

MODULE 2A

AI For Research

WORKBOOK

Version: V202308

**APPLIED
ARTIFICIAL
INTELLIGENCE
FOR HIGHER
EDUCATION**

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This workbook is designed for use in Bron Eager training and development workshops.

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Welcome!

Artificial Intelligence (AI) has rapidly emerged as a game-changing technology, holding significant implications for higher education teaching and research. For those who are open to it, AI advancement offers exciting possibilities for new and innovative ways of working.

Yet, venturing into this new world of AI-augmented academic work can be daunting, seemingly filled with intricate details – a mystifying puzzle that's forever taking new forms.

My mission is to remove some of that mystery and share the exciting (and often very easily realised) possibilities that arise when partnering academic skills with AI tools.

While I offer one approach to exploring AI in research and teaching contexts, I definitely don't suggest it as a prescriptive formula. I encourage you to 'go off script', fall down rabbit holes, take twists and turns, and importantly, take your journey at your own pace.

If you find more effective ways of working with AI technologies than I've shared, or discover different or better AI tools, or just want to reach out, please email me at bron@broneager.com or connect on socials.

Like you, I'm still exploring this new world of AI and am always enthusiastic to learn what's working for others. I believe fostering mutual learning and growth is key to successfully navigating this AI landscape we didn't necessarily sign up for but now find ourselves in.

If I could offer just one piece of advice, it is to approach AI with an open and curious mind. And (more) importantly, have some fun with it!

Bron

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Agenda

We'll be exploring the world of AI and AI tools and how they might be practically applied to various research tasks. Emphasis is placed *on learning by doing* and *curious exploration*.

Time	Topic	Activities
9:30-9:45	Welcome!	<ul style="list-style-type: none"> Nice to meet you! Who's in the room? Overview of Today's Agenda + Workbook
9:45-10:15 (30 minutes)	Mapping 'Typical' Pathways To Artefact Creation <i>Small-group activity</i> <i>Class reflection</i>	<ul style="list-style-type: none"> Activity overview: <u>Mapping Your Path</u> Form small groups (2-3 participants) Groups work through the activity <p>OUTCOME: Create a map with which to guide the remainder of today's AI skills-building activities</p>
10:15-11:00 (45 minutes)	AI for Ideation (Research Topics and Questions) <i>Facilitator demonstration</i> <i>Small-group activity</i> <i>Class reflection</i>	<ul style="list-style-type: none"> Facilitator demonstrates using AI for ideating research topics, including abridged AI prompt resources. Activity overview: <u>AI for Idea Generation</u> Groups work through the activity <p>OUTCOME: Groups decide on a broad research topic and draft a title and initial set of research questions with which to advance to the next activity.</p>
Short Break (10-15 minutes)		

Time	Topic	Activities
11:15-12:00 (45-60 minutes)	<p>AI-Powered Literature search</p> <p><i>Facilitator demonstration</i></p> <p><i>Small-group activity</i></p> <p><i>Class reflection</i></p>	<ul style="list-style-type: none"> • Facilitator demonstrates 1-2 AI tools for locating research articles. <ul style="list-style-type: none"> ◦ Selected AI tools: <ul style="list-style-type: none"> ▪ Elicit ▪ Scite ▪ Perplexity ▪ Bard • Explanation of semantic search • Explanation of how to evaluate literature 'quality' • Activity overview: AI-Powered Literature Search • Groups work through the activity <p>OUTCOME: Groups create a (very) small library of research articles (and downloaded associated .pdfs) which they will use AI tools to analyse in the next activity.</p>
Lunch 45-60 minutes		
1:00-1:45 (45 minutes)	<p>Literature Analysis and Synthesis</p> <p><i>Facilitator demonstration</i></p> <p><i>Small-group activity</i></p> <p><i>Class reflection</i></p>	<ul style="list-style-type: none"> • Facilitator demonstrates AI tools for summarising literature, including: <ul style="list-style-type: none"> ◦ Generating individual .pdf summaries ◦ Demonstrate pdf analysis tools ◦ Demonstrate multi-document analysis tools (e.g., Petal.org), including: <ul style="list-style-type: none"> ▪ Article matrix ▪ Custom-trained chatbots / 'Knowledge Base' ▪ Application for data analysis • Activity overview: Literature Summary Matrix <p>OUTCOME: Groups generate article summaries and collate them into a single document.</p>

Time	Topic	Activities
1:45 - 2:30 (45 minutes)	<p>Outline and Populate Artefact</p> <p><i>Facilitator demonstration</i></p> <p><i>Small-group activity</i></p> <p><i>Class reflection</i></p>	<ul style="list-style-type: none"> • Facilitator explanation of 'broad-to-narrow' goal-based instruction. • Overview AI tools for building a draft article structure • Populate artefact structure with previously generated thematic summaries <p>OUTCOME: Create a rough draft of artefact (e.g., literature review)</p>
Short Break (10 minutes)		
2:40-3:00 (20-30 minutes)	<p>Demonstration/ Showcase: AI tools for Writing and Editing</p> <p><i>Facilitator demonstration</i></p> <p><i>Class discussion + Q&A</i></p>	<p>Facilitator explanation of AI for editing, including:</p> <ul style="list-style-type: none"> • Using AI to enhance your writing for: <ul style="list-style-type: none"> ◦ Clarity ◦ 'Academic tone' (plain English!) ◦ Impact ◦ Audience • AI as an editor/reviewer, including: <ul style="list-style-type: none"> ◦ Addressing reviewer/supervisor comments • AI for text generation (first draft!) • Jenni (Note. paid AI tool) <ul style="list-style-type: none"> ◦ tone/style etc. ◦ citation functionality - evidence statements ◦ limitations

Time	Topic	Activities
3:00-3:45 (45 minutes)	<p>Try it Out: Re-Writing / Text Generation</p> <p><i>Small-group activity</i> Or, work on individual writing projects</p> <p><i>Class reflection</i></p>	<ul style="list-style-type: none"> • Facilitator demonstration of AI tools for: <ul style="list-style-type: none"> ◦ Rephrasing text ◦ Generating text, e.g., <ul style="list-style-type: none"> ▪ Conclusions ▪ Abstracts ▪ Other <p><u>RESOURCE: Example AI Prompts for Writing and Editing.</u></p> <p>OUTCOME: Artefact advanced through AI text manipulation and generation functionality.</p>
<p>Group / Individual Project Work</p> <p>Wrap - Final Reflections</p>		
<i>Optional (Time permitting)</i>	AI tools for Crafting Grant Funding Applications	<p>Use .pdf tools to formulate responses to grant applications.</p> <p>