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FAST-TRACK YOUR RESEARCH WITH GENAI: ESSENTIAL TOOLS AND BEST PRACTICES FOR RESPONSIBLE USE

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Abstract

Higher education faculty often juggle an array of tasks, including teaching, student support, administrative tasks, and research—a workload that GenAI tools could help streamline. This workshop zooms in onto the research applications of GenAI. It sets out to explore which GenAI tools can increase productivity at every stage of the research process, while also paying due attention to concerns regarding responsible use. The aims of the workshop are: a) to explore and experiment with dedicated GenAI tools such as Google NotebookLM, Elicit, Perplexity, Consensus, Semantic Scholar, Research Rabbit, Scite, LitMaps, Scholarcy, Inciteful, Quillbot, Writeful, Connected Papers, ChatPDF, TLDRthis, Jenni and scispace AI; b) to determine where they best fit in the research workflow (brainstorming, scoping, finding and screening literature, summarizing, writing, revising and publishing); c) to canvas and evaluate the tools on essential criteria such as usability, reliability, cost, and adaptability; and d) to consider best practices for responsible use focusing on such concerns as data privacy, publishers' guidelines and bias. Through guided and hands-on activities, participants will collectively build a matrix of tool-specific use cases, pros and cons of each tool, and a set of best practices for responsible and effective GenAI integration. By the workshop's end, attendees will be equipped to incorporate GenAI tools thoughtfully into their research, maximizing benefits while navigating potential risks.

Keywords: *Artificial Intelligence, Generative AI, research, responsible use, GenAI.*

1. Introduction

Higher education faculty often struggle to live up to their many daily tasks, including teaching, student support, administrative work, and research—a balancing act that has become increasingly challenging in recent years. While all these responsibilities compete for limited time and attention, research activities in particular require sustained focus and systematic effort across multiple stages: from initial literature review and hypothesis formation to data collection, analysis, and manuscript preparation. The emergence of Generative Artificial Intelligence (GenAI) tools presents a potential opportunity to streamline these research workflows and enhance productivity (Bolaños et al., 2024; Wagner et al., 2021). However, their integration into research practices raises important questions about responsible use, academic integrity, and the maintenance of scholarly standards. Faculty members need guidance on how to leverage these tools effectively without disregarding ethical principles and institutional policies.

This workshop addresses this critical need by examining several GenAI tools across the research lifecycle. The tools under review include Google NotebookLM, Elicit, Perplexity, Consensus, Semantic Scholar, Research Rabbit, Scite, LitMaps, Scholarcy, Inciteful, Quillbot, Writeful, Connected Papers, ChatPDF, TLDRthis, Jenni and scispace AI. Through collaborative assessment, attendees will apply a systematic protocol to evaluate each tool's usefulness, usability, accessibility, adaptability, reliability, and privacy/security features.

2. Review protocol

Step 1: Preparation

1. Access the Tool
   Visit the tool's website or platform and sign up/log in if required.
   Ensure you can access all features available under the free version (if applicable).
2. Familiarize Yourself
   Read the tool's description, purpose, and features.

Watch any introductory videos or browse FAQs/tutorials for a basic understanding.

Step 2: Evaluate Usefulness

1. Task Alignment
   Identify which stage(s) of the research workflow the tool targets (e.g., brainstorming, literature review, writing).
   Test whether the tool fulfills this role effectively using a simple research task. Example: Use a brainstorming tool to generate ideas for a specific topic. Use real cases from your research field.
2. Value Addition
   Does the tool provide a clear benefit over "traditional" methods?
   Are its features relevant and unique for researchers in your field?
   Compare output quality to human baseline performance.
   Assess time saved versus time invested in learning/using the tool.
4. Limitations
   Note any features that are missing or underwhelming.
   Document any (discipline-specific) limitations.

Step 3: Assess Usability

1. Interface and Navigation
   Is the interface intuitive? Can you perform basic tasks without significant guidance?
   Are menus, buttons, and features clearly labeled and easy to find?
2. Learning Curve
   How quickly did you understand how to use the tool?
   Are there any features or workflows that felt confusing or cumbersome?
3. Support
   Check if there are tutorials, user guides, or a help center available.
   Evaluate the quality and accessibility of support resources.

Step 4: Analyze Cost

1. Free vs. Paid Features
   What functionality is available for free?
   Are any critical features locked behind a paywall?

Step 5: Examine Adaptability

1. Customization
   Can you tailor the tool to suit your specific needs or preferences?
   Example: Adjusting search parameters, modifying outputs.
2. Integration
   Does the tool integrate with other research software or platforms (e.g., Mendeley, Zotero, Microsoft Word)?
   Are there export/import options for data or results?
3. Flexibility Across Disciplines
   Does the tool cater to a range of academic fields, or is it more specialized?
   Document any discipline-specific adaptations or limitations.

Step 6: Evaluate Reliability

1. Performance
   Are the results consistent when performing similar tasks?
   Note any bugs, crashes, or issues encountered during use.
2. Accuracy
   If applicable, compare the tool's output with known reliable sources to check for errors or misinterpretations.
   Test reproducibility: can you get similar results with similar inputs?
   Document any instances of AI hallucination or fabrication.

Step 7: Privacy and Security

1. Data Usage
   What personal or research data does the tool request or collect?
   Are data usage terms transparent and easy to understand?
2. Compliance
   Does the tool comply with relevant data protection guidelines?

3. Security Measures
   Are there visible measures to secure user data (e.g., encryption, two-factor authentication)?

Step 8: Ethical Considerations
1. Bias Assessment
   If applicable, test for potential biases in outputs.
2. Academic Integrity
   Check alignment with your institutional AI policies and/or with the AI policy of the publisher you wish to submit your research to (e.g., the Elsevier GenAI policy: https://www.elsevier.com/about/policies-and-standards/generative-ai-policies-for-journals)

Step 9: Summarize Findings
1. Score the Tool
   Assign a score (e.g., 1-5) for each criterion based on your observations.
2. Key Insights
   Summarize the tool's strengths and weaknesses.
   Highlight one feature you found particularly useful or problematic.
3. Use Case Analysis
   Identify specific scenarios where the tool excels.
   Document situations where the tool may not be appropriate.
4. Recommendations
   State whether you would recommend the tool for specific research tasks or users.
   Include cost-benefit analysis for different user types.
   Suggest optimal use cases and potential alternatives.

3. Knowledge gained, shared and maintained

The protocol and results are shared through an online collaborative spreadsheet, to which all participants will continue to have access after the workshop. This living document provides a comprehensive overview of available GenAI tools and it will help researchers make informed decisions – both from a practical and an ethical perspective – about which tools might benefit their specific workflows. As new tools emerge and existing ones evolve, our aim is to make this a collaborative resource of "best practices" which continues to grow and inspire the research endeavours of the participants.

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