2023
- ["Association for Computational Linguistics \(ACL\) 2023 Policy on AI Writing Assistance"](#)
- ["Classroom Policies for AI Generative Tools."](#) curated by Lance Eaton
- ["Guidelines for the use of artificial intelligence in university courses"](#) by Juan David Gutiérrez, Universidad del Rosario, February 22, 2023
- ["Engaging with AI in your education and assessment."](#) UCL, February 2023
- ["Rules for Tools"](#) by Christian Spannagel, January 5, 2023
- ["A Note About AI \(ChatGPT and Other Tools\)"](#) by Whitney Gegg-Harrison
- ["Monash University Policy and Practice Guidance Around Acceptable and Responsible Use of AI Technologies"](#)
- ["Syllabus Resources"](#) from the Sentient Syllabus Project by Boris Steipe
- ["UCI Division of Teaching & Learning page on ChatGPT,"](#) including syllabi suggestions.
- ["Course Policies related to ChatGPT and other AI Tools"](#) by Joel Gladd, January 5, 2023
- ["Update Your Course Syllabus for ChatGPT"](#) by Ryan Watkins, *Medium.com*, December 18, 2022
- ["The rise of artificial intelligence software and potential risks for academic integrity: briefing paper for higher education providers."](#) QAA (Quality Assurance Agency for Higher Education in the UK), Jan 30, 2023
- ["AI Syllabus Language Heuristic"](#) by Lance Cummings, February 10, 2023

<https://tinyurl.com/y7z4fac4>

AI Text Generators: Sources to Stimulate Discussion Among Teachers,
compiled by Anna Mills

Adapt: Emerging policy and strategy

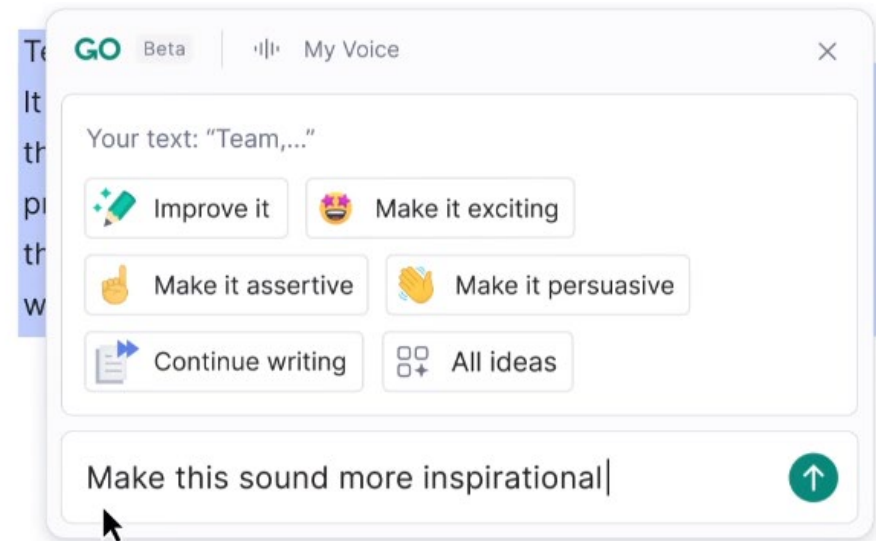
Move to more **authentic practices and assessments**, such as project work

Establish guidelines for students and staff in use of generative AI

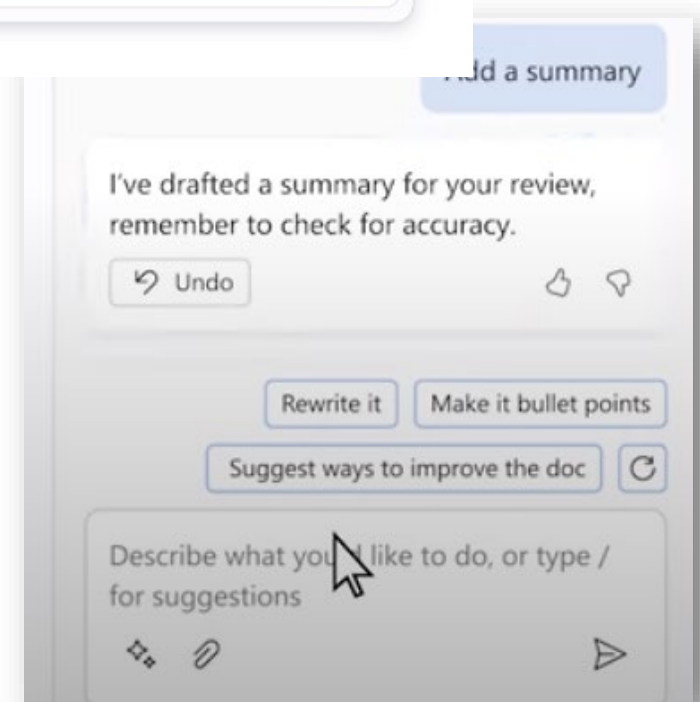
Reassure and support students in becoming AI literate and developing strategies for effective learning

Explain to students how they should **acknowledge use of generative AI** in assignments

Manage suspected breaches of guidelines



Grammarly



Microsoft 365 Copilot in Word

Flip the narrative from

“How will AI impact education?”

to

“What are new and effective ways to teach and learn with AI?”

