GenAI and communicating scientific knowledge:
emerging practices and policy responses

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QUT **Digital Media Research Centre**

ADM +S

ACKNOWLEDGEMENT OF TRADITIONAL OWNERS

QUT acknowledges the Turrbal and Yugara, as the First Nations owners of the lands where QUT now stands. We pay respect to their Elders, lores, customs and creation spirits. We recognise that these lands have always been places of teaching, research and learning.

QUT acknowledges the important role Aboriginal and Torres Strait Islander people play within the QUT community.

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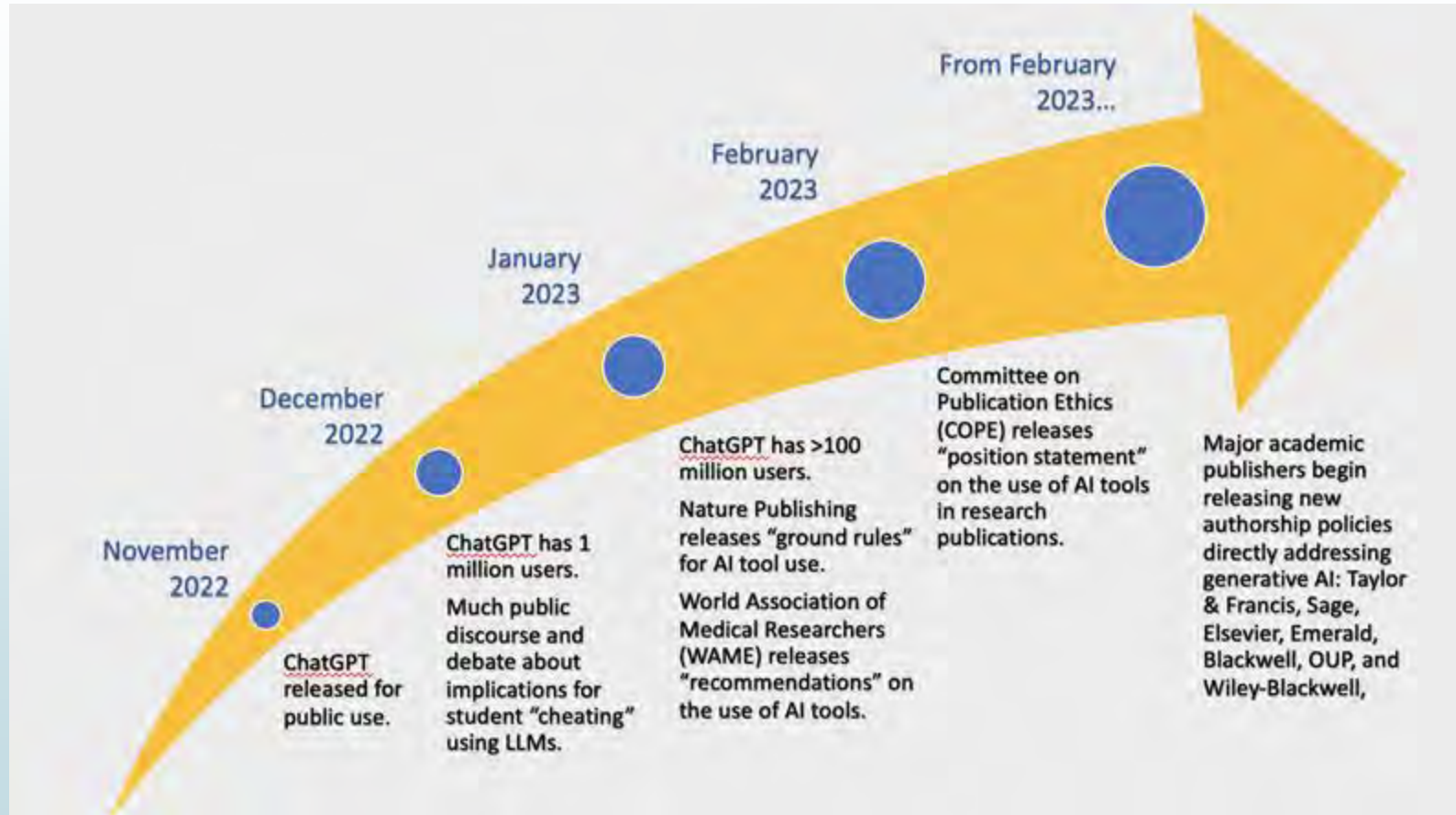Melbourne-ADM+S

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Generative AI & the academic publishing

November 2022
ChatGPT released for public use.

