

# Generative AI and Education

## Issues and opportunities

Mike Sharples

Institute of Educational Technology  
The Open University

[www.mikesharples.org](http://www.mikesharples.org)



@sharplm

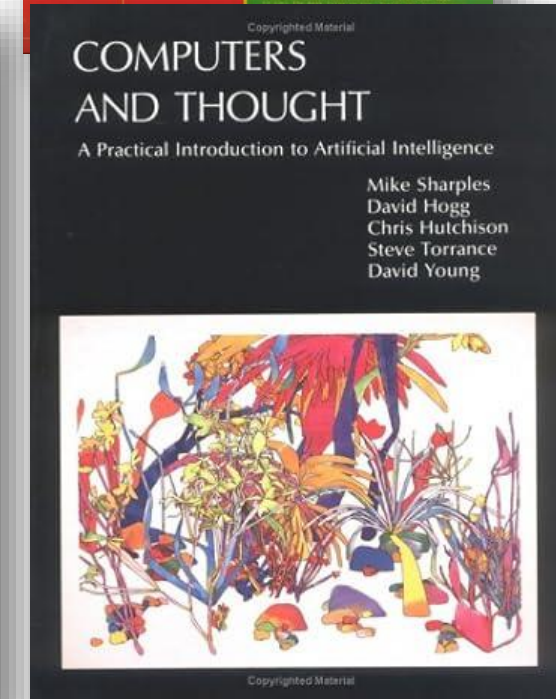
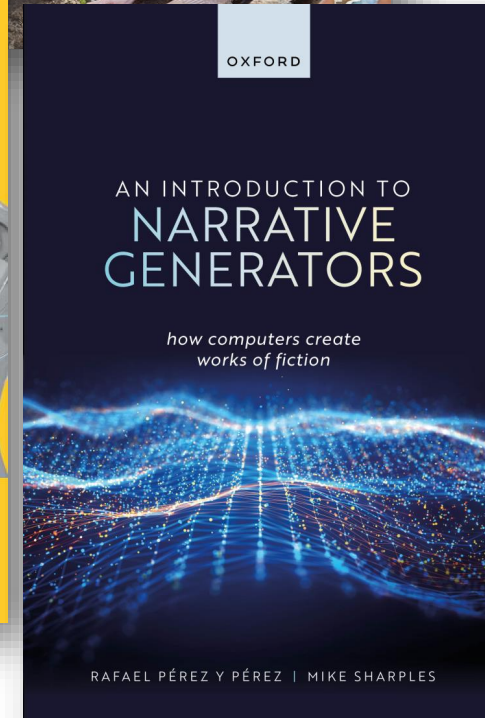
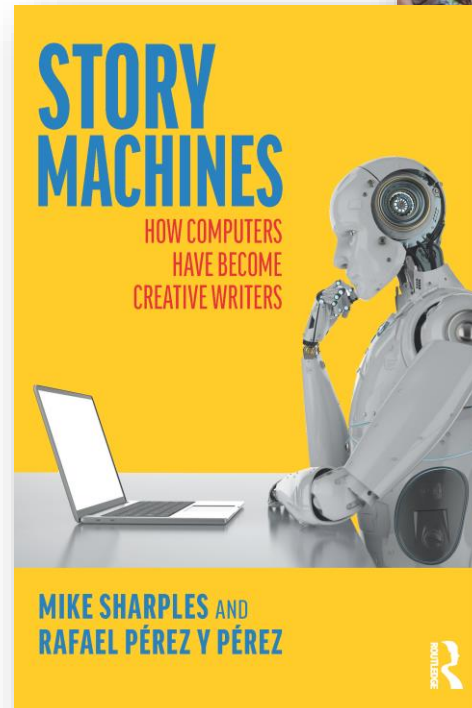
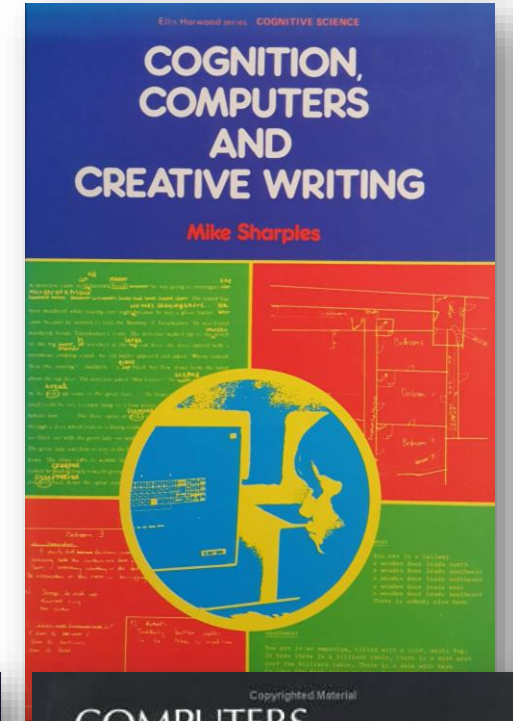
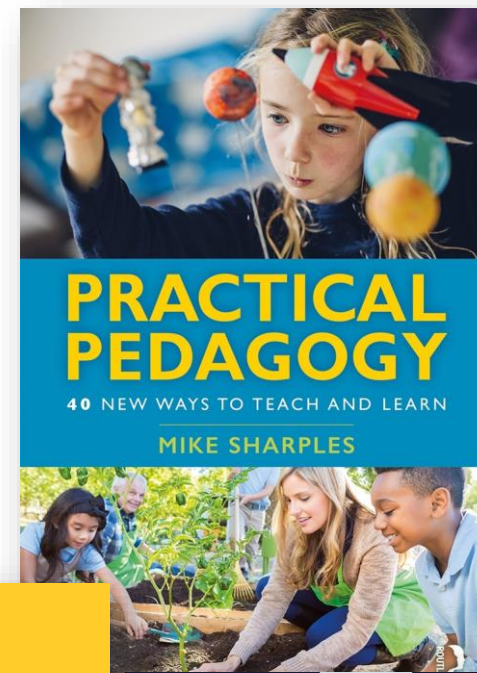
Emeritus Professor of Educational Technology at The Open University

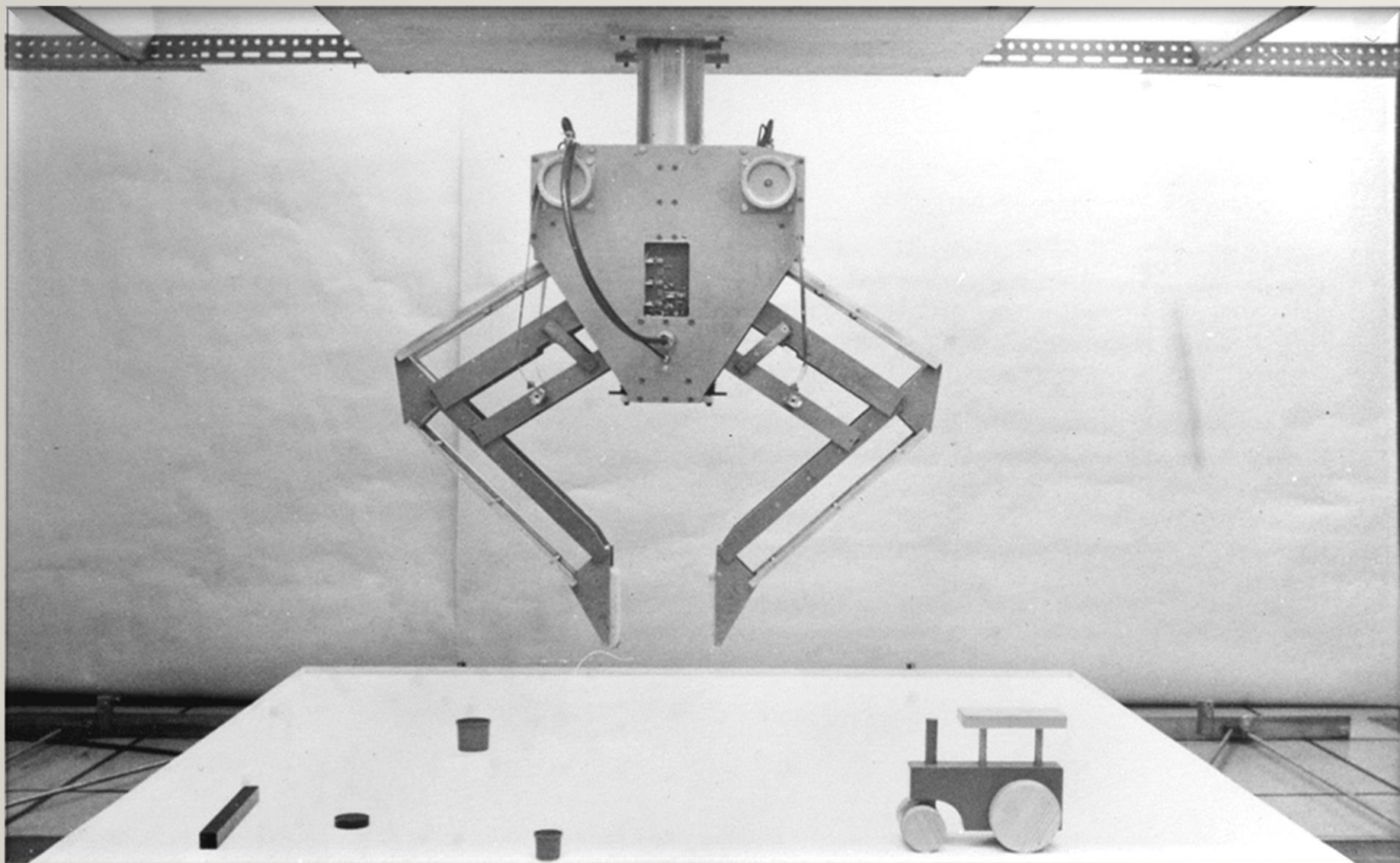
PhD in generative AI and education from University of Edinburgh,  
Department of Artificial Intelligence

Developed educational technology with British Telecom, Nokia, Kodak, Microsoft

Consultancy for schools, universities, UNESCO, OECD

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







BUT INSIDE ROOM 3B—



Generative AI

# ChatGPT

## Large Language Model from OpenAI

Highly-trained text completer and style copier

It can generate up to 100,000 words (300 pages)