Every powerful pedagogy could be augmented by AI

Adaptive teaching

Spaced learning

Personal inquiry

Dynamic assessment

Stealth assessment

Translanguaging

Crossover learning

Seamless learning

Incidental learning

Learning from gaming

Geo-learning

Learning through social media

Navigating post-truth societies

Explore first

Teachback

Learning through argumentation

Computational thinking

Learning from animations

Learning to learn

Assessment for learning

Formative analytics

Threshold concepts

Learning through storytelling

Learning in remote labs

Context-based learning

Event-based learning

Learning for the future

Embodied learning

Immersive learning

Maker culture

Bricolage

Massive open social learning

Crowd learning

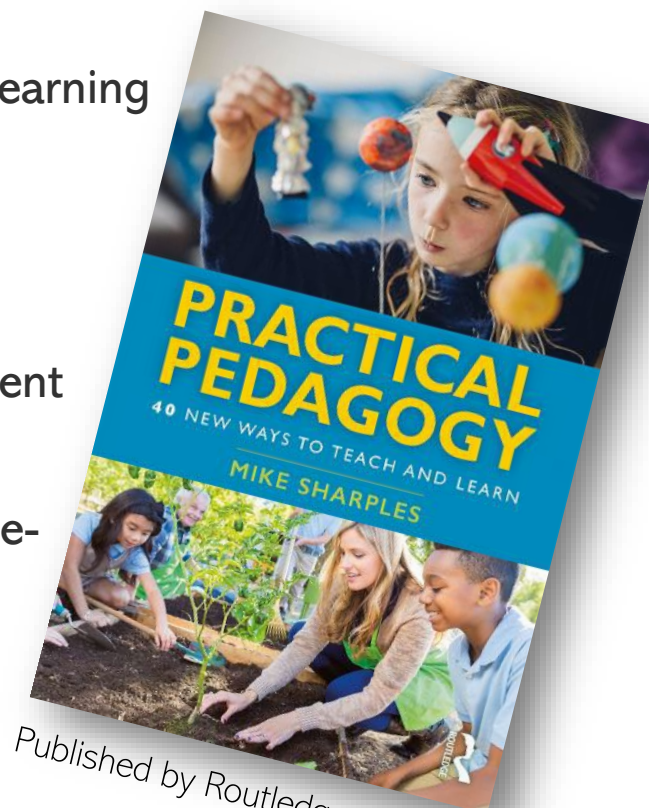
Citizen inquiry

Rhizomatic learning

Reputation management

Open pedagogy

Humanistic knowledge-building communities

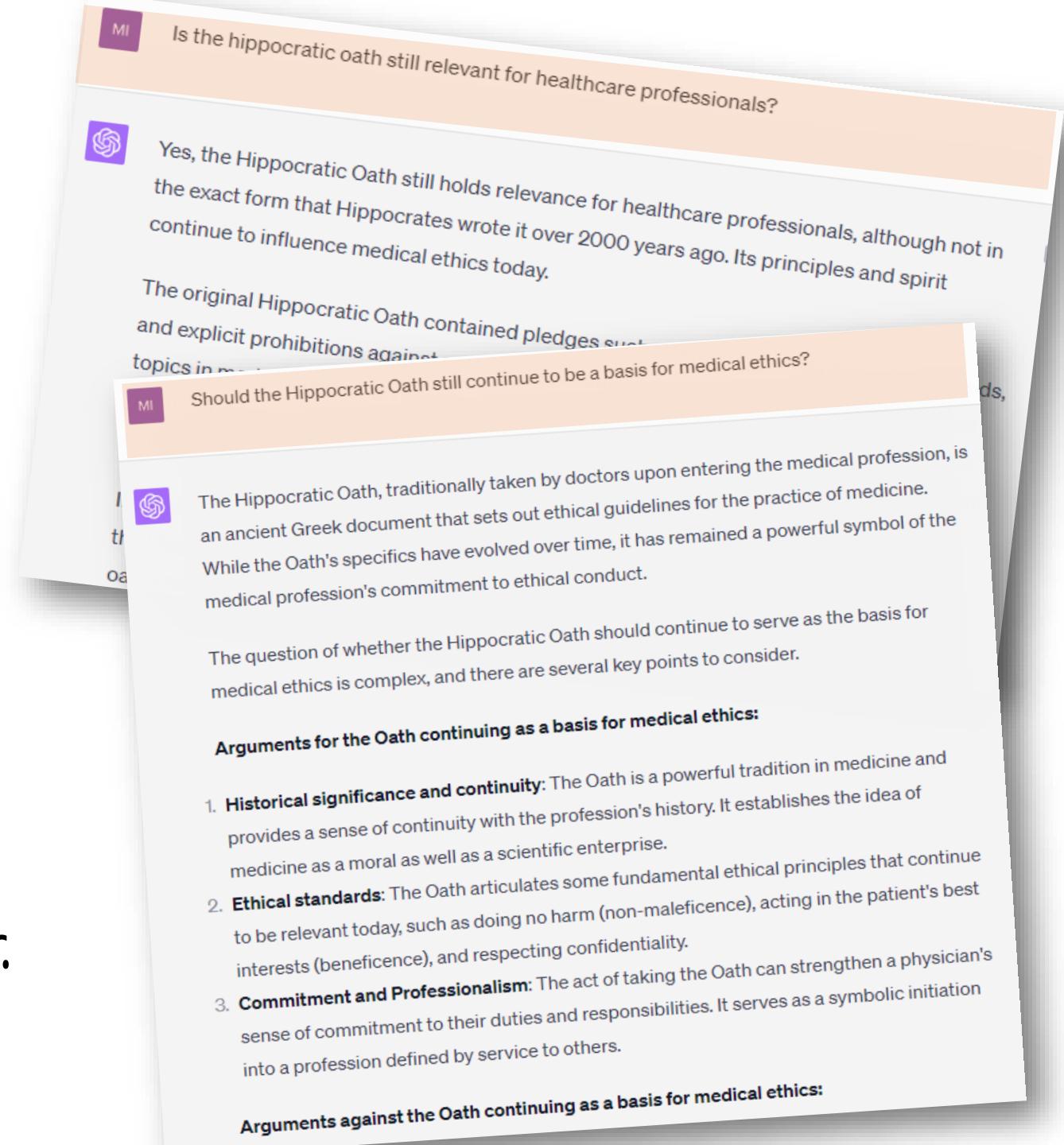


Published by Routledge, 2019

New ways of teaching, learning and assessment with AI

Possibility Engine

Educator or student uses AI to generate multiple responses to an open question. Each student synthesises and critiques the AI responses, to create their own written answer.