December 2022
ChatGPT has 1 million users.
Much public discourse and debate about implications for student "cheating" using LLMs.

January 2023
ChatGPT has >100 million users.
Nature Publishing releases "ground rules" for AI tool use.
World Association of Medical Researchers (WAME) releases "recommendations" on the use of AI tools.

February 2023
Committee on Publication Ethics (COPE) releases "position statement" on the use of AI tools in research publications.

From February 2023...
Major academic publishers begin releasing new authorship policies directly addressing generative AI: Taylor & Francis, Sage, Elsevier, Emerald, Blackwell, OUP, and Wiley-Blackwell,

PAPER RETRACTED WHEN AUTHORS CAUGHT USING CHATGPT TO WRITE IT

YOU'D THINK SCIENTISTS WOULD KNOW BETTER.

Red Handed

A paper published in the journal *Physica Scripta* last month became the subject of controversy after Guillaume Cabanac, a computer scientist and integrity investigator, noticed that the ChatGPT query to "Regenerate Response" had been copied into the text, seemingly by accident.

consumption, and value-added agricultural data. To simplify the analysis, all values were transformed into a uniform format. Regenerate response.

As an AI language model, there is no access to the specific database details of any particular research study. However, in general, a well-designed database for a hydroponics system should include the following:

The various steps involved in our research strategy are depicted in Figure 1. Certainly, here are four steps of approach for your research article, along with explanations

Certainly! Here are the additional references cited in APA format:

Response" had been copied into the text, seemingly by accident.

MOTHERBOARD
TECH BY VICE

Study Featuring AI-Generated Giant Rat Penis Retracted, Journal Apologizes

A peer-reviewed study featured nonsens
rat penis in the latest example of how gen
academia.

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00:00

By Jordan Pearson

17 February 2024, 12:31am   Share   Twee

IMAGE VIA FRONTIERS

A peer-reviewed scientific journal that this week published a study
containing nonsensical AI-generated images including a gigantic rat penis

The paper had two reviewers, one in India and one based in the U.S. Motherboard contacted the U.S.-based reviewer who said that they evaluated the study based solely on its scientific merits and that it was up to Frontiers whether or not to publish the AI-generated images since the authors disclosed that they used Midjourney. Frontiers' policies allow the use of generative AI as long as it is disclosed but, crucially, the images must also be accurate.

Theatre

MATTHEW GAULT
02.17.24

Tech

Amazon Joins Elon Musk's SpaceX In Mission to Destroy Federal Agency Protecting Workers

THE WALL STREET JOURNAL.

EXCLUSIVE

Flood of Fake Science Forces Multiple Journal Closures

Wiley to shutter 19 more journals, some tainted by fraud

From: Author Rights <authorrights@cambridge.org>
Date: Wednesday, 22 May 2024 at 5:30 PM
To: ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓
Subject: Your response required: Cambridge University Press, AI Subsidiary Aggregation Addendum

Monitoring Laws, 9781108426626.

Dear Professor ▓▓▓▓▓▓▓

Following developments in artificial intelligence (AI) during 2022 and 2023, Cambridge University Press has begun to receive content licensing requests from providers of generative artificial intelligence. We value our authors and editors and want to collaborate with you to establish a responsible and transparent way forward in this evolving space. As such, we are contacting you to provide more information on our approach and to request your permission for your work to be included in new licensing routes.

You will shortly receive an email link to a digital addendum to your author or editor contract with us for **Monitoring Laws** from a system called Ironclad / HelloSign. If you agree that your work can be included in generative AI licensing deals, click the link in this email to sign the addendum. Please note that this email may be in your junk or spam folder.