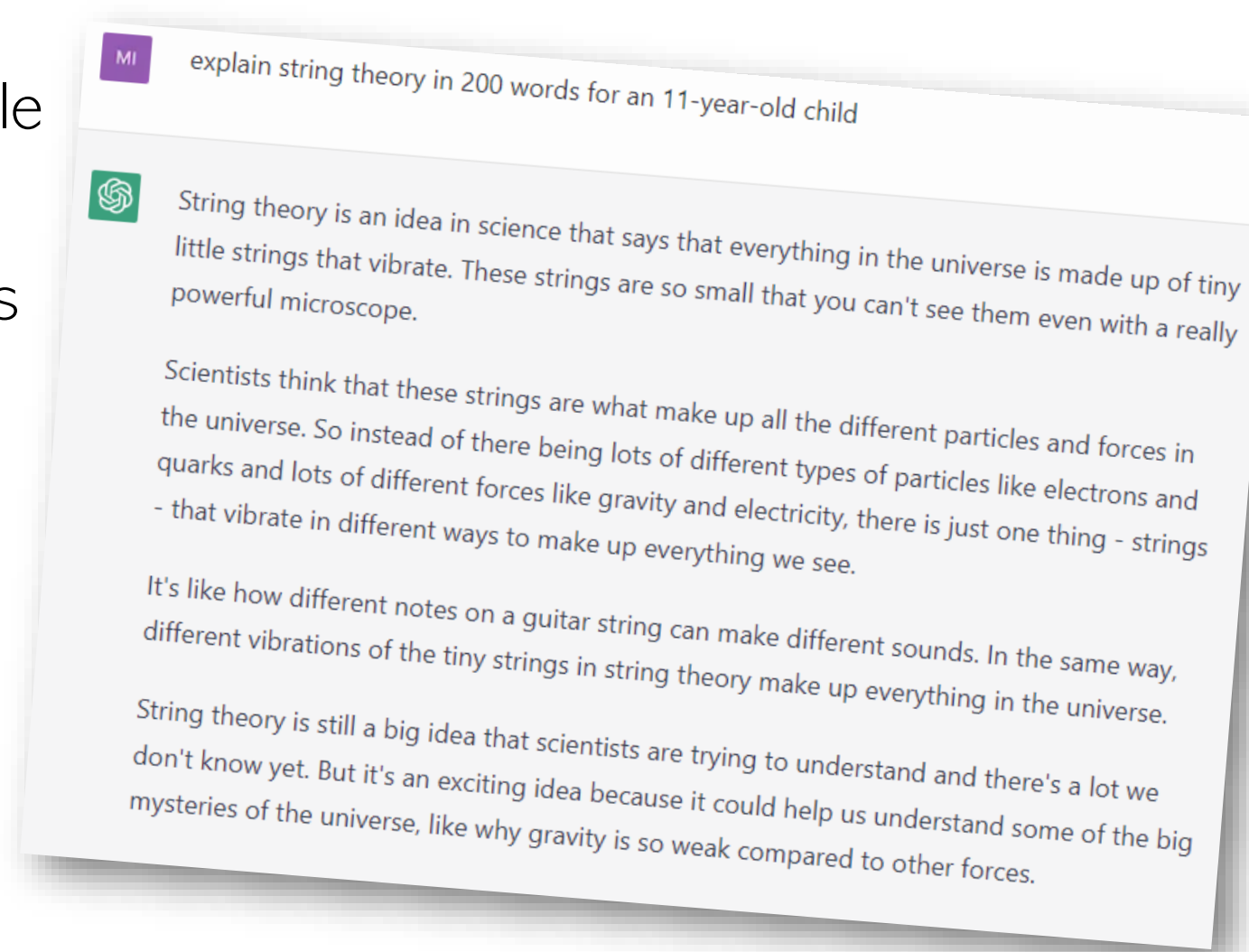
It can write in any style in multiple languages

It can be given a direct instruction

It can engage in conversation

It can interpret text and images

**It is a general-purpose language tool**

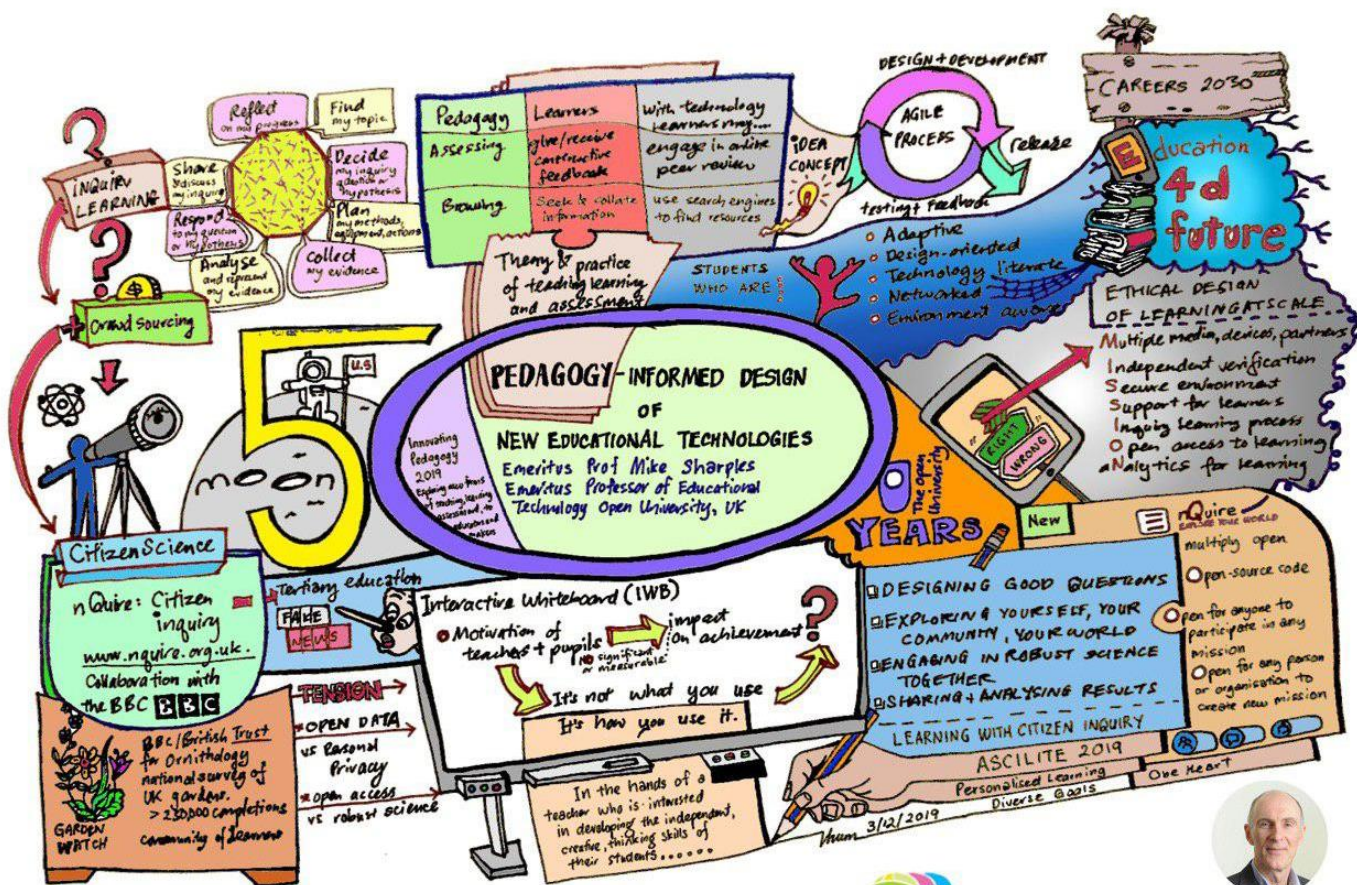








*"Please explain this diagram then create a simplified version of it"*



Read the handwriting

Understand the visual content and purpose of the diagram

Interpret each image

Understand the text and images in context

Explain each part of the diagram

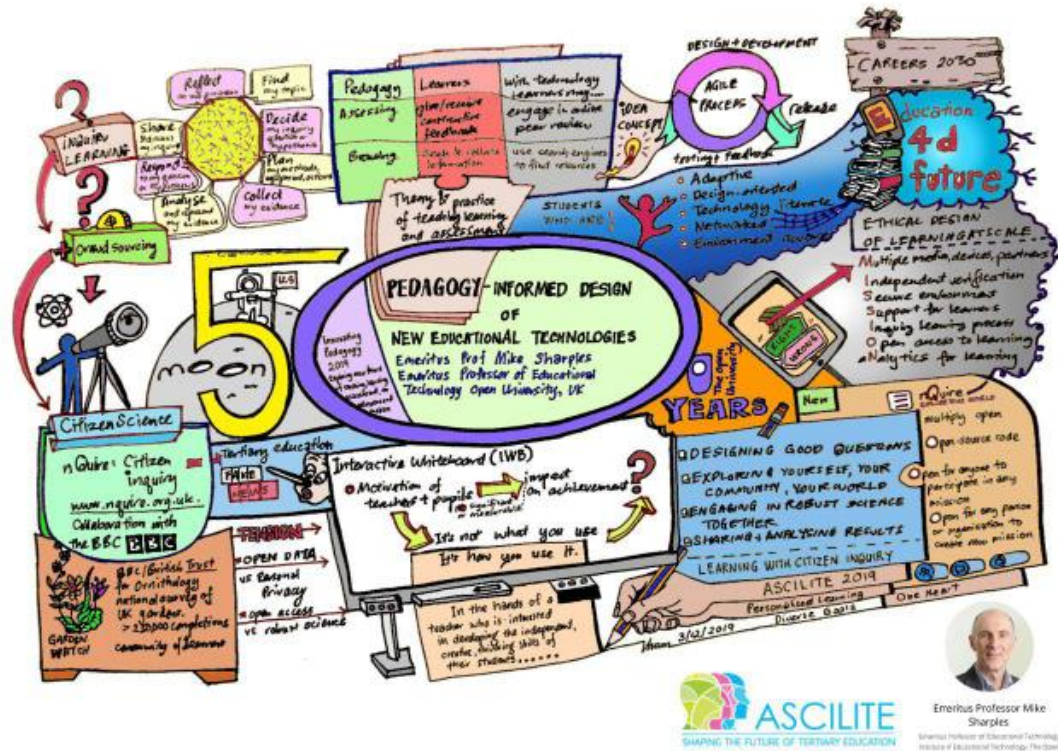
Select the elements to simplify

Design a simplified diagram



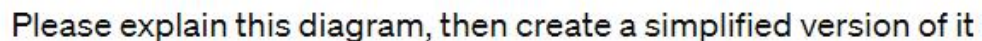
# ChatGPT 4.0

**You**



Please explain this diagram, then create a simplified version of it

**MI You**



The diagram you've provided is a visual representation of a concept or framework related to educational technologies and pedagogy. Here's a breakdown of the key elements and their possible meanings:

- 1.

**Pedagogy-Informed Design:** This is the central theme of the diagram. It suggests that educational design, especially with new technologies, should be informed by pedagogical theories and practices.

- 2.

**New Educational Technologies:** The diagram references emerging technologies in education, possibly including digital platforms and interactive tools that support learning.

- 3.

**Citizen Science:** This section suggests the involvement of the general public in scientific research, possibly through data collection and analysis, often facilitated by digital technology.

- 4.

**Inquiry Learning:** The diagram illustrates a process of learning that involves asking questions, collecting evidence, and analyzing results, which is a key component of constructivist learning theories.

- 5.

**Design and Development Process:** Agile practices are mentioned here, implying a flexible and iterative approach to the development of educational technologies.

- 6.

**Education 4D Future:** This likely refers to a futuristic view of education that includes dimensions beyond traditional learning environments, possibly embracing virtual reality, augmented reality, and other immersive technologies.

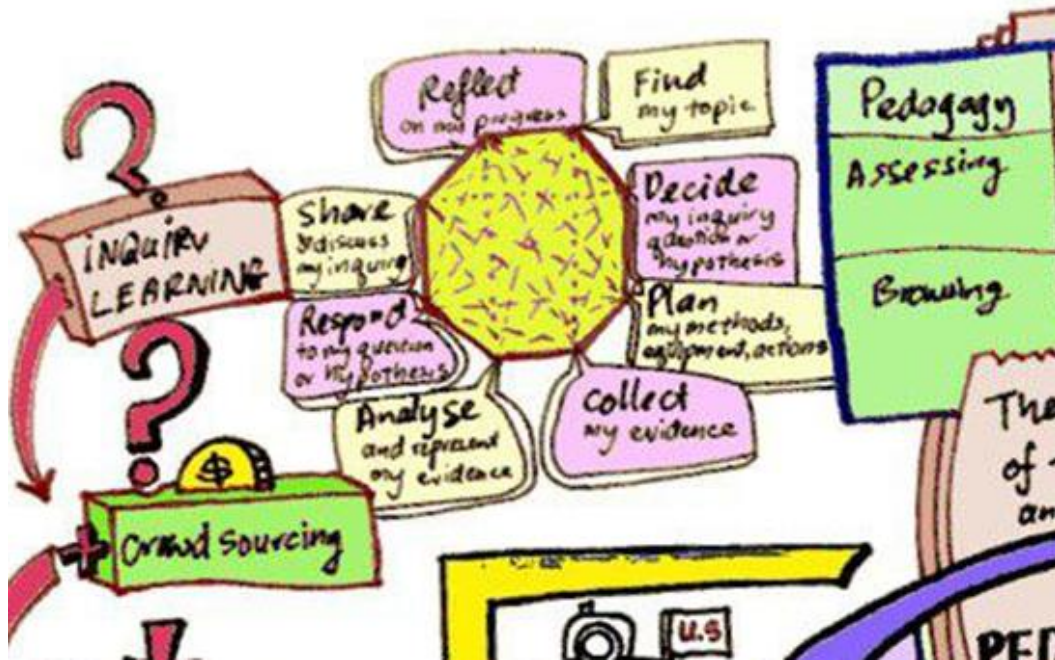
- 7.

