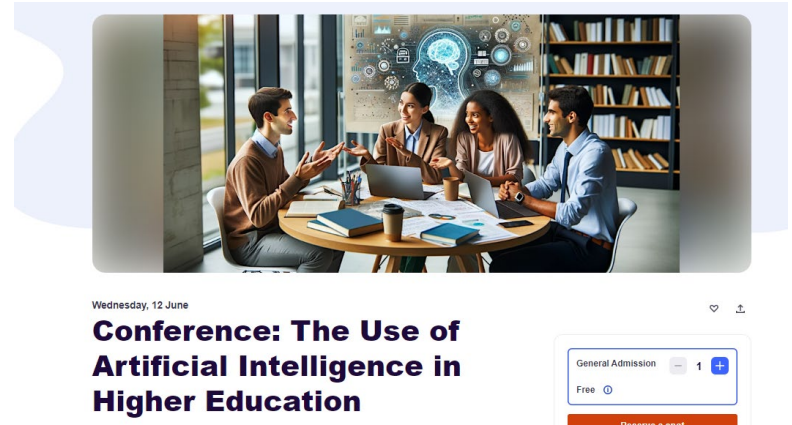


# Generative AI in PGR: Tips and Tools

Jane Wellens, Head of the Graduate School

# BACKGROUND

- Advance HE 2023 Collaborative Development Fund project on **GenAI in Research** (Jan – June 24)
- Series of Workshops and Webinars for PGRs and Supervisors
  - What is GenAI?
  - Using GenAI in the literature review
  - Reviewing and repurposing your research using GenAI
  - Practical applications of GenAI for researcher career development
  - Using GenAI in qualitative research

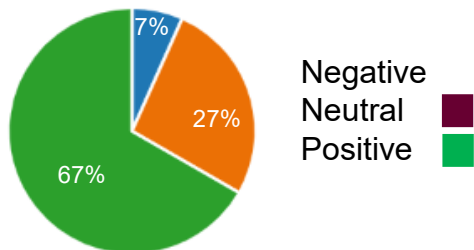


# PRE-WORKSHOP SURVEY

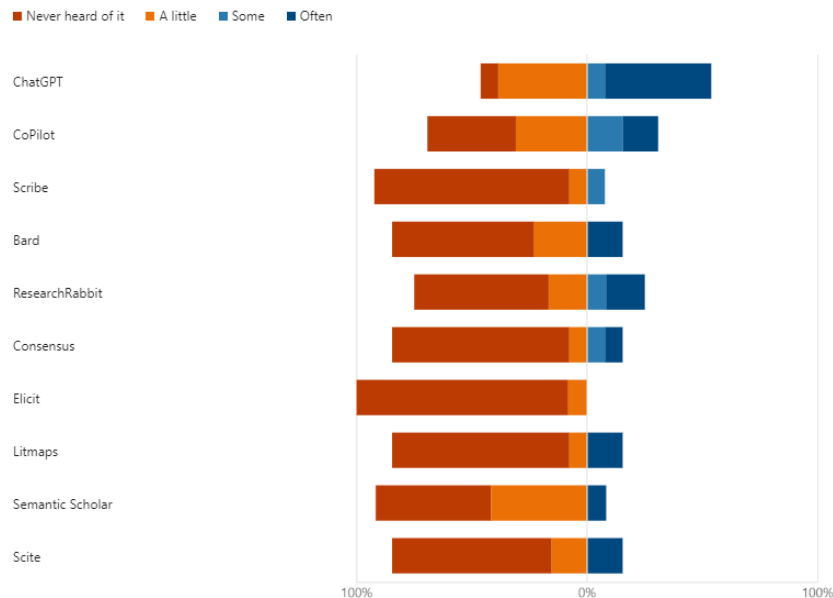
Which of the following best describes your use of GenAI to date

Had never used GAI	12%
Had 'played' with GAI to see what the fuss is about	41%
Had experimented with GAI and used it for a few activities	18%
Regularly use GAI for support	18%

Overall, what impact do you think GAI will have on research practice?



To what extent have you used/do you use the following GenAI tools to support your research?



# PRE-WORKSHOP SURVEY

- Even split between PGRs and academic staff
- Majority from social sciences and humanities disciplines
- Academics included ECRs and those with 10+ years research experience
- PGRs from all years of study
- 80% over 30 years of age
- Wanted to gain better understanding of:
  - How GenAI works (bias, recognition) and its uses
  - Use of GenAI for specific purposes (data analysis, research outputs)
  - Ensuring robust and ethical research practice.