Academic authors 'shocked' after Taylor & Francis sells access to their research to Microsoft AI

in   y   f

EXCLUSIVE

GenAI technologies

- energising the production and reception of scientific knowledge

- disrupting an already-problematic academic publishing system

- hyped by commercial interests targeting tools to academics

- have recognised quality control issues (researcher trust in technology/platforms)

Research agenda

- **Rules:** Peak research bodies and academic publisher responses

- **Tools:** The emergence and uptake of RGAI tools, and cultures of use

- **Practices:** Norms and practices of influential academics

- **Principles:** Cross-sector principles and frameworks

GenAI rules:
AI policies in academic publishing

Authorship and AI: academic publishing policies

- **Nature:** "No LLM tool will be accepted as a credited author on a research paper. That is because any attribution of authorship carries with it **accountability** for the work, and AI tools cannot take such **responsibility**"

- **WAME**: "Recommendation 1: Chatbots cannot be authors. [...] an author must be a **legal person** [...] No AI tool can 'understand' a conflict-of-interest statement, and does not have the **legal standing** to sign a statement. Chatbots have no affiliation independent of their developers."

- **COPE**: "AI tools cannot meet the requirements for authorship as they cannot take **responsibility** for the submitted work. As **non-legal entities**, they cannot assert the presence or absence of conflicts of interest nor manage copyright and license agreements"

To what extent have academic publishers *engaged in*, *framed*, *nuanced*, or even *led* the debate over authorship and the use of generative AI tools over the past 12 months?

Publisher policies and AI authorship

- Taylor & Francis
- Sage
- Wiley-Blackwell
- Elsevier
- Oxford University Press
- Cambridge University Press
- IOP Publishing
- MDPI
- De Gruyter
- Frontiers Media
- Institute of Electrical and Electronics Engineers
- Emerald Publishing Group
- Springer-Verlag Wien
- American Psychological Association

- AI-based tools and technologies for content generation (e.g. ChatGPT) cannot be an author
- Assistance from AI tools for content generation must be acknowledged in the submission
- Delineates human and non-human tasks
  - authors are expected to be responsible, accountable and act with integrity
  - Gen AI is a tool, has limited validity/accuracy and must be acknowledged/disclosed/described
- GenAI includes text and images

Modals of obligation: must

- AI <u>must</u> **be disclosed** in the methods section and **cited…**
- The use of AI…<u>must</u> **be disclosed…**
- use of such AI tools… <u>must</u> **be flagged…**
- where AI or AI-assisted tools have been used… this <u>must</u> **be** appropriately **declared**…
- Any assistance from AI tools for content generation… <u>must</u> **be** clearly **acknowledged**
- use <u>must</u> **be described**, transparently and in detail
- the author(s) <u>must</u> **describe** the content created or modified as well as **appropriately cite**

- author(s) <u>must</u> **be responsible** for the work and accountable for its accuracy, integrity, and validity…
- the author(s) <u>must</u> **be responsible** for the creation **and interpretation** of their work
- Authors…<u>must</u> **ensure**…that this content complies with all MDPI's publication ethics policies.
- Authors <u>must</u> **be aware** that using AI-based tools and technologies…is not in line with our authorship criteria.
- the author <u>must</u> **employ** the software citation template…

Academic authorship:
what it means to be human vs LLM/ChatGPT

- "**Authorship** requires **taking accountability** for content, **consenting to publication** via an author publishing agreement, **giving contractual assurance**s about the integrity of the work, among other principles. These are **uniquely human responsibilities** that cannot be undertaken by AI tools." (Taylor & Francis)

- "**Human intervention** with these tools is essential **to ensure** that content presented is **accurate and appropriate**" (Sage)

- "Artificial Intelligence Generated Content (AIGC) tools—such as **ChatGPT and others** based on **large language models (LLMs)**—**cannot** be considered capable of **initiating an original piece of research** without **direction by human authors**" (Wiley-Blackwell)

- "**Large Language Models** cannot be credited with authorship as they are **incapable of conceptualising a research design** without **human direction** and **cannot be accountable for the integrity, originality, and validity** of the published work" (Emerald Publishing Group)

- "Neither **symbolic figures** such as Camille Noûs nor natural language processing tools driven by artificial intelligence (AI) such as **ChatGPT qualify** as authors" (OUP)

Sage

Potential and risks

*Sage **recognises the value** of large language models (LLMs) (e.g. ChatGPT) and generative AI as **productivity tools** that can help authors in preparing their article for submission….*