**Careers 2030:** This section is probably speculating on the future of careers and the necessary skills and knowledge that will be required in the future workforce.

- 8.

**Designing Good Questions:** This part emphasizes the importance of question design in educational settings, encouraging exploration, engagement, and in-depth analysis.





4.

**Inquiry Learning:** The diagram illustrates a process of learning that involves asking questions, collecting evidence, and analyzing results, which is a key component of constructivist learning theories.

The person mentioned, Emeritus Professor Mike Sharples, is likely a scholar in the field of educational technology, and the reference to ASCILITE (Australasian Society for Computers in Learning in Tertiary Education) suggests that this diagram might have been part of a presentation or publication related to a conference or workshop organized by this society.

To create a simplified version of this diagram, we would focus on the main themes without the detailed explanations and examples. The simplified version would have the central idea of "Pedagogy-Informed Design" surrounded by key components like "Educational Technologies," "Inquiry Learning," "Agile Development," and "Future of Education." Each of these components would be represented by simple icons or single-word descriptions to convey the concept visually. Would you like me to create a simplified visual version of this diagram?

MI

**You**

Yes please. Give it a try.



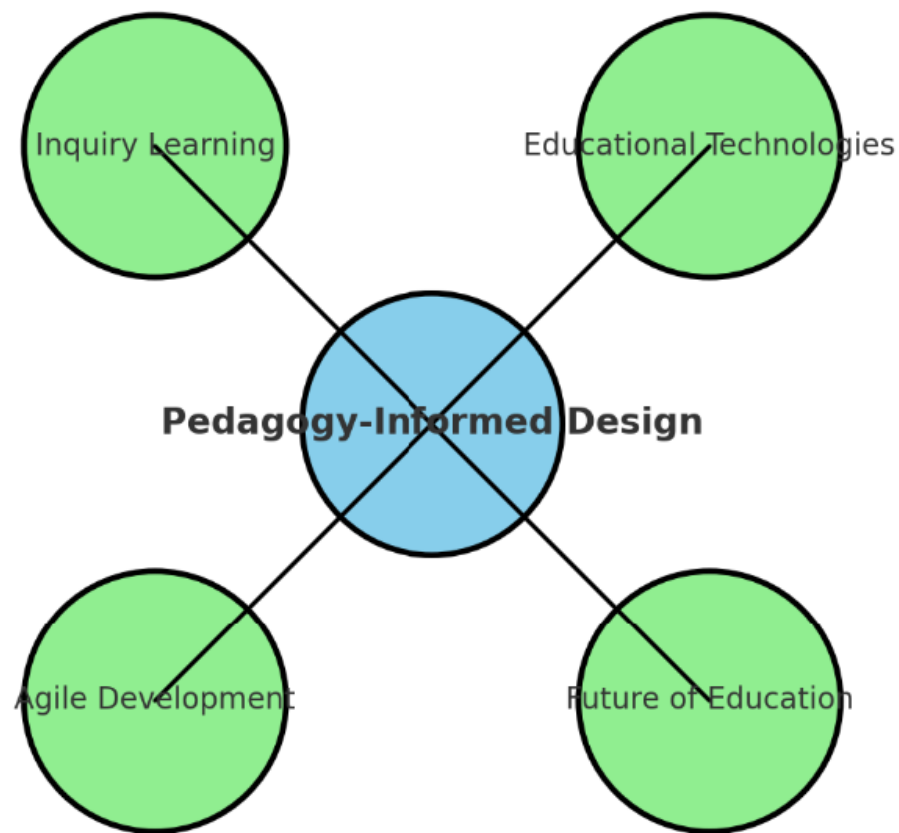
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You

Yes please. Give it a try.



Here is the diagram created using Python. It clearly highlights the central theme of "Pedagogy-Informed Design" with the key components "Educational Technologies," "Inquiry Learning," "Agile Development," and "Future of Education" connected around it. Each key component is represented by a circle and connected to the central concept. [\[↗\]](#)

# Other AI generators

## Language models

**GPT-4 from OpenAI** – powerful, multimedia, 100,000 word context window, free with Microsoft CoPilot, being integrated into Microsoft Office tools

**Gemini from Google** – multimedia, reasoning and problem solving, free with Bard chat

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

**Claude-3 from Anthropic** – trained on ethical principles, 200,000 words. Sonnet version free on claude.ai

**Ernie from Baidu & Tongyi Qianwen from Alibaba** – English/Chinese

**Perplexity.AI** – AI-driven search engine

## Image generators

**DALL-E 3 from OpenAI** – chat, 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)**



Adobe Firefly



Runway



# Generative AI and education

# Generative AI is an “arrival technology”\*

Unplanned

Imposed on education

Led by students – exploited by startup companies

Hugely disruptive


Can harm education if it is not well managed


Institutions are struggling to cope



\*Klopfer, Eric, Justin Reich, Hal Abelson, and Cynthia Breazeal. 2024. "Generative AI and K-12 Education: An MIT Perspective." An MIT Exploration of Generative AI, March. <https://doi.org/10.21428/e4baedd9.81164b06>.

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



# A Critique of Learning Styles ChatGPT – November 2022

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. 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.

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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.

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

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Invented  
research  
study

Fake  
academic  
paper

# 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/>



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 essay explores the origins 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. They identified four categories: 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 (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:

- Coffield, F., Moseley, D., Hall, E., & Ecclestone, K. (2004). Learning styles and pedagogy in post-16 learning: A systematic and critical review. Learning and Skills Research Centre.
- Dunn, R., & Dunn, K. (1978). Teaching students through their individual learning styles: A practical approach. Reston Publishing Company.
- Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., & Willingham, D. T. (2013). Improving students' learning with effective learning techniques: Promising directions from cognitive and educational psychology. Psychological Science in the Public Interest, 14(1), 4-58.
- Fleming, N. D. (2001). Teaching and learning styles: VARK strategies. Christchurch, New Zealand.
- Kirschner, P. A., & van Merriënboer, J. J. (2013). Do learners really know best? Urban legends in education. Educational Psychologist, 48(3), 169-183.
- Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2008). Learning styles: Concepts and evidence. Psychological Science in the Public Interest, 9(3), 105-119.
- Riener, C., & Willingham, D. (2010). The myth of learning styles. Change: The Magazine of Higher Learning, 42(5), 32-35.
- Willingham, D. T. (2009). Why don't students like school? A cognitive scientist answers questions about how the mind works and what it means for the classroom. Jossey-Bass.

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

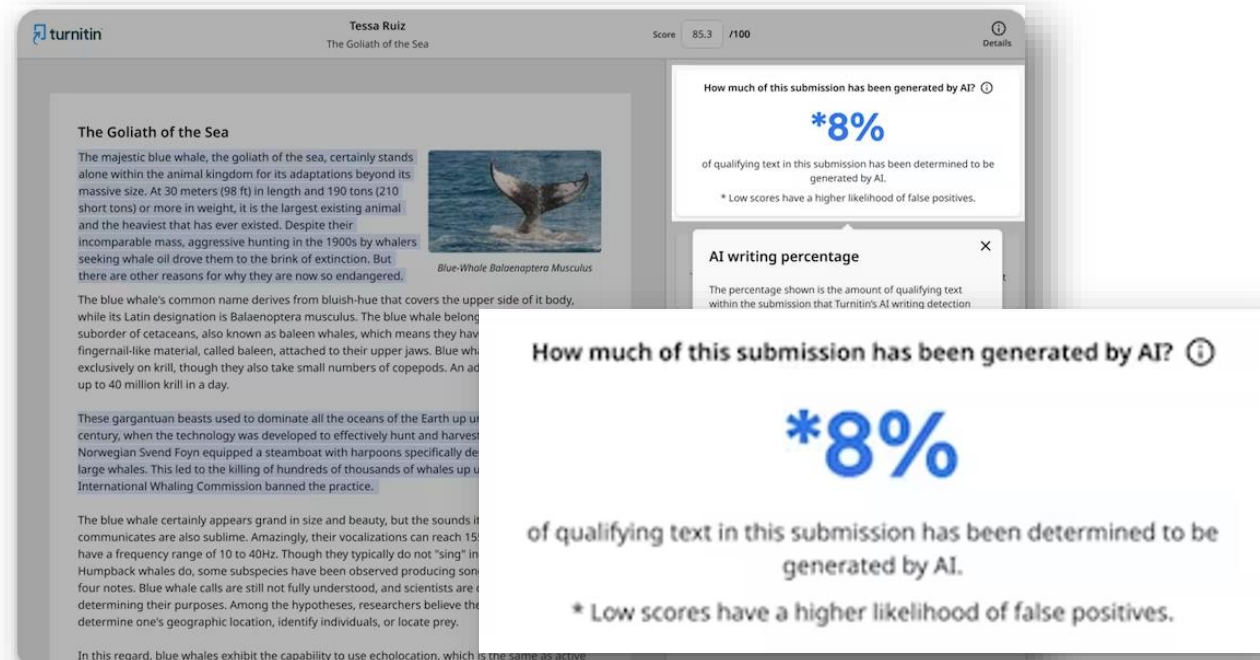
Turnitin AI detector

Claims less than 1% false positives ("with over 20% of AI writing").

<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>



Turnitin detector tool

**GPT detectors are biased against non-native English writers**

Weixin Liang<sup>1\*</sup>, Mert Yuksekgonul<sup>1\*</sup>, Yining Mao<sup>2\*</sup>, Eric Wu<sup>2\*</sup>, and James Zou<sup>1,2,3,\*</sup>

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<sup>2</sup>Department of Electrical Engineering, Stanford University, Stanford, CA, USA

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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

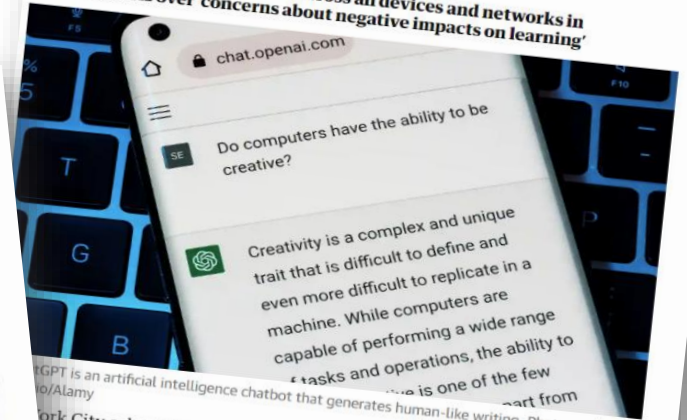


While some universities seek to deal with threats to academic integrity, one ex... were fighting a losing battle to contain AI. Photograph: Jonathan Raa/NurPhoto/... Australian universities have been forced to change the way they... and other assessments amid fears students are using emerging a... intelligence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

### 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: Emerging policy and strategy

**Amend** written assessments, to track the writing process, or make them harder for AI to generate, e.g. based on lab work