New ways of teaching, learning and assessment with AI

Socratic Opponent

In an individual or group activity, students engage with ChatGPT in a Socratic dialogue, then **each student writes an argumentative essay.**



New ways of teaching, learning and assessment with AI

Socratic Opponent

In an individual or group activity, students engage with ChatGPT in a Socratic dialogue, then each student writes an argumentative essay.

MI That suggests conflict can only be fruitful when the participants have been trained in how to handle it, or have developed a constructive culture. Is conflict only fruitful for the elite?

Not at all. The ability to handle conflict constructively is not exclusive to any particular group, and it's certainly not just for the "elite". Constructive conflict resolution skills can be learned and developed by anyone, regardless of their socio-economic status, educational level, or cultural background.

Conflict is a part of human nature and occurs in all spheres of life, from personal relationships to community interactions and workplaces. Having the tools to navigate these conflicts can be beneficial to everyone involved.

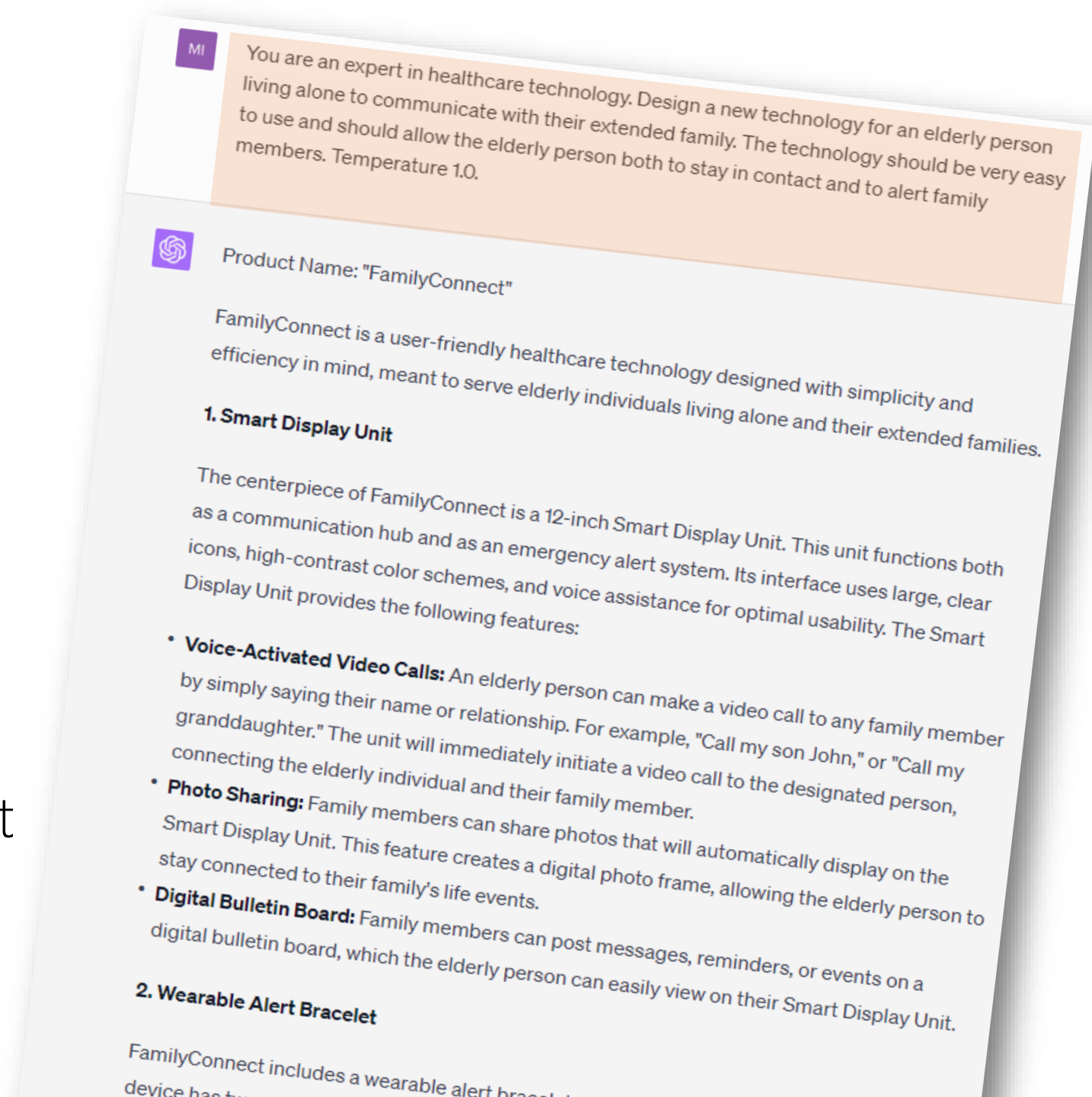
Here are a few ways in which various groups can benefit from conflict:

- 1. Personal Relationships:** Conflict can help to deepen understanding between friends, family members, and romantic partners. It allows people to express their needs and wants, understand each other's boundaries, and work towards a relationship that respects and satisfies everyone involved.
- 2. Communities:** In community settings, conflict can lead to improved policies and services. For example, a conflict about a local issue might result in community members coming together to demand better services from their local government, leading to improvements that benefit everyone in the community.
- 3. Workplaces:** Employees at all levels can benefit from conflict. It can lead to better understanding of colleagues' perspectives, improved team dynamics, and more effective and efficient work processes. It can also help to address power imbalances and improve fairness and equality in the workplace.
- 4. Schools:** Conflict in educational settings can be an opportunity for learning and growth for students, teachers, and parents alike. It can lead to improved policies, teaching methods, and learning environments, and can also provide students with valuable lessons in empathy, communication, and problem-solving.
- 5. Societal Level:** On a societal scale, conflict can be a catalyst for social change. Movements for civil rights, gender equality, and environmental justice have all arisen out of conflict and

New ways of teaching, learning and assessment with AI

Co-designer

Students, individually or as a group, use ChatGPT as an aid to brainstorm, plan and evaluate a design. Use the “temperature” setting to alter the randomness. Each student writes a critique of the design process and output.




New ways of teaching and learning with AI

Personal Tutor

Students have a personal tutor for any topic.

You are an expert tutor in English for academic purposes. I am an undergraduate student. I want you to tutor me in use of English for academic purposes. You should assume I have limited initial knowledge of academic written English. You should tutor step by step through a chat dialogue with me, continually assessing my current state of knowledge, asking one question at a time and adjusting your teaching to my response. When I ask, you should provide a summary of my current knowledge of English for academic purposes that I can give to my teacher. Is that clear?

MI You are an expert tutor in English for academic purposes. I am an undergraduate student. I want you to tutor me in use of English for academic purposes. You should assume I have limited initial knowledge of academic written English. You should tutor step by step through a chat dialogue with me, continually assessing my current state of knowledge, asking one question at a time and adjusting your teaching to my response. When I ask, you should provide a summary of my current knowledge of English for academic purposes that I can give to my teacher. Is that clear?


 Absolutely clear! Let's begin.

Step 1: Understanding the Basics of Academic English

Academic English is a more formal style of writing and speaking used in universities and scholarly publications. It's characterized by its precise language, clear structure, and the use of evidence to support arguments.

Question 1: Have you ever written an academic essay or paper before? If so, what was it about?

MI Yes, I have written an essay recently on "Ethical dilemmas in healthcare administration"

 Great! That's a solid start.

Step 2: Structure of an Academic Essay

An academic essay typically follows a structured format:

1. **Introduction:** Introduces the topic, provides some background, and presents the thesis statement.
2. **Body Paragraphs:** Each paragraph presents a single idea or argument, supported by evidence. It starts with a topic sentence, followed by evidence and analysis.
3. **Conclusion:** Summarizes the main points and restates the thesis in a new way.

New ways of teaching and learning with AI

Personal Tutor

Students have a personal tutor for any topic.

Question 2: In your essay on "Ethical dilemmas in healthcare administration," how did you structure your introduction? Can you briefly describe its components?

MI

I started by indicating why it is important to understand ethics when managing healthcare; Then I wrote some examples of ethical dilemmas. Then I ended by writing that it is a complex topic.



That's a good approach. Starting with the importance of the topic helps grab the reader's attention. Providing examples gives context, and acknowledging the complexity sets the stage for a deeper exploration in the body of the essay.

Step 3: Using Evidence in Academic Writing

In academic writing, it's crucial to support your claims with evidence. This can be in the form of data, research findings, quotations from experts, or examples from real-life situations.

Question 3: In the body of your essay, how did you support your points about ethical dilemmas in healthcare administration? Did you use any specific studies, quotes, or data?