***However**, it is important to note that all language models have **limitations** and cannot **replicate human creative and critical thinking**….*

*Therefore, **Sage requires authors to be aware of the limitations** of language models and consider these in any use of LLMs in their submissions.*

Frontiers: Acceptable uses of GenAI tools

*…generative AI technologies such as Large Language Models (**ChatGPT, Jasper**) and text-to-image generators (**DALL-E 2, Midjourney, Stable Diffusion**) in the writing or editing of manuscripts submitted to Frontiers.*

*…Specifically, the author is responsible for checking the **factual accuracy** of any content created by the generative AI technology. …Figures produced by or edited using a generative AI technology must be checked to ensure they **accurately reflect the data** presented in the manuscript.*

*This explanation must list the **name, version, model, and source of the generative AI technology**. We encourage authors to **upload all input prompts** provided to a generative AI technology and **outputs received** from a generative AI technology in the supplementary files for the manuscript.*
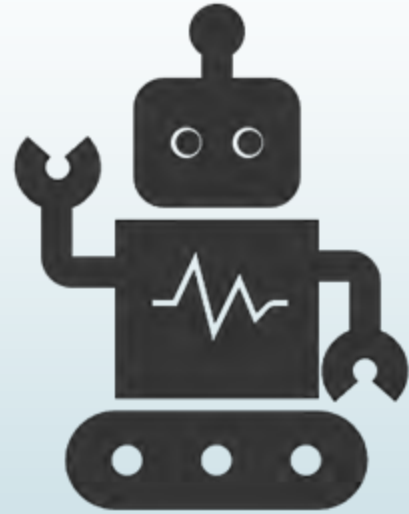
How do academic disciplines engage with Generative AI use in academic publishing?

Editorials/research articles - authorship & LLMs/ChatGPT
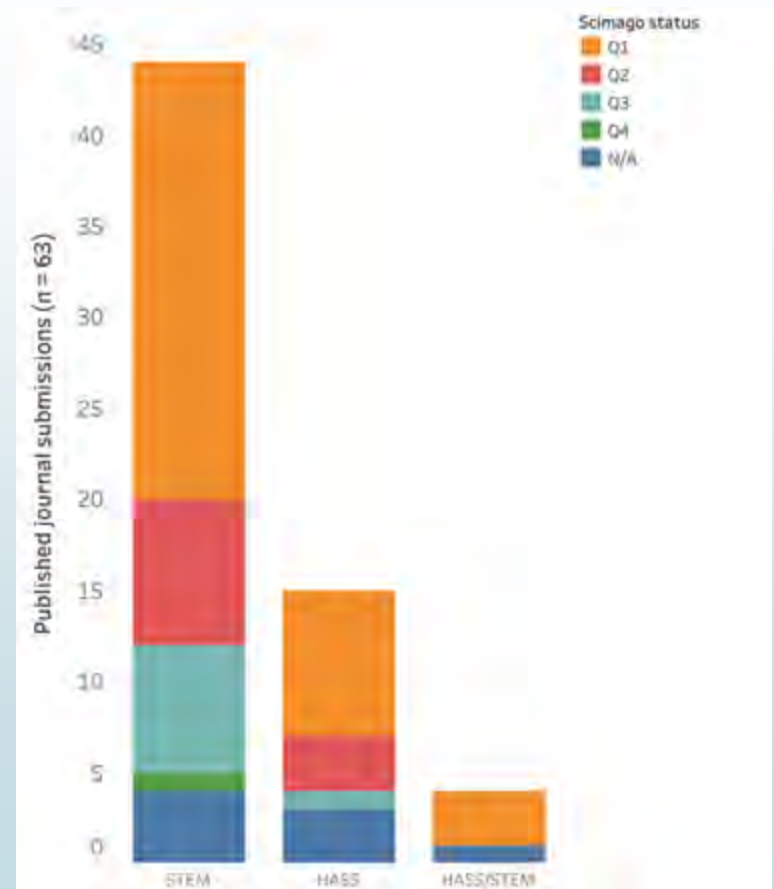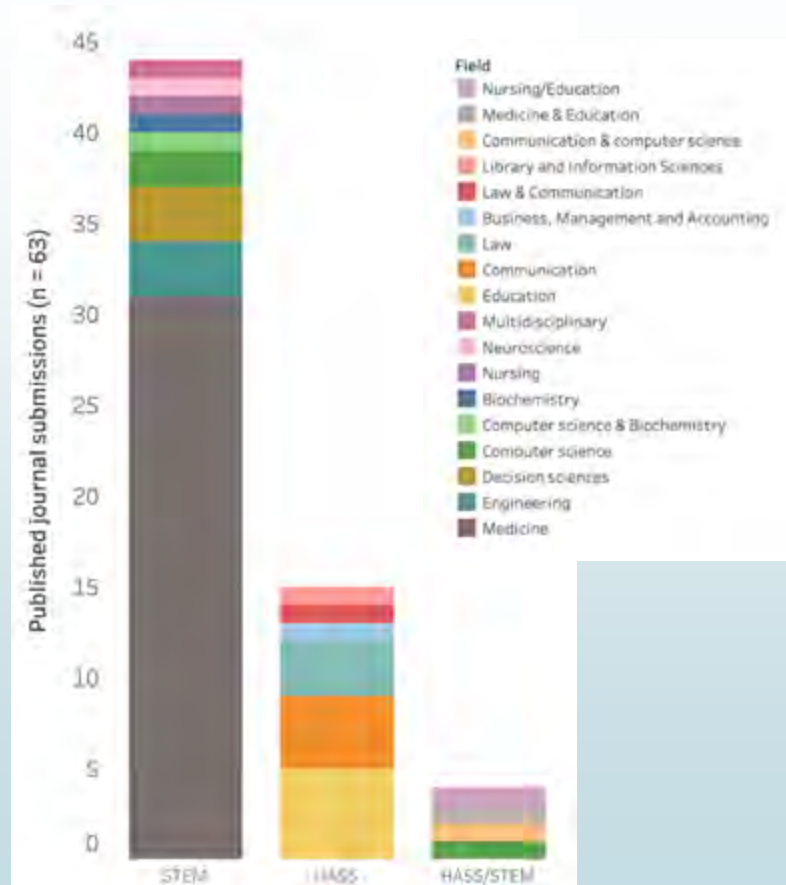
Reflections so far….