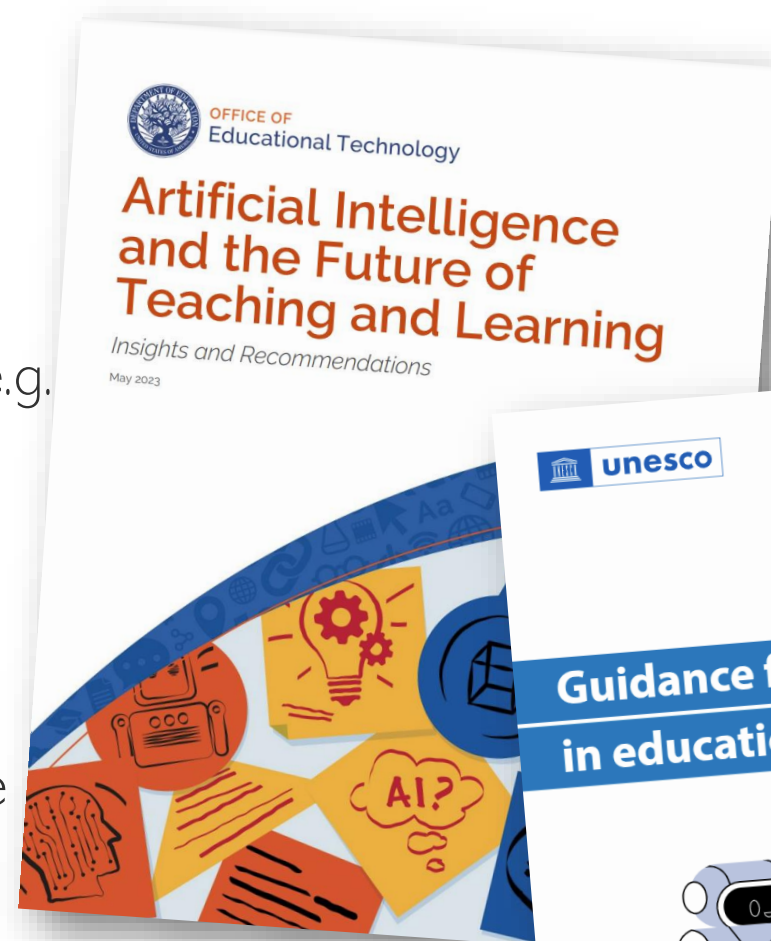
Move to more **authentic assessments**, such as project work where students apply knowledge and skills to plausible situations

**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



<https://tech.ed.gov/ai-future-of-teaching-and-learning/>



<https://unesdoc.unesco.org/ark:/48223/pf0000386693.locale=en>

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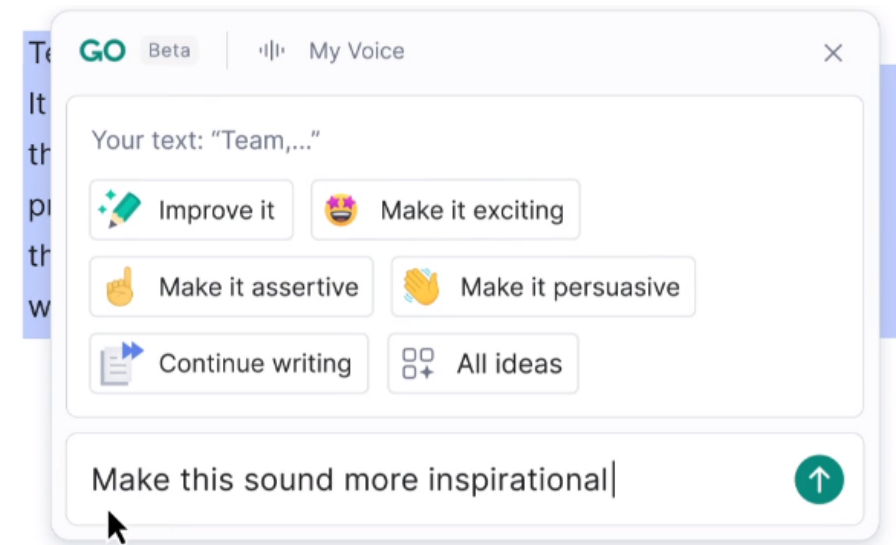
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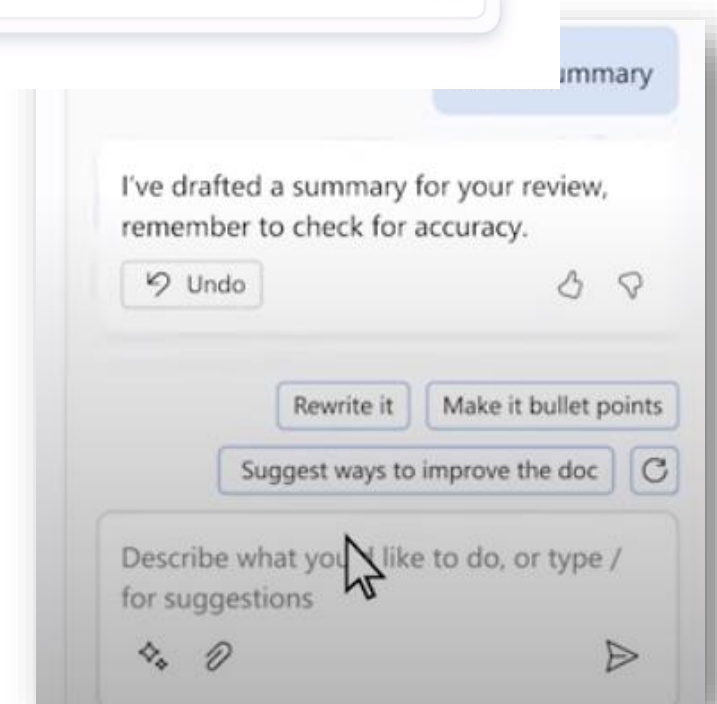
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**Manage suspected breaches** of guidelines



Grammarly



Microsoft 365 Copilot in Word

Explain to students how they should **acknowledge use of generative AI** in assignments, for inclusive education

**Where to draw the line on “use of generative AI”?**

Spell check?

Grammar check?

Style check?

Machine translation?

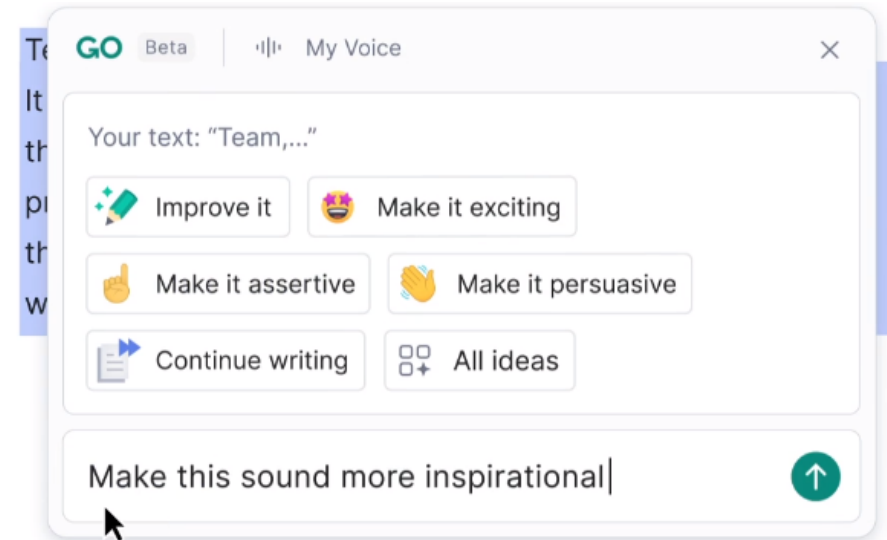
“Brainstorm ideas”?

“Continue writing”?

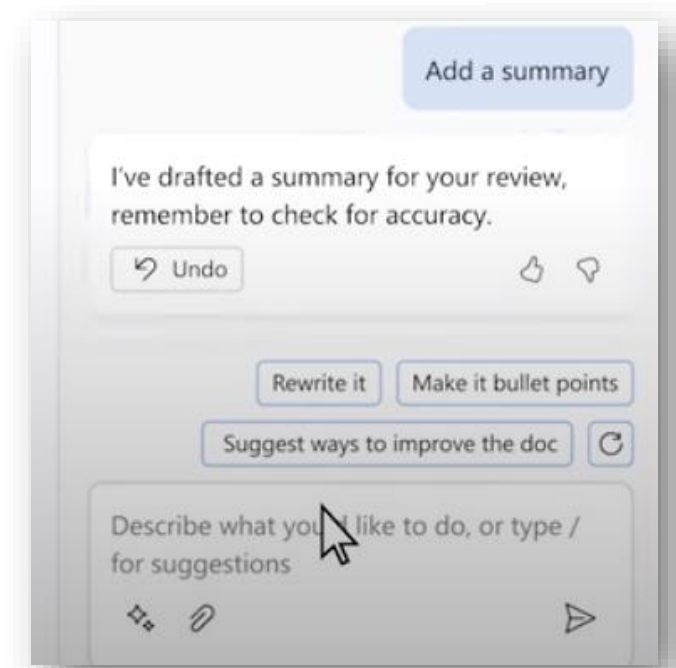
“Suggest ways to improve my document”?

“Rewrite my document”?

Generate all or part of an assignment?



Grammarly



Microsoft 365 Copilot in Word



# Need for AI literacy

## Technology

- Understanding types of AI
- Opportunities and limitations

## Engagement

- Roles for AI in education, workplace, commerce, entertainment
- How to engage constructively