# **BREAK OUT DISCUSSION**



**Do you think it is acceptable research practice for PGRs to use AI tools to:**

- 1. Improve writing**
- 2. Translate materials**
- 3. Support academic literature reviews**
- 4. Troubleshoot coding bugs**

# GUIDANCE ON AI FOR PGRS OR AI RESEARCH PRACTICE

Increasing number of institutions, publishers and funding organisations have published information on the use of AI in relation.

Eg.

University of Birmingham - [Student and PGR guidance on using GenAI tools ethically for work](#)

University of Leeds – [AI for Researchers](#)

University of Glasgow – [Generative AI Guidance for Researchers](#)

UKRI [Use of generative artificial intelligence in application preparation and assessment](#)

# Living guidelines on the Responsible Use of GAI in Research



**First published in March 2024**

**Includes:**

**2.1 Recommendations for Researchers**

**2.2 Recommendations for Research Organisations**

**2.3 Recommendations for Research Funding Organisations**

# Recommendations for Researchers

**For generative AI to be used in a responsible manner, researchers should:**

## **1. Remain ultimately responsible for scientific output**

- a) Researchers are accountable for the integrity of the content generated by or with the support of AI tools.
- b) Researchers maintain a critical approach to using the output produced by GAI and are aware of the tools' limitations, such as bias, hallucinations and inaccuracies.
- c) AI systems are neither authors or co-authors. Authorship implies agency and responsibility, so it lies with human researchers.
- d) Researchers do not use fabricated material created by GAI in the scientific process, for example falsifying, altering or manipulating original research data.

## **2. Use generative AI transparently.**

- a) Researchers to be transparent, detail which GAI tools have been used substantially in their research processes. References to the tool could include the name, version, date, etc and how it was used and affected the research process. If relevant, researchers make the input (prompts) and output available, in line with open science principles.
- b) Researchers take into account the stochastic (random) nature of GAI tools, which is the tendency to produce different output from the same input. Researchers aim for reproducibility and robustness in their results and conclusions. They disclose or discuss the limitations of GAI tools used, including possible biases in the generated content, as well as possible mitigation measures.

# Recommendations for Researchers

## **3. Pay particular attention to issues related to privacy, confidentiality and intellectual property rights when sharing sensitive or protected information with AI tools.**

- a) Researchers remain mindful that generated or uploaded input (text, data, prompts, images etc.) could be used for other purposes, such as the training of AI models. Therefore, they protect unpublished or sensitive work, by taking care not to upload it into an online AI system unless there are assurances that the data will not be re-used eg to train future language models or to the untraceable and unverifiable reuse of data.
- b) Researchers take care not to provide third parties' personal data to online GAI systems unless the data subject has given them their consent and researchers have a clear goal for which the personal data are to be used so compliance with EU data protection rules is ensured.
- c) Researchers understand the technical and ethical implications regarding privacy confidentiality and IPR. They check, for example the privacy options of the tools, who is managing the tool, where the tool is running and implications for information uploaded. This could range from closed environments, hosting on a third-party infrastructure with guaranteed privacy, to open internet-accessible platforms.

# Recommendations for Researchers

- 4. When using generative AI, respect applicable national, EU and international legislation, as in their regular research activities.**
  - a) Researchers pay attention to the potential for plagiarism (text, code, images, etc.) when using outputs from generative AI. Researchers respect others' authorship and cite their work where appropriate. The output of a GAI may be based on someone else's results and require proper recognition and citation
  - b) The output produced by GAI can contain personal data. If this becomes apparent, researchers are responsible for handling any personal data output responsibly and appropriately, and EU data protection rules are to be followed.
- 5. Continuously learn how to use generative AI tools properly to maximise their benefits, including by undertaking training.**
  - a) Generative AI tools are evolving quickly, and new ways to use them are regularly discovered. Researchers stay up to date on the best practices and share them with colleagues and other stakeholders.
- 6. Refrain from using generative AI tools substantially in sensitive activities that could impact other researchers or organisations.**
  - a) Avoiding the use of GAI tools eliminates the potential risks of unfair treatment or assessment that may arise from these tools' limitations (such as hallucinations and bias).
  - b) Moreover, this will safeguard the original unpublished work of fellow researchers from potential exposure or inclusion in an AI model.

# RESEARCHERS ARE AWARE OF THE TOOLS' LIMITATIONS, SUCH AS BIAS

Ask Copilot to create an image of a PhD student studying ... (their choice)

Share the outputs and use these to demonstrate and explore the biases surfaced.