New ways of teaching and learning with AI

Personal Tutor

Students have a personal tutor for any topic.

Practice Activity: Let's apply what you've learned. Imagine you read an article by an author named Jane Doe, published in 2021, in the "Journal of Healthcare Ethics." The article's title is "Ethical Considerations in Modern Medicine," and it spans pages 45-55.

Question 6: Can you try to format this source in APA style for the reference list?

MI Doe, Jane, 2021 Ethical consideration in Modern Medicine, Journal of Healthcare Ethics, 45-55.



You're on the right track! Let's refine it a bit to align perfectly with APA style:

1. The year of publication should come right after the author's name and be enclosed in parentheses.
2. The title of the article should be in sentence case (only the first word and proper nouns capitalized).
3. The volume number of the journal is missing. Let's assume it's volume 10 for this example.
4. The issue number can also be included in parentheses right after the volume number, but it's not provided here, so we'll skip it.
5. The page range should be preceded by "pp."

Here's the refined citation:

Doe, J. (2021). Ethical considerations in modern medicine. *Journal of Healthcare Ethics*, 10, pp. 45-55.

Remember, the title of the journal should be in italics.

New ways of teaching and learning with AI

Personal Tutor

Students have a personal tutor for any topic.

MI

But you said earlier that page references to journal articles don't have "pp."



You're absolutely right, and I apologize for the oversight. Thank you for pointing it out.

For journal articles in APA style, you don't use "pp." before the page numbers. So the correct citation should be:

Doe, J. (2021). Ethical considerations in modern medicine. *Journal of Healthcare Ethics*, 10, 45-55.

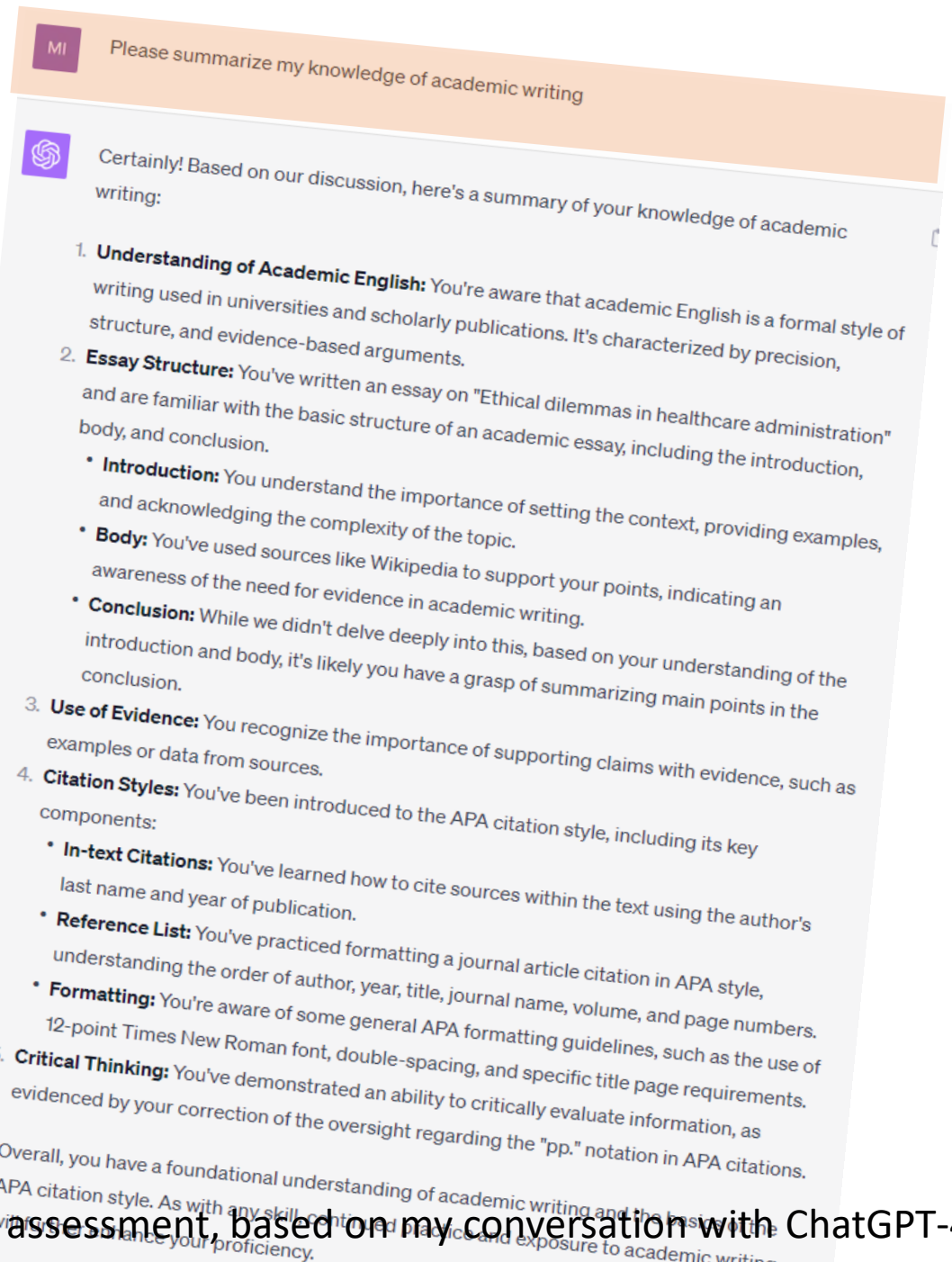
Thank you for catching that mistake, and I appreciate your attention to detail. Would you like to continue with another aspect of APA or academic writing, or do you have any other questions?