## Ethics

- Copyright and plagiarism
- Bias and misinformation
- Ethical choices

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

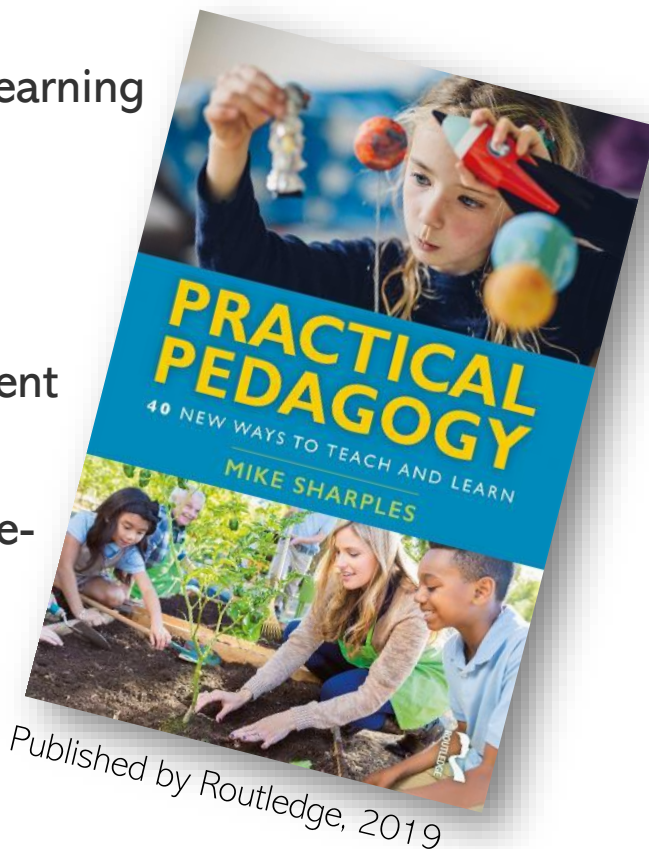
Citizen inquiry

Rhizomatic learning

Reputation management

Open pedagogy

Humanistic knowledge-building communities

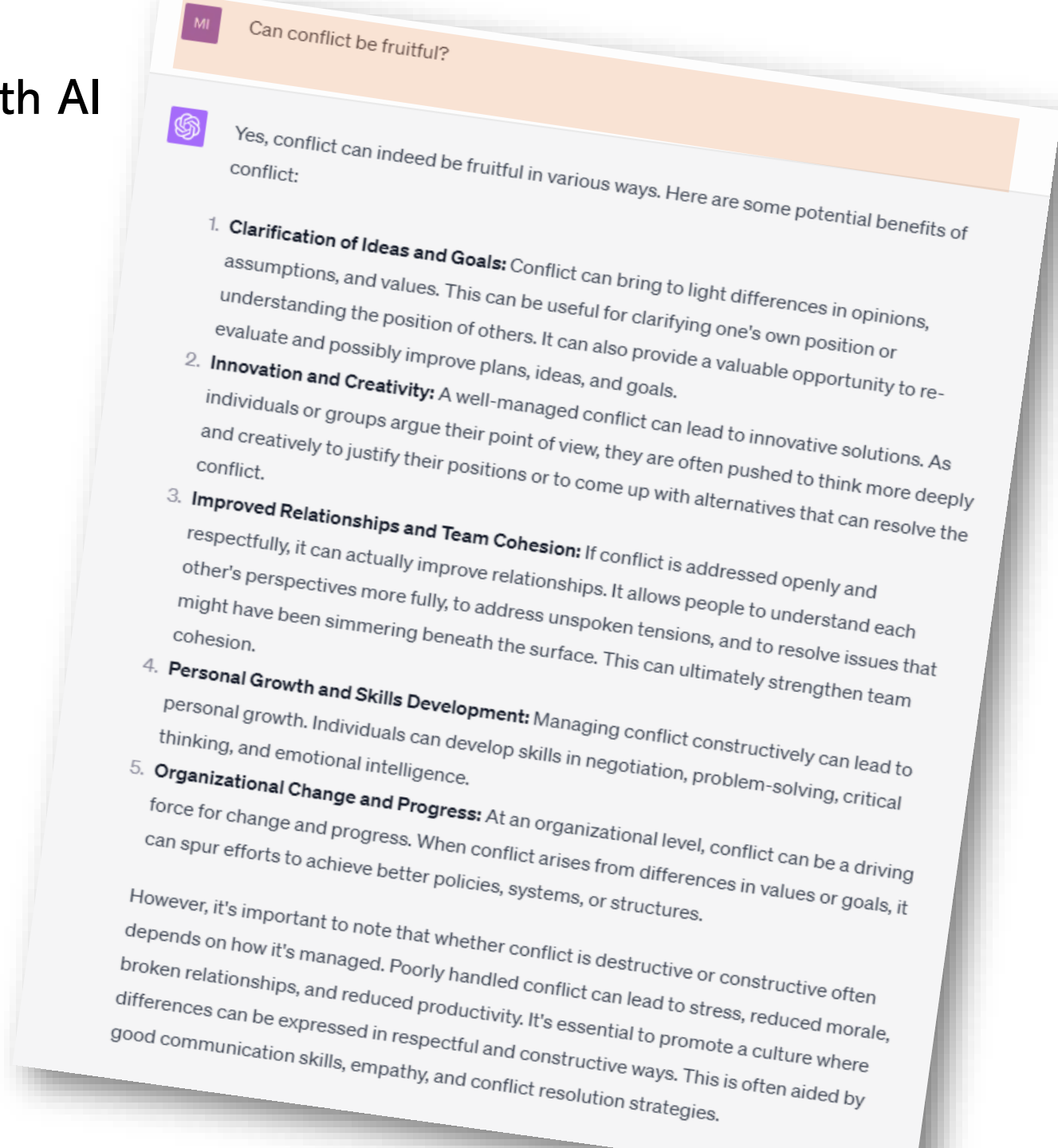




# New ways of teaching and learning with AI

## 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 and learning 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.

However, it's essential to note that the fruitfulness of conflict largely depends on how it's approached and managed. Constructive conflict resolution strategies, such as open communication, active listening, and empathy, can lead to positive outcomes. On the other hand, avoiding conflict or approaching it with aggression can exacerbate issues and lead to negative consequences.

MI

But forcing individuals to face their beliefs, biases and assumptions could just lead to anger and denial. How could that be fruitful?



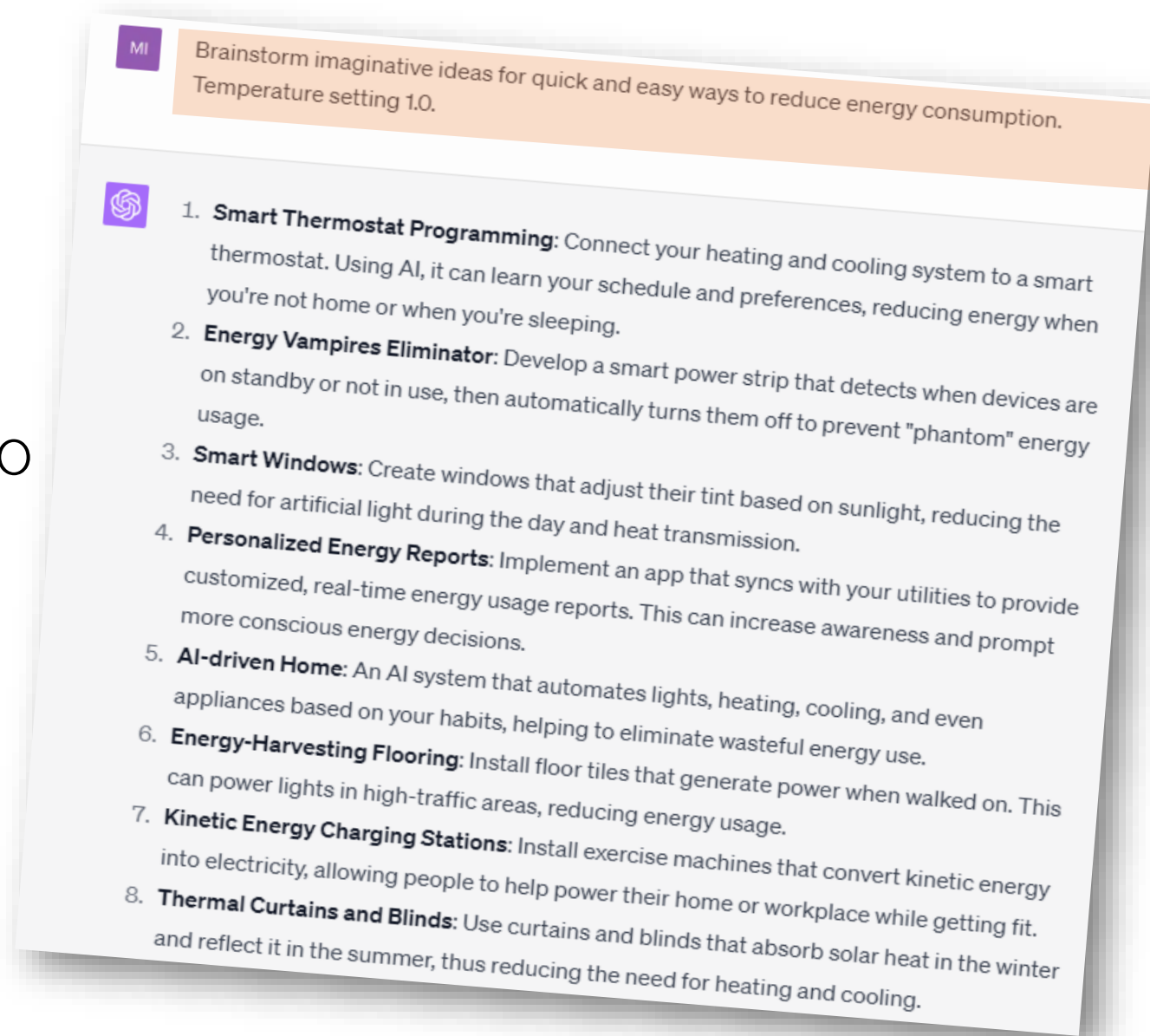
You're right. Forcing individuals to confront their beliefs, biases, and assumptions can lead to immediate negative reactions such as anger, defensiveness, and denial. However, the potential fruitfulness comes from what happens after this initial reaction, and how the situation is managed:

1. **Opportunity for Reflection:** While the immediate reaction might be negative, the confrontation can plant a seed of introspection. Over time, individuals might reflect upon the conflict and gain insights about their own perspectives.
2. **Building Emotional Intelligence:** Facing challenging situations can lead to the development of emotional intelligence. By navigating conflicts, individuals can learn to regulate their emotions, understand the emotions of others, and improve their interpersonal skills.
3. **Skill Development:** Managing negative reactions such as anger and denial requires the development of conflict resolution skills. This includes active listening, empathy, and effective communication. Over time, individuals can become better at handling disagreements and diverse viewpoints.
4. **Encouraging Open Dialogue:** Confrontation can pave the way for open dialogue. If managed correctly, it can create a space where individuals feel safe to express their opinions and feelings, leading to a deeper understanding of diverse perspectives.

# New ways of teaching and learning with AI

## Co-designer

AI assists a group of students throughout a design process, to define the problem, challenge assumptions, brainstorm ideas, produce prototypes. Use “temperature” setting to adjust creativity.





# New ways of teaching and learning with AI

## Personal Tutor

Students have a personal tutor for any topic.

Provide students with a prompt template:

You are an expert tutor in [subject]. I am a [level] student. I want you to tutor me in [topic]. You should assume [level of ability]. 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 [topic] that I can give to my teacher. Is that clear?

MI You are an expert tutor in English for academic purposes. I am a secondary school 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 get started.

### 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 careful word choice, precise definitions, logical organization, and an impersonal tone.

**Question 1:** Have you ever written an essay or a report for school? If so, what was it about?



I wrote an essay recently on "How bacteria can affect the lives of humans and other organisms"



Great! That's a solid academic topic.

### Step 2: Structure of an Academic Essay

Most academic essays have a specific structure:

1. **Introduction:** Introduces the topic, provides some background, and presents the thesis statement (main argument).

# New ways of teaching and learning with AI

## Personal Tutor

Students have a personal tutor for any topic.

**Question 5:** Let's practice! Imagine you read a book by Dr. Jane Smith in 2020 titled "Bacteria and Human Health." How would you cite this book in APA style in the reference list and as an in-text citation for a paraphrased idea?

MI

Smith, Jane (2020) *Bacteria and Human Health*. (Smith 2020)



You're on the right track! Let's make a few adjustments to align it perfectly with APA style:

**Reference List:**

Smith, J. (2020). *Bacteria and Human Health*. Publisher Name.

(Note: I added the publisher name as a placeholder. In a real citation, you'd replace "Publisher Name" with the actual name of the publisher.)

**In-text Citation for a Paraphrased Idea:**

(Smith, 2020)

You've got the basics down! Remember, the details matter in APA style, such as the placement of periods, italics for book titles, and the order of information.