Typical ones include:

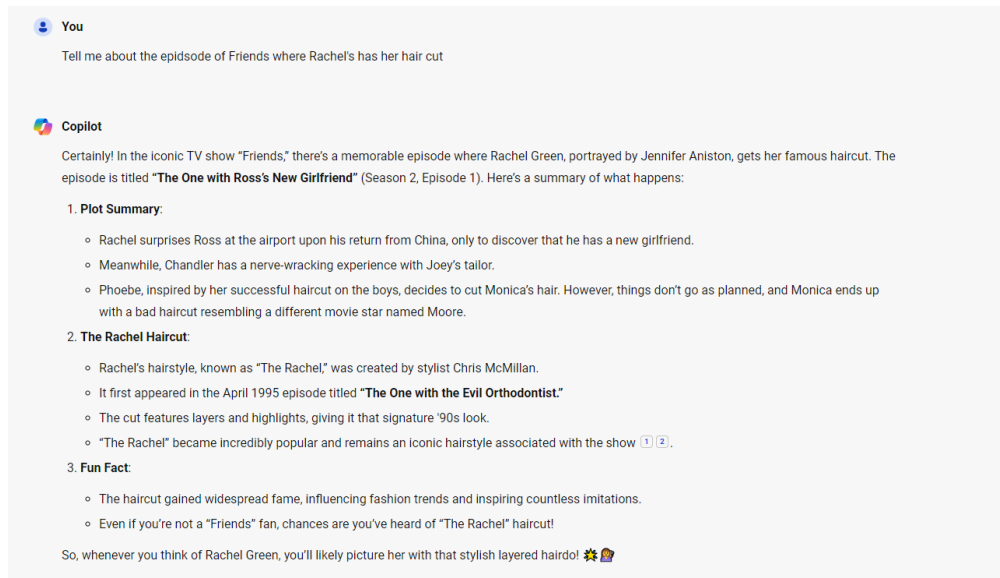
- Nature of PhD study generally
- Demographics of doctoral candidates
- Reinforcement of stereotypes



# RESEARCHERS ARE AWARE OF THE TOOLS' LIMITATIONS SUCH AS HALLUCINATIONS

Gen AI is able to write convincingly about things such as popular TV series but doesn't have the details.

Try asking it to tell you about something that you know didn't happen in particular show.



The screenshot shows a chat interface with a user asking a question and Copilot providing a detailed answer. The user's message is: "Tell me about the episode of Friends where Rachel's has her hair cut". Copilot's response starts with "Certainly! In the iconic TV show 'Friends,' there's a memorable episode where Rachel Green, portrayed by Jennifer Aniston, gets her famous haircut. The episode is titled **'The One with Ross's New Girlfriend'** (Season 2, Episode 1). Here's a summary of what happens:"

1. **Plot Summary:**

- Rachel surprises Ross at the airport upon his return from China, only to discover that he has a new girlfriend.
- Meanwhile, Chandler has a nerve-racking experience with Joey's tailor.
- Phoebe, inspired by her successful haircut on the boys, decides to cut Monica's hair. However, things don't go as planned, and Monica ends up with a bad haircut resembling a different movie star named Moore.

2. **The Rachel Haircut:**


- Rachel's hairstyle, known as "The Rachel," was created by stylist Chris McMillan.
- It first appeared in the April 1995 episode titled **"The One with the Evil Orthodontist."**
- The cut features layers and highlights, giving it that signature '90s look.
- "The Rachel" became incredibly popular and remains an iconic hairstyle associated with the show [1](#) [2](#).

3. **Fun Fact:**

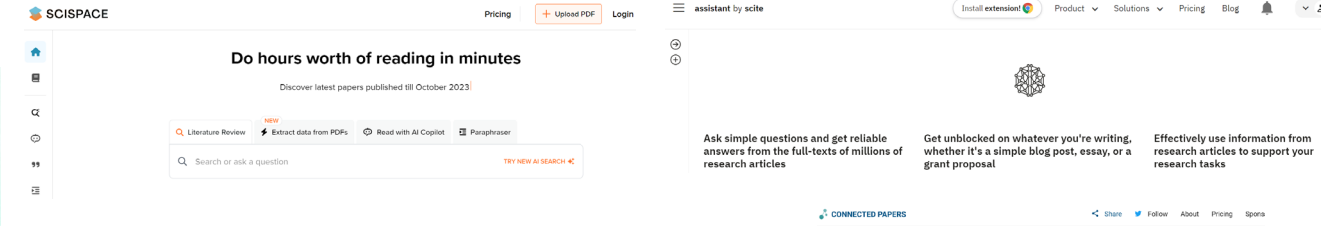
- The haircut gained widespread fame, influencing fashion trends and inspiring countless imitations.
- Even if you're not a "Friends" fan, chances are you've heard of "The Rachel" haircut!