New ways of teaching and learning with AI

Dynamic Assessor

Students share summaries of their learning for dynamic assessment.

Summary assessment, based on my conversation with ChatGPT-4



New ways of teaching and learning with AI

Possibility Engine

AI generates alternative ways of expressing an idea

Socratic Opponent

AI acts as an opponent to develop an argument

Collaboration Coach

AI helps groups to research and solve problems together

Guide on the Side

AI acts a guide to navigate physical and conceptual spaces

Personal Tutor

AI tutors each student and gives immediate feedback on progress

Co-Designer

AI assists throughout the design process

Exploratorium

AI provides tools to play with, explore and interpret data

Study Buddy

AI helps the student reflect on learning material

Motivator

AI offers games and challenges to extend learning

Dynamic Assessor

AI provides educators with a profile of each student's current knowledge

Ethical AI

Russell Group principles

Limitations and ethical issues (precis)

Privacy and data considerations: Risks to privacy and intellectual property from information that users enter.

Potential for bias: Societal biases and stereotypes. Poorly referenced or incorrect sources. Unclear prompts may be misinterpreted by generative AI tools and produce incorrect, irrelevant or out-of-date information.

Copyright: There is a risk of copyright infringement, text or artwork may have been used in training the AI without the creator's consent.

Ethics codes: Ethics codes may not be embedded within the generative AI tool.

Exploitation: The process by which generative AI tools are built can present ethical issues. For example, some developers have outsourced data labelling to low-wage workers in poor conditions.

**RUSSELL
GROUP**

Russell Group principles on the use of generative AI tools in education

Our universities are committed to the ethical and responsible use of generative AI and to preparing our staff and students to be leaders in an increasingly AI-enabled world.

The rise of generative artificial intelligence (AI) has the potential for a profound impact on the ways in which we teach, learn, assess, and access education. Our universities wish to ensure that generative AI tools can be used for the benefit of students and staff – enhancing teaching practices and student learning experiences, ensuring students develop skills for the future within an ethical framework, and enabling educators to benefit from efficiencies to develop innovative methods of teaching.

Valuable work undertaken by organisations such as the Quality Assurance Agency for Higher Education (QAA) and Jisc has helped develop the sector's understanding of the opportunities and considerations of generative AI¹², and the Department for Education (DfE) has set out its position on the use of generative AI in the pre-university education sector³. Russell Group universities have contributed sector-wide insight and have been proactively working with experts to revise and develop policies that provide guidance to students and staff.

Collaboration, coordination, and consistency on this issue across the education and professional sectors – including professional bodies, schools, FE colleges and employers – will be crucial. In recognition of this, Russell Group universities have collectively developed the following principles that will guide the approach to generative AI tools across our universities and, we hope, beyond:

1. Universities will support students and staff to become AI-literate.
 2. Staff should be equipped to support students to use generative AI tools effectively and appropriately in their learning experience.
 3. Universities will adapt teaching and assessment to incorporate the ethical use of generative AI and support equal access.
 4. Universities will ensure academic rigour and integrity is upheld.
 5. Universities will work collaboratively to share best practice as the technology and its application in education evolves.
1. **Universities will support students and staff to become AI-literate.**
- 1.1 Generative AI tools are capable of processing vast amounts of information to generate responses but they have significant limitations. It is important that all students and staff understand the opportunities, limitations and ethical issues associated with the use of these tools and can apply what they have learned as the capabilities of generative AI develop. These include:
- (a) **Privacy and data considerations:** whether a generative AI tool is designed to learn directly from its users' inputs or not, there are risks to privacy and intellectual property associated with the information that students and staff may enter.
 - (b) **Potential for bias:** generative AI tools produce answers based on information generated by humans which may contain societal biases and stereotypes which, in-turn, may be replicated in the generative AI tool's response.