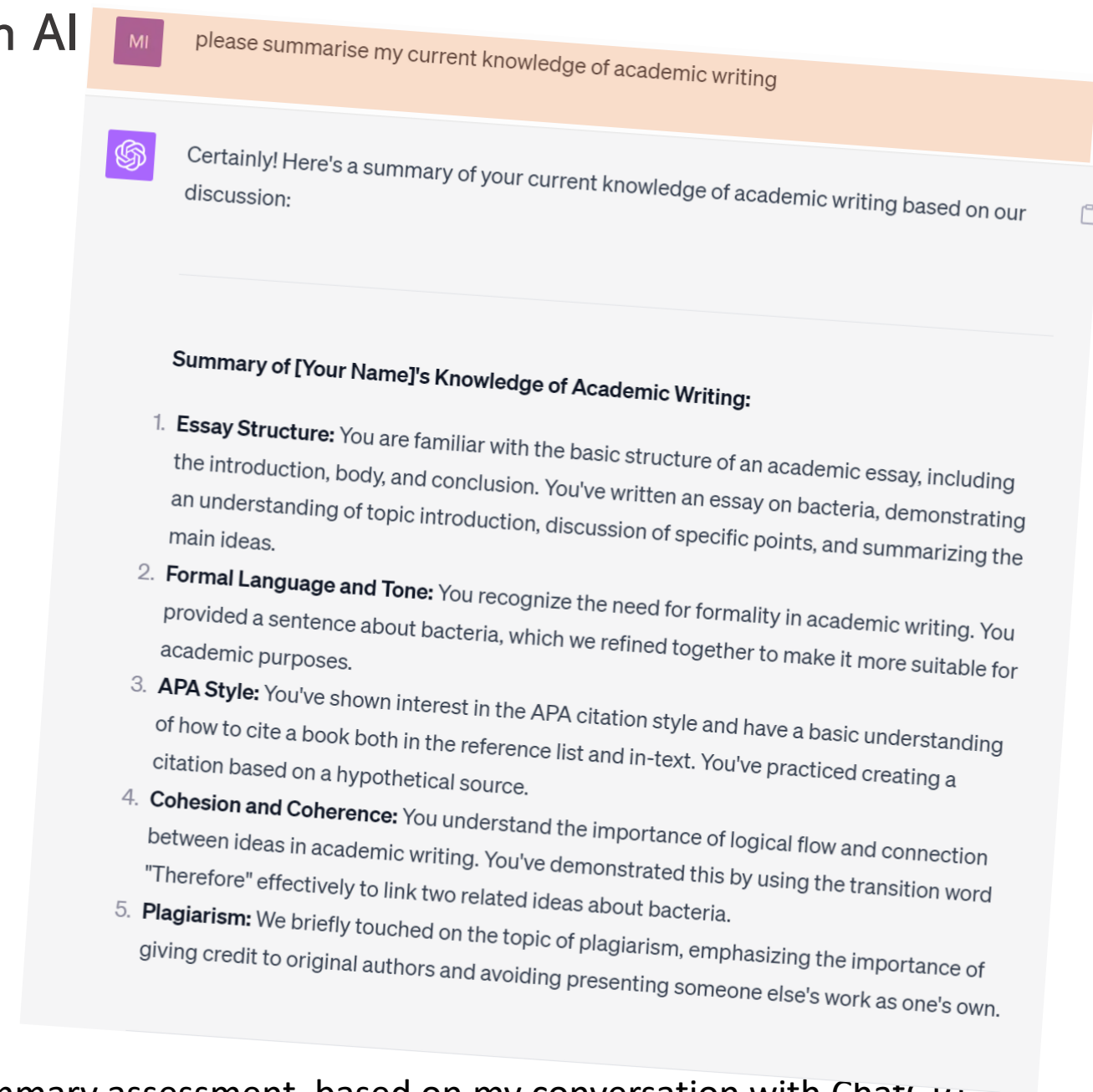
**Step 6: Cohesion and Coherence**

In academic writing, it's essential for your ideas to flow logically and be connected. This is achieved through the use of cohesive devices like transition words (e.g., however, furthermore, in addition) and referencing words (e.g., this, it, they).

# 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



# Roles for social generative AI in education

## Open textbook writer

AI summarises, translates, compares and adapts textbooks for open discussion.

MI You



AEHN\_Textbook\_29\_March\_2023\_final...  
PDF



john\_iliffe\_africans\_the\_history\_of\_a\_co...  
PDF

You are an academic historian. Drawing primarily on material from these two textbooks, I want you to write a text for undergraduate history students on "Colonialism and African development since 1500 " from a European perspective.

MI You

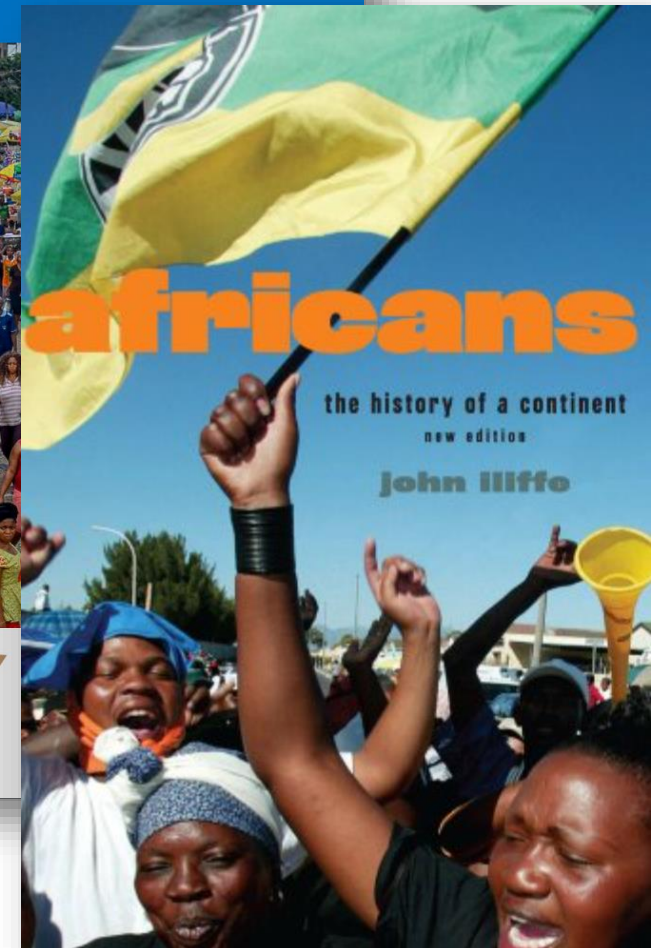
Now, drawing primarily on material from the two textbooks, I want you to write a 1000 word narrative teaching text for undergraduate history students on "Colonialism and African development since 1500 " from an African perspective.

## The History of African Development

*An Online Textbook for a New Generation of African Students and Teachers*

Edited by

Ewout Frankema, Ellen Hillbom, Ushehwedu Kufakurinani  
and Felix Meier zu Selhausen



## A European perspective, based on the two books

Colonialism in Africa, a complex and multifaceted phenomenon, began in earnest in the late 19th century and deeply influenced the continent's developmental trajectory. This narrative seeks to explore the impact of European colonial rule on African development since 1500 from a European perspective, drawing on insights from historical analyses and academic research.

The onset of colonialism can be traced back to the 15th century, with the Portuguese exploration of the African coastline, primarily driven by the quest for new trade routes and territories. However, it wasn't until the Berlin Conference of 1884-1885 that the scramble for Africa among European powers formalized the partitioning of the continent, ignoring African socio-political entities and contributing to the artificial boundaries that define African states today.

European colonialism in Africa was characterized by economic exploitation, social disintegration, and political domination. Colonial powers introduced cash crops, leading to the restructuring of African economies to serve European industrial needs. This economic transformation was underpinned by forced labor and land expropriation, displacing African communities and undermining traditional agriculture and social structures.

The imposition of colonial rule also led to significant socio-cultural disruptions. European powers undermined traditional leadership structures, replacing them with colonial administrations that enforced new legal and educational systems designed to inculcate European values. This cultural imperialism not only eroded African identities but also implanted a sense of inferiority among colonized peoples, a legacy that continues to affect African societies.



## An African perspective, based on the two books

### Colonialism and African Development Since 1500: An African Perspective

The story of colonialism in Africa is a tale of profound transformations, marked by both opportunities and upheavals. From the early phases of European contact, characterized by trade and religious missions, to the full-scale colonization that reshaped the continent's socio-economic and political landscapes, African societies navigated a complex journey through the centuries.

#### The Economic Transformation

The advent of colonial rule brought significant changes to African economies. Initially, most European powers left economic development to private enterprises, focusing mainly on creating infrastructures, legal systems, and imposing taxes that integrated African economies into the global market as specialized producers. This period saw some regions, already engaged in international trade, experiencing less traumatic transitions. For instance, Egypt's cotton industry thrived under British rule, leading to substantial income increases but also to socio-economic disparities.

In West Africa, the integration into the world economy offered advantages, particularly for areas exporting tropical crops. Senegal's groundnut exports and the Gold Coast's cocoa industry are prime examples of African entrepreneurship thriving under colonial conditions. However, this economic integration was not without its costs. The brutal exploitation in the Congo under King Leopold II, driven by the international demand for rubber, highlighted the dark side of colonial economic ambitions.



# Roles for generative AI in education

## **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

## **Lesson planner**

AI helps a teacher in planning a lesson or activity

## **Quiz generator**

AI helps a teacher to generate multiple choice quizzes

## **Personal Tutor**

AI tutors each student and gives immediate feedback

## **Dynamic Assessor**

AI provides educators with a profile of each student

## **Co-Designer**

AI assists throughout the design process

## **Exploratorium**

AI provides tools to discover, explore and interpret data

## **Storyteller**

AI offers ways to explore roles and diversity

Social generative AI in education

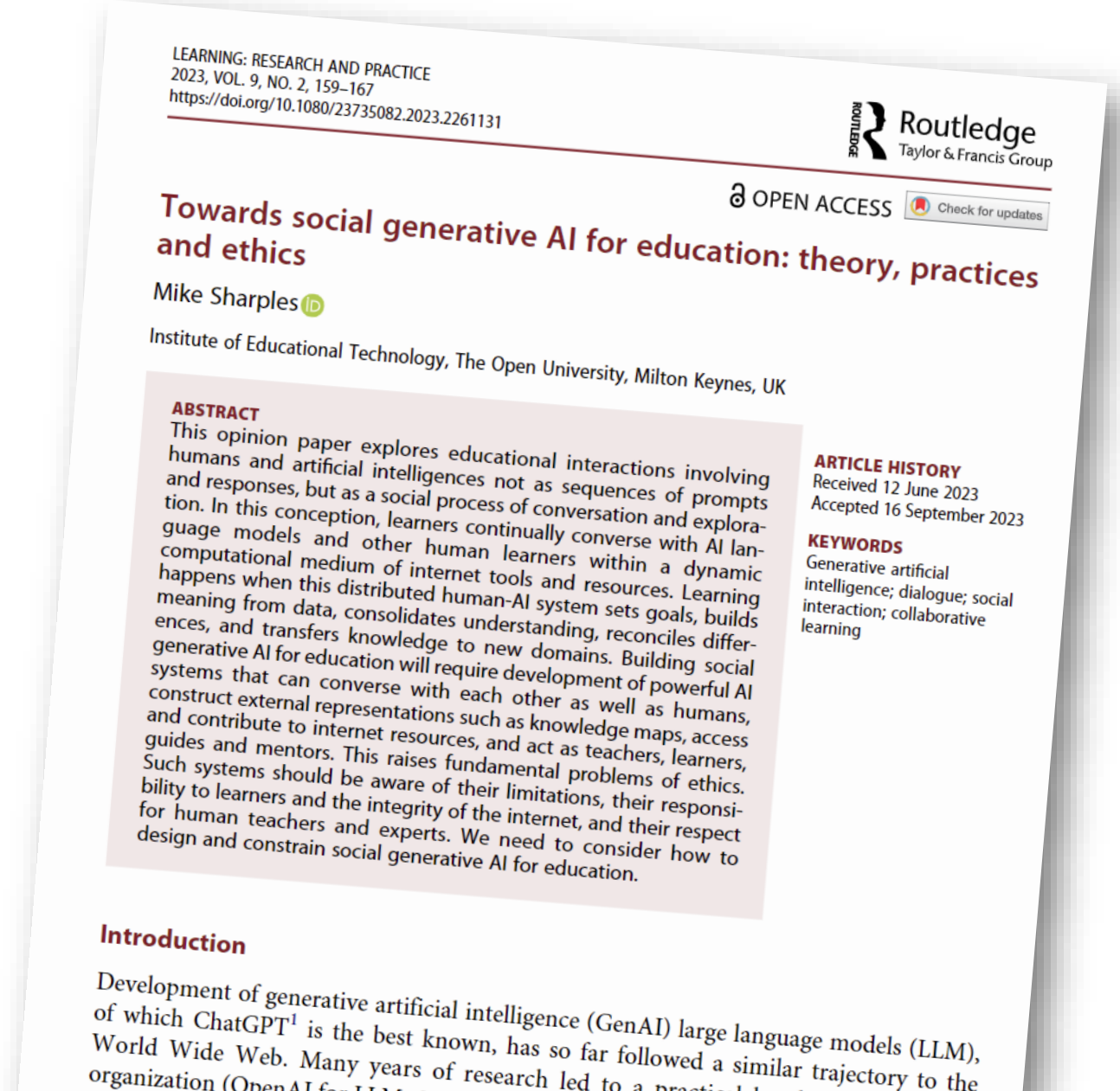


# Beyond ChatGPT – Social Generative AI

OpenAI is developing AI agents that will negotiate and act

Google is working with DeepMind on networked problem-solving AI

Social generative AI  
AI as a guide, mentor, partner in social interactions for learning



# Social generative AI for education

We should prepare for social generative AI – rethink education for an era where humans and machines engage in extended dialogues.