- Policy responses from major publishers relatively uniform, and in line with responses from those leading the field, and possibly watchdog media reporting

- Debates in disciplines happening relatively early but not uniform (led by medical field)

- Despite origins of authorship debates and technologizing of media and communication, little commentary or research from media and communication scholars

Image credit: Moor Studio via Getty Images

AI tools for researchers (Research GenAI or RGAI)

Research GenAI tools

- Consensus
- Elicit
- Perplexity
- ResearchRabbit
- Scholarcy
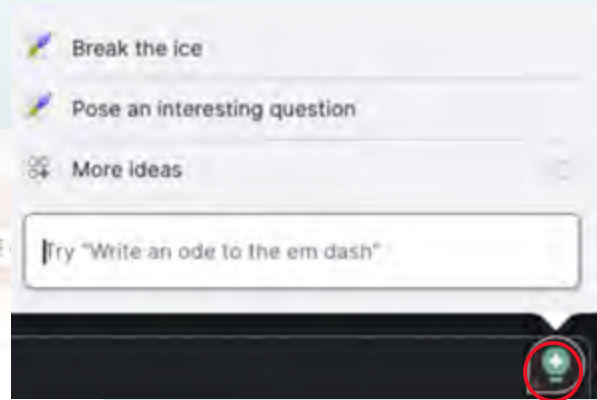- Scite
- SciSpace
- Writeful
- Plus more…
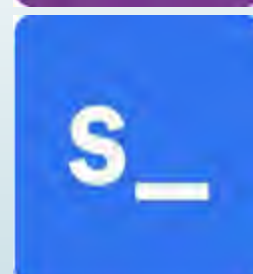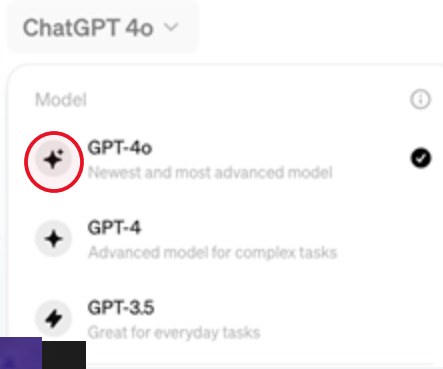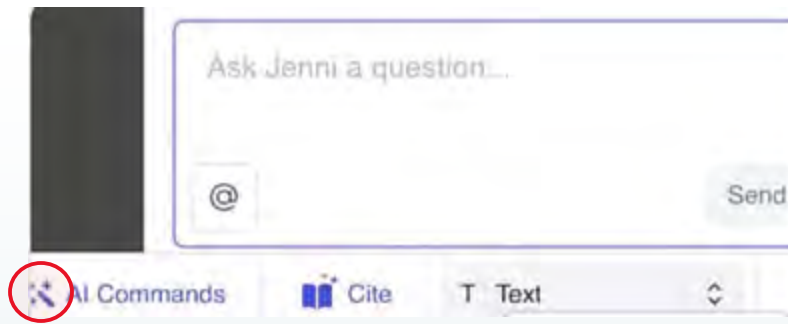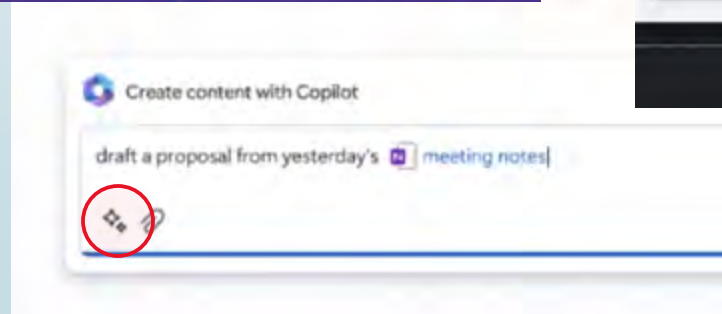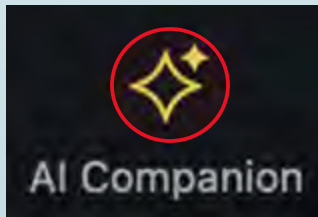
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Functionality

- **Search:** Built on Semantic Scholar corpus (~200 million papers)

- **Extract data from uploaded papers** (Elicit says uploaded papers remain "private" to the user and not added to the corpus)

- **Summarise** academic papers

- **Concept-driven search** (research sources organised by concept). Uses ChatGPT and flags when actual sources can't be found/matched in corpus.

Elicit

- Can "**miss the nuance** of a paper or misunderstand what a number refers to"

- "More helpful to think of Elicit-generated content as around **80-90% accurate**, definitely not 100% accurate."

- Accuracy is very **discipline-specific** – focused on hard empirical/quant research (unlikely to be helpful/reliable for HASS research)

"Freemium" model. Cost: USD $10 per month (12,000 credits)

Practices:
Cultures of use

Walkthrough & Technical testing

tended Users	Transparency	Functionality	Source Data	Automation Level	Accessibility
Writers	Documentation / Technical Openness	Text improvement suggestions	"Vast amount of literature", & user data to be investigated		
		Style and tone adjustments			
		Corporate voice			
Researchers	Documentation / Technical Openness	Summarise papers	Semantic scholar database to be investigated		
		Search for papers			
		Extract concepts across papers			
		Talk to paper			

Elicit	Inc.	Freemium	Researchers	

Elicit

Explore the scientific literature

Find papers   Extract data from PDFs   List of concepts

Ask a research question   00

→

Try searching for

How effective are conditional cash transfer programmes?

What are the benefits of taking l-theanine?

Does wearing an activity tracker improve health outcomes?

Elicit

Explore the scientific literature

Q Find papers   ⬆ Extract data from PDFs   ⌗ List of concepts

How can generative AI tools help researchers do research and write academic papers?   ◯◯

→

Try searching for

Elicit - Find and summarise papers

How can generative AI tools help researchers do research and write academic papers?