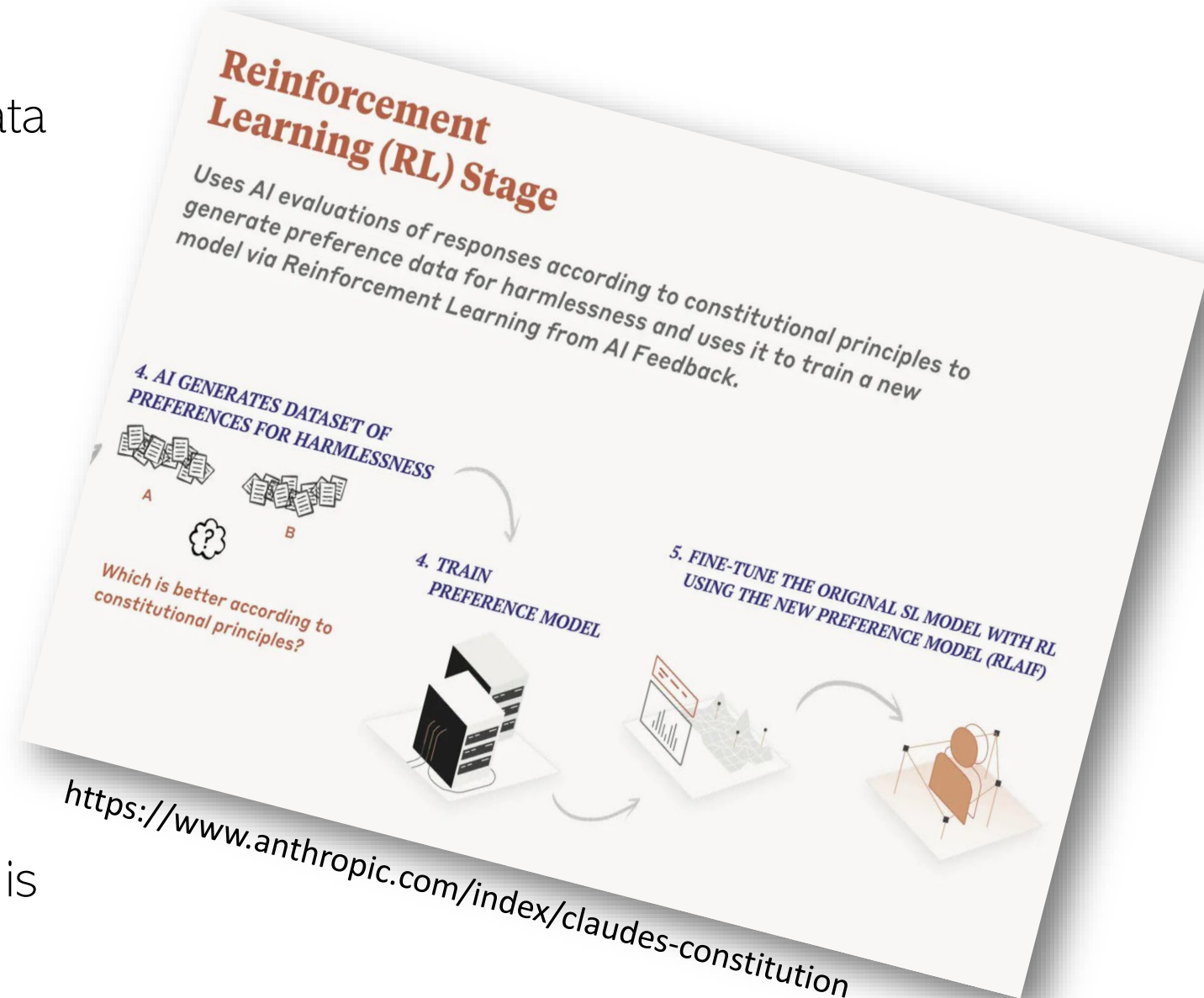
Claude 2 from Anthropic – “Constitutional” AI

Privacy and data considerations: data entered by users is not retained nor used for training the software.

Potential for bias: Fine-tuning with human feedback to reduce bias.

Ethics codes: Model is trained to respect high-level constitutional principles based on UN Declaration of Human Rights, and Apple’s Terms of Service,

e.g. “Please choose the response that is most supportive of life, liberty, and personal security”.



What next?

Beyond GPT

Microsoft Copilot

Generative AI integrated into Office suite

Google GEMINI

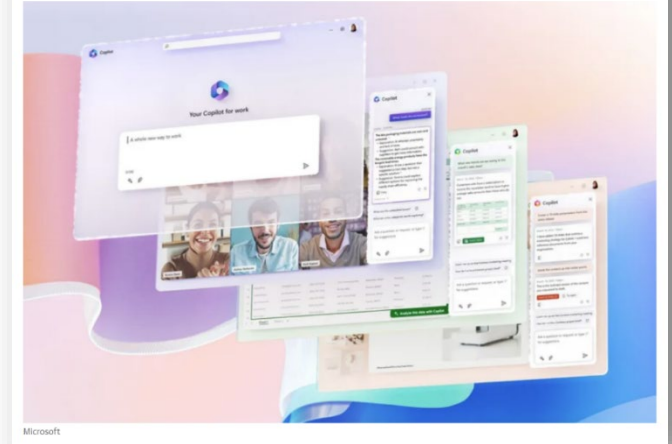
Collaboration with DeepMind, multimedia, problem-solving, networked

Social generative AI

AI driving social media and interactive entertainment

Microsoft 365 'Copilot' uses AI to automate everyday tasks in multiple apps

You can create PowerPoint presentations from Word docs, among other feats.



<https://www.engadget.com/microsoft-365-copilot-uses-ai-to-automate-everyday-tasks-in-multiple-apps-151133434.html>



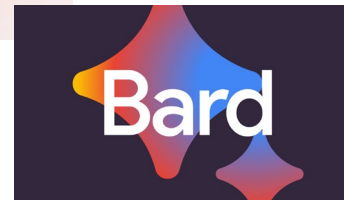
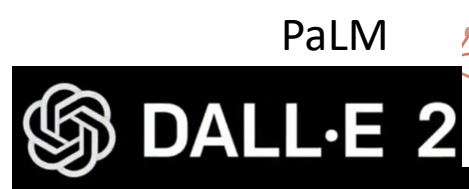
Foundation language models



Generative AI tools



Social AI systems for education, business, entertainment



Foundation language models



Generative AI tools



Social AI systems for
education, business,
entertainment

Education practitioners,
learning technologists and AI
companies need to work
together to adopt powerful,
and ethical systems for
personal and social learning



Use generative AI with care

Rethink written assessment

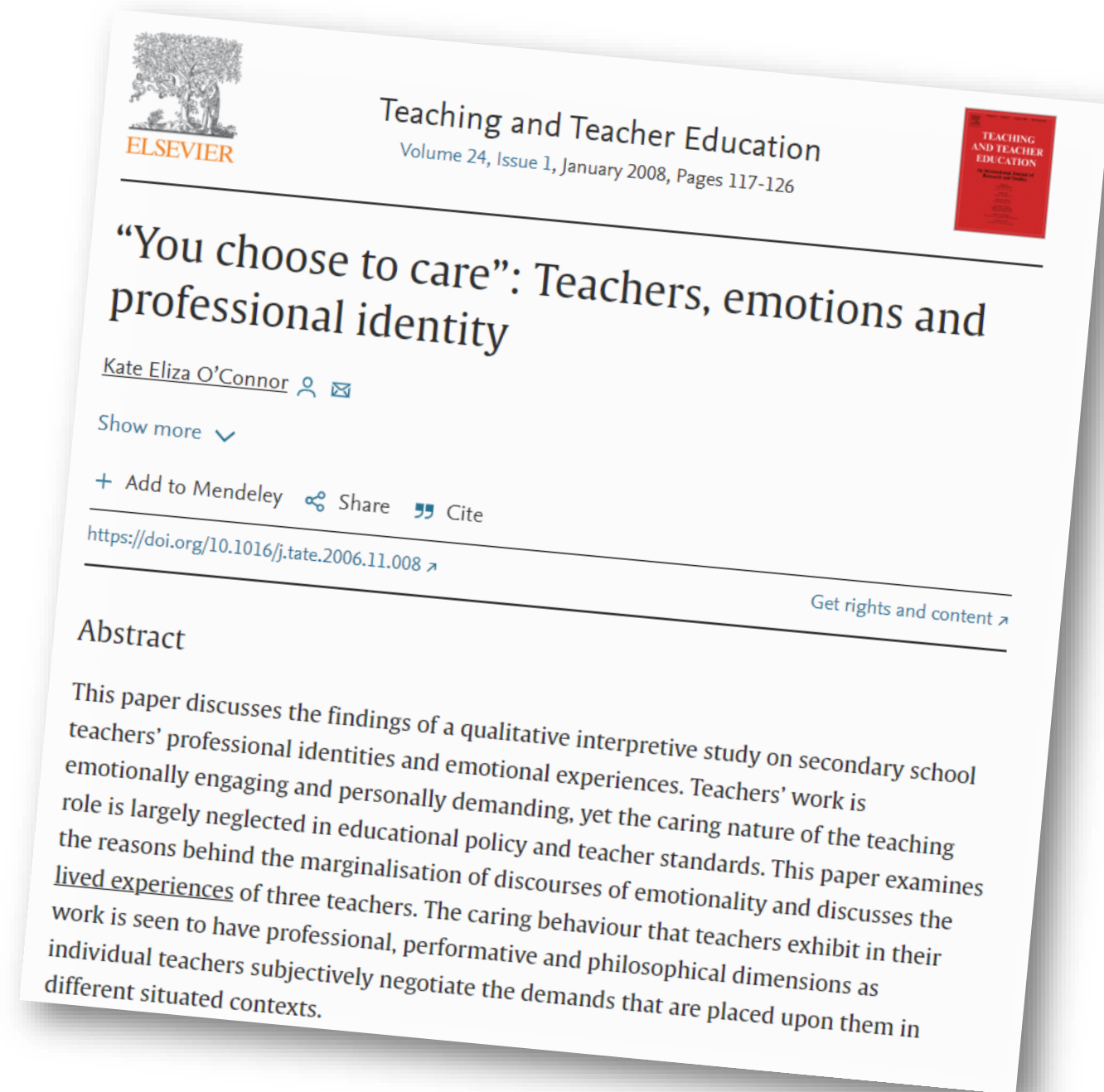
Beware of AI for factual writing

Explore AI for critical thinking, creativity, argumentation

Introduce and negotiate guidelines for students and staff

Develop AI literacy

Adopt ethical AI for education



Resources

Sharples, M. (2022). Automated essay writing: an AIED opinion. *International Journal of Artificial Intelligence in Education*, 32(4), 1119-1126.

Sharples, M., & Pérez y Pérez, R. (2022). *Story Machines: How Computers Have Become Creative Writers*. Routledge.

Pérez y Pérez, R. & Sharples, M. (2023). *An Introduction to Narrative Generators: How Computers Create Works of Fiction*. Oxford University Press.

UNESCO (2023). ChatGPT and artificial intelligence in higher education: Quick start guide.