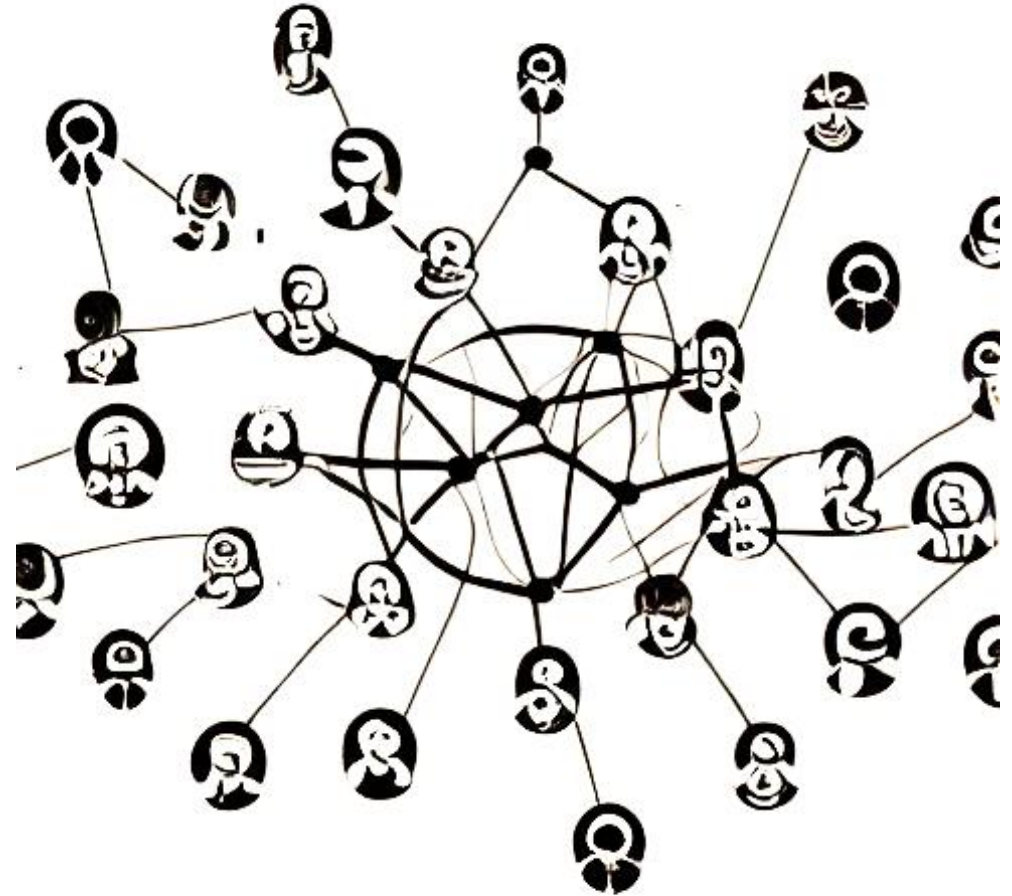


Image generated by Stable Diffusion

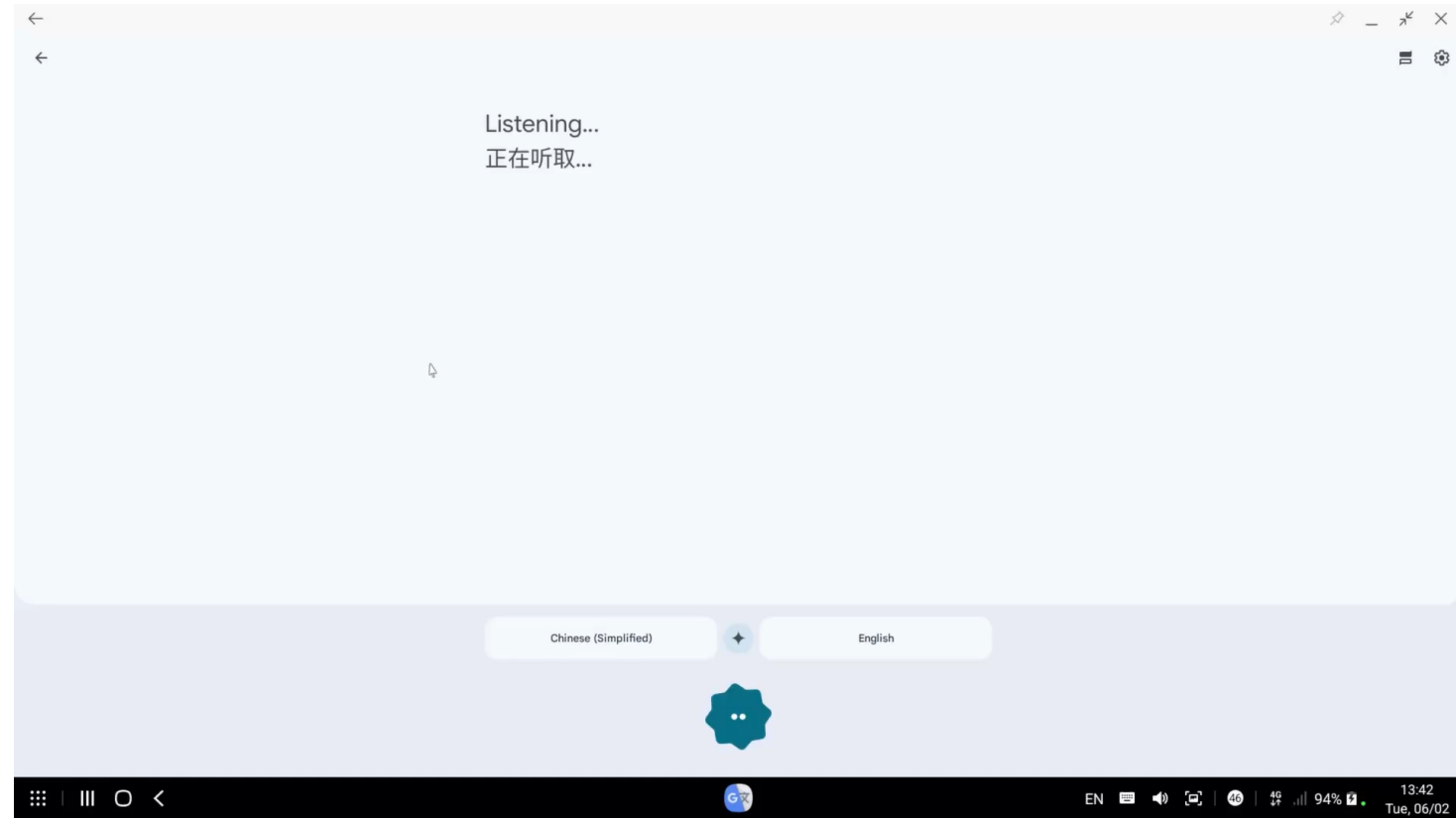
# Speech conversations across languages

Real time speech translation

Meetings in multiple languages

Each participant speaks and hears their own language

Supports non-native speakers of English



Google Translate, conversation mode

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Real time speech translation

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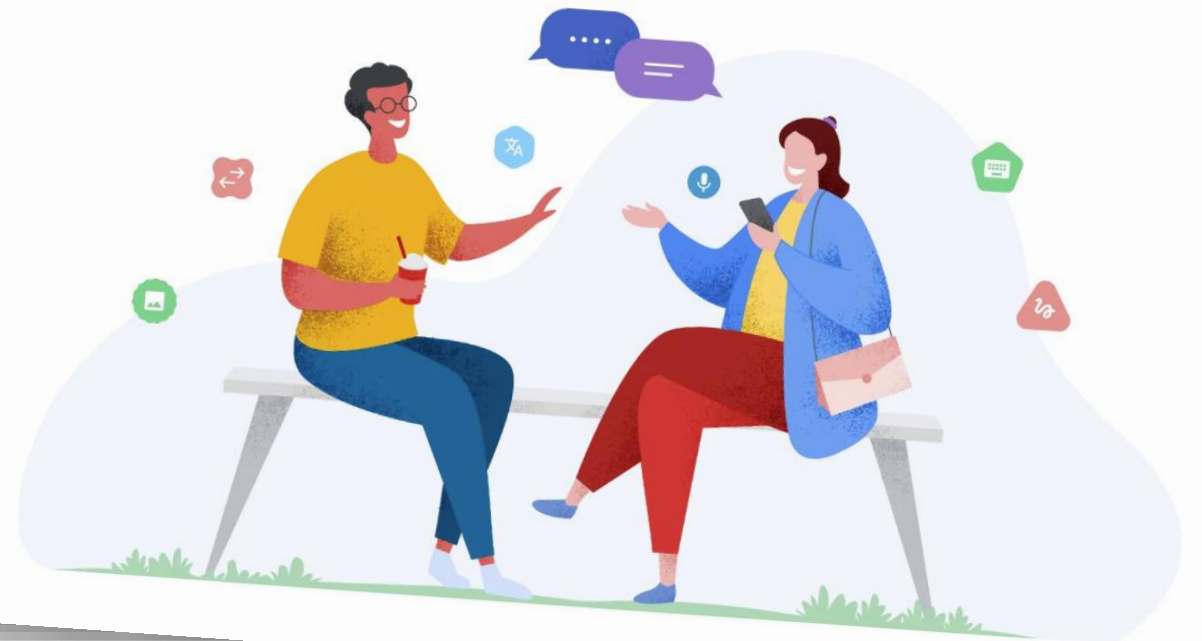
Supports non-native speakers of English