So, whenever you think of Rachel Green, you'll likely picture her with that stylish layered hairdo! ✨👩💇

# Plethora of AI literature review tools/assistants available – what are their advantages and limitations.



Ask a question, get conclusions from research papers



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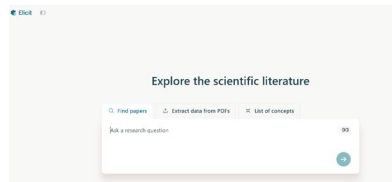
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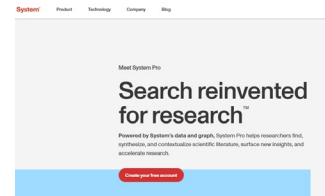


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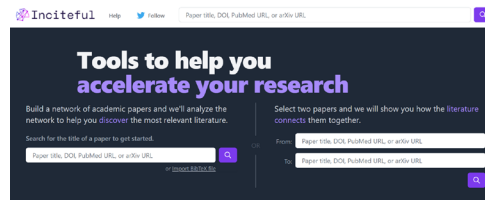
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
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## **Ask PGRs to explore one of the literature review tools in bit more detail**

- **Starting with some literature that they are very familiar with e.g.**
  - something they've authored and published
  - something integral to their current research
- **Consider**
  - what databases are being searched by the tool?
  - the accuracy of any GAI authored summaries (what is informing these e.g. abstract/full paper)
  - the usefulness of any related literature identified
  - reporting features/formats (and how useful you actually find them)

# Comparison of the features of some of the available Generative AI literature review tools

	Databases searched	Offers free subscription/trial	Cost of monthly subscription	Features				
				AI generated summaries/TLDR of papers	Mapping or visualisation	Direct links to articles	Filters	Export Citation Formats
1. Semantic Scholar	Collaboration with a range of academic publishers (500+ journals, 200 million papers), data providers and web crawls	Free & open for all to use Offers Open Athens login	Free	Yes of individual papers	Basic – related papers	Open access ones. Otherwise abstracts.	<ul style="list-style-type: none"> <li>Field of Study</li> <li>Date range</li> <li>PDF</li> <li>Author</li> <li>Journals/Conference</li> </ul>	<ul style="list-style-type: none"> <li>BibTex</li> <li>Endnote</li> <li>Bulk export supported</li> </ul>
2. Consensus	Uses Semantic Scholar with GPT-4 and proprietary LLM analysis.	Free with 10 searches per month	\$8.99	Creates synthesis of top papers with links to source paper.. TLDR of each paper Study snapshot	No	Open access ones. Otherwise abstracts.	Can create custom filters	<ul style="list-style-type: none"> <li>.RIS</li> <li>.CSV</li> </ul>
3. SciSpace	Not detailed.	Free version with limited functionality	\$12.00	Creates synthesis of top papers. TLDR of each paper	No	Open access ones. Otherwise abstracts.	Can create custom filters	Only with subscription CSV, BIB, RIS, XML
5. Elicit	Semantic Scholar	Free version with limited functionality	\$12.00	Creates synthesis of top papers. TLDR of each paper	Citation graph	Open access ones. Otherwise abstracts.	Can create custom filters	Only with subscription RIS, CSV. BIB

# Comparison of the features of some of the available Generative AI literature review tools

	Databases searched	Offers free subscription/trial	Cost of monthly subscription	Features				
				AI generated summaries/TLDR of papers	Mapping or visualisation	Direct links to articles	Filters	Export Citation Formats
5. Scite	1.2 Billion Citation Statements 187 million papers.	7 day free trial (gets extended for further 7 days)	£8.48	Creates synthesis of top papers. TLDR of each paper Citation statements/context	Yes	Full text and meta data through indexing agreements with publishers	<ul style="list-style-type: none"> <li>Similar to above but also includes Citation Filters:</li> <li>Supporting</li> <li>Mentioning</li> <li>Contrasting</li> </ul>	RIS Bib CSV
6. ResearchRabbit	Semantic Scholar and Pubmed	Free	Free	Abstracts	Yes - Provides detailed maps of the connections between papers	Open access ones. Otherwise abstracts.	Date range Prior work Derivative work	RIS Bib CSV
7. Connected Papers	Semantic Scholar	Free (5 graphs/month)	\$6.00	Abstracts	Yes - Provides detailed maps of the connections between papers	Open access ones. Otherwise abstracts.	Date range Prior work Derivative work Similarity	Graph only
8. Litmaps	Crossref Semantic Scholar Open Alex	Free with limited features	\$10.00	Abstracts	Yes - Provides detailed maps of the connections between papers	Open access ones. Otherwise abstracts.	Date range Reference count Citation count Prior work Derivative work	Graph only
9. Inciteful	Crossref Semantic Scholar Open Alex	Free	Free	Abstracts	Yes - Provides detailed maps of the connections between papers	Open access ones. Otherwise abstracts.	Keywords Distance Date range Most important Review papers	Graph only

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