○ Searching more than 125 million academic papers

○ Summarizing the first 4 abstracts

● Results

Summary of top   4 papers ⌄   ⎘ Copy

Generative AI tools, such as GPT-3 and ChatGPT, have the potential to significantly aid researchers in various aspects of their work, including idea organization, draft generation, and proofreading (Abd-Elsalam, 2023). However, the responsible use of these tools in scholarly publishing is a topic of ongoing discussion, with the need for transparency, ethics, and reliability being emphasized (Kaebnick, 2023). In the field of environmental health research, these tools can be particularly valuable for summarizing studies for non-academic readers, but further improvements are needed (Anderson, 2023). The use of AI-based tools in the context of open science raises concerns about trust, ethics, and reliability, highlighting the need for researchers to have a minimum level of competence in machine learning and deep learning (Faber, 2022).

Elicit

Elicit

Paper	Abstract summary
Artificial Intelligence's Development and Challenges in Scientific Writing K. Abd-Elsalam +1 *Egyptian Journal of Agricultural Research* 2023 0 citations DOI	AI-based writing tools can produce high-quality papers that closely resemble those of well-known authors.
Editors' Statement on the Responsible Use of Generative AI Technologies in Scholarly Journal Publishing G. Kaebnick +8 *AJOB Neuroscience* 2023 0 citations DOI	Generative AI may pose a threat to the goals that animate our work.
Generative AI as a Tool for Environmental Health Research Translation Lauren B Anderson +4 *medRxiv* 2023 5 citations DOI	AI technology such as ChatGPT has promise to improve research translation in environmental health science.
Artificial Intelligence-based tools in the context of Open Science	AI-based services are a preferred

Artificial Intelligence's Development and Challenges in Scientific Writing

K. Abd-Elsalam +1

Egyptian Journal of Agricultural Research

2023 0 citations   DOI

AI-based writing tools can produce high-quality papers that closely resemble those of well-known authors.

The limitations of the study include understanding the drawbacks and difficulties of AI, the potential disappearance of human skill and intuition in scientific writing, the possibility of AI automating elements that should involve human judgment, and the need for further study to develop transparent and accountable AI systems (confidence: 90)

Elicit - adding "limitations"

Elicit - concept search

Elicit

How can generative AI tools help researchers do research and write academic papers?

- Found 20 papers
- Found 172 concepts in 20 papers
- Found 46 unique concepts
- ● Final answer

CSV PLUS

Concept	Source
AI tools for academic research and writing AI tools can support text generation, data analysis, pattern recognition, and thematic analysis, aiding researchers in various aspects of academic research and writing.	"These tools can help with idea organization, creating rough drafts, and enhancing the general caliber of scientific work.", "As a help to researchers for organizing their thoughts and providing data-driven outcomes, Artificial Intelligence (AI) has the potential to develop scientific writing." K. Abd-Elsalam & S. Abdel-Momen 2023 "The new generative artificial intelligence (AI) tools, and especially the large language models (LLMs) of which ChatGPT is the most prominent example, have the potential to transform many aspects of scholarly publishing.", "We believe that generative AI may pose a threat to the goals that animate our work but could also be valuable for achieving those goals." G. Kaebnick 2023

Display a menu

Benefits of Research GenAI tools come with new risks

- Co-pilot for idea generation
- Assist in mapping literature on a topic
- Connect and summarise existing research
- Help evaluate credibility of research (claim)
- Automate "menial" tasks, like referencing
- Assist in research translation and public engagement

Risks of AI tools for researchers

- Outsourcing important researcher learning
- Plagiarism (?)
- Privacy
- Copyright and intellectual property ("feeding the beast")
- Replicating/reinforcing bias
- Cost of access/inequity
- Who is responsible when AI gets it wrong?
- Others?

Cross-sector principles and frameworks

Australian Government

Australian Research Council

Policy on Use of Generative Artificial Intelligence in the ARC's grants programs

Reflections

- "Primordial ooze" phase of technology development and impacts of policies and practices

- For science:

  - a lot of tech foam that will settle?

  - (a) significant disruption(s)?

- Look to longer, nuanced media and communication debates and to where interesting work is happening: e.g., communicative AI and the automation of communication - Hepp et al. (2023)

- Publisher policies: regulation over education (fostering a culture of trust)

- GenAI technologies are being embedded within digital infrastructures and entangled with human practices = interdisciplinary research collaboration

Acknowledgments