People may come to rely on machines as interlocutors

May increase misunderstandings

Less incentive to learn another language

Understand your world and  
communicate across languages



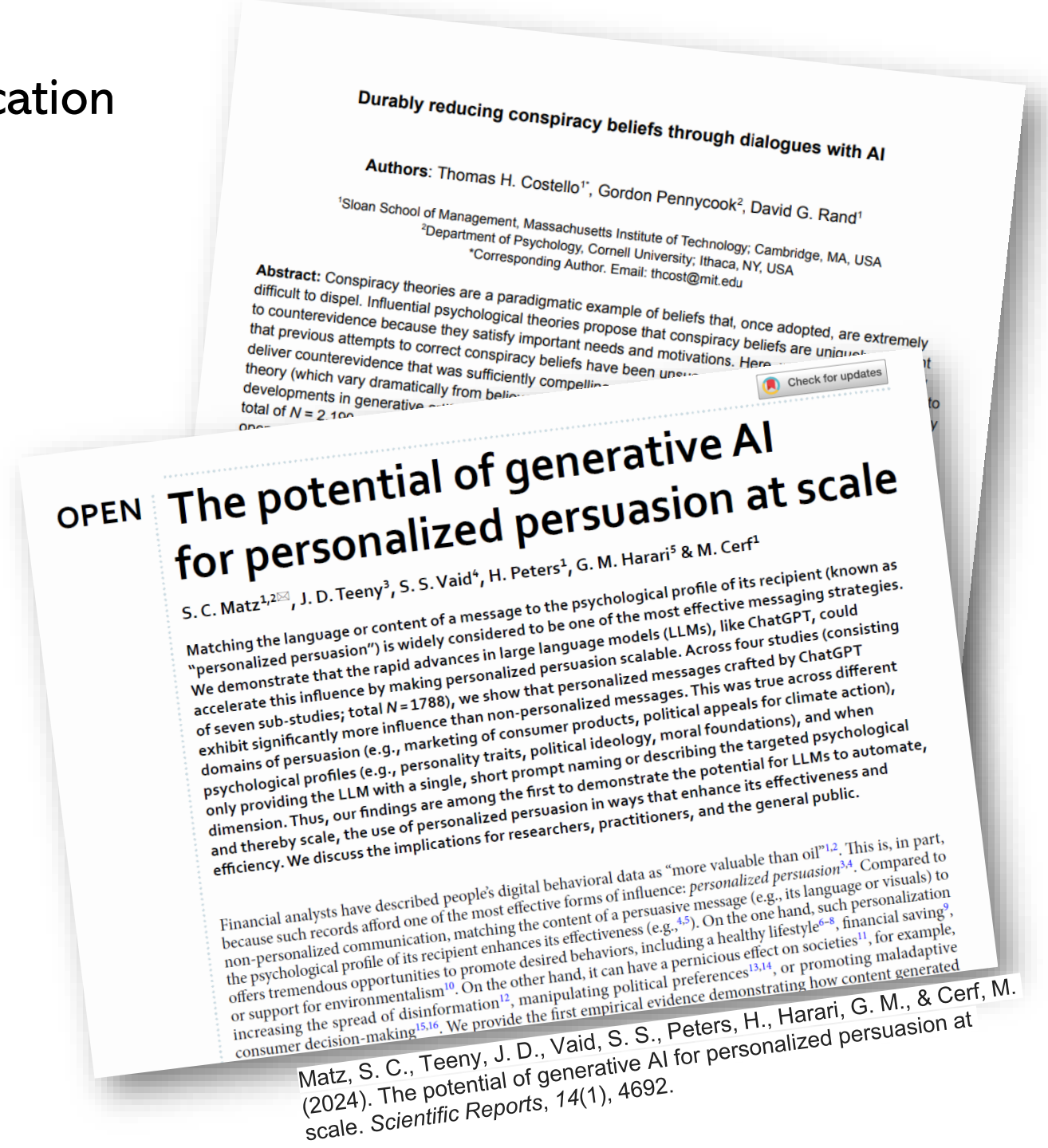
<https://translate.google.com/about/>



# Roles for social generative AI in education

Social generative AI will

- mediate discussions
- change beliefs
- persuade people at scale



Ethical issues

# Limitations and ethical issues (precis)

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

**Potential for bias:** Racial and gender biases and stereotypes. Implicit cultural bias (e.g., adopting a U.S. liberal male persona).

**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.

UK [https://russellgroup.ac.uk/news/new-principles-on-use-of-ai-in-education/Russell Group principles](https://russellgroup.ac.uk/news/new-principles-on-use-of-ai-in-education/Russell%20Group%20principles)

## 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 AI<sup>12</sup>, and the Department for Education (DfE) has set out its position on the use of generative AI in the pre-university education sector<sup>3</sup>. 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.

# Teaching is a caring profession

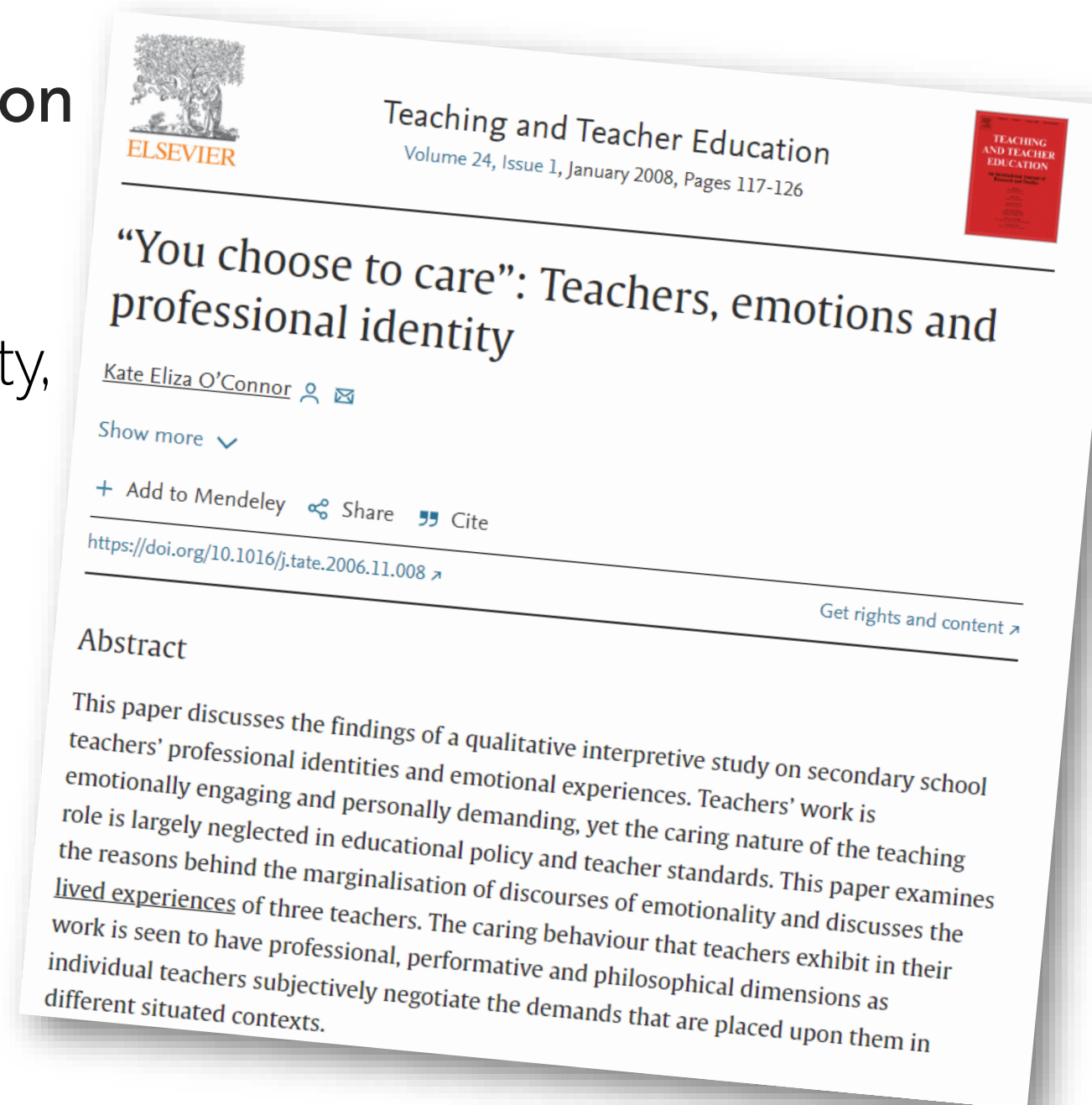
We care for our students

We care about accuracy, integrity, truth

We care about our professional expertise

We care about our human knowledge and experience

AI doesn't care





# Use generative AI with care

We need to bring **human care and empathy** to AI in education

We should explore **new roles** for AI based on effective methods of teaching and learning

We need **digital literacy** to address e.g. implicit bias, erosion of trust, distortion of reality

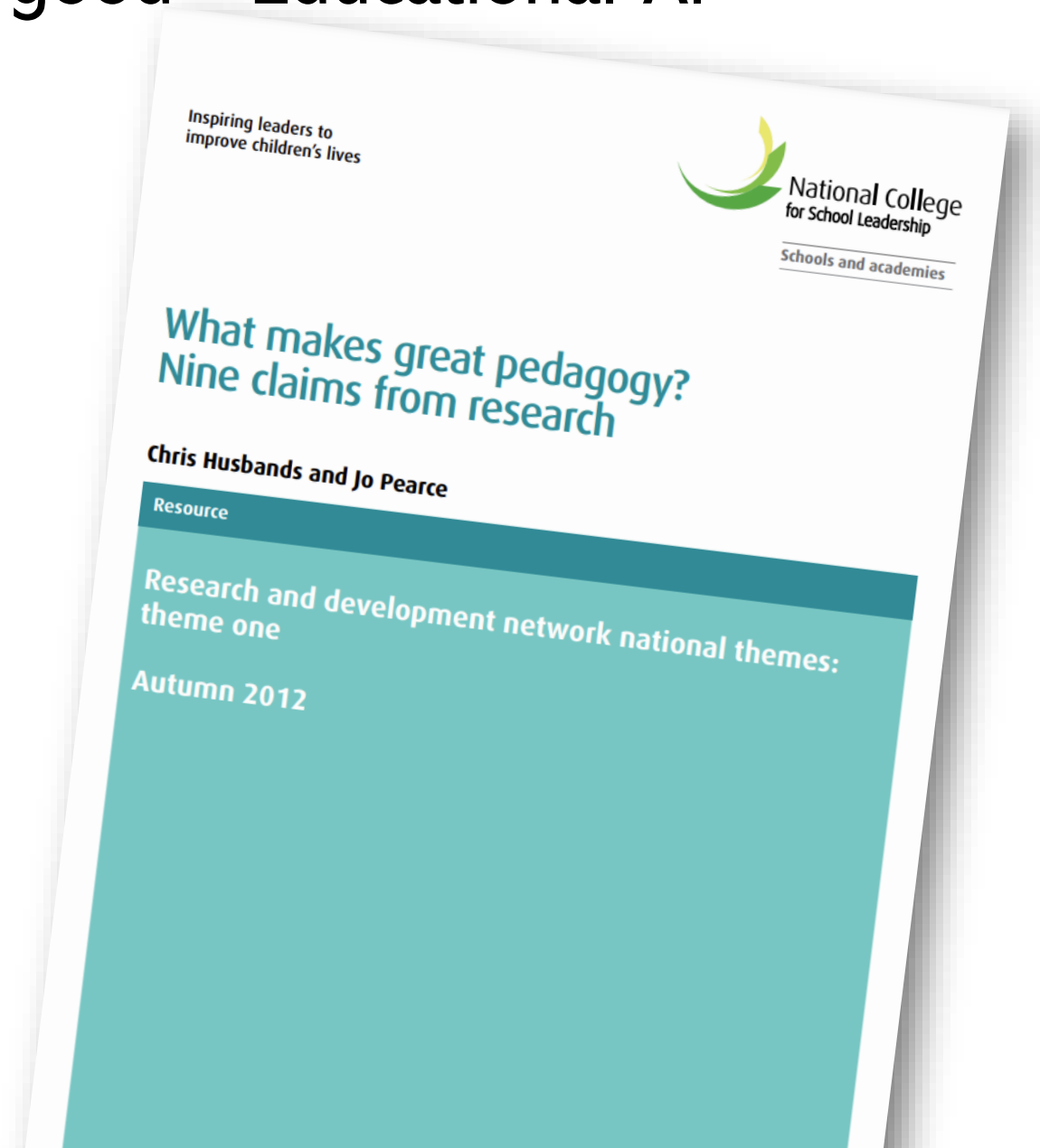


# We need collectively to develop good “Educational AI”

We should work with AI companies to build models based on good pedagogy and inclusive education,

e.g. “Choose the response that explains step-by-step how you arrive at the answer”

“Choose the response that encourages reflection and critical thinking”



# Oxford?



## **Oxford experts are applying AI to society's greatest challenges.**

They're using artificial intelligence to tackle global health issues, from identifying psychiatric disorders to predicting the spread of future pandemics.

Researchers are using AI to curate exhibitions and compose symphonies, monitor the illegal wildlife trade and look for life on Mars.

They're analysing the impact of artificial intelligence on the workplace and leading the way in exploring the ethical issues of AI's impact on humanity.



## **Global health, medicine and disease.**

<https://oxford.shorthandstories.com/ai-how-is-it-being-used-at-oxford/index.html>



# Resources

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

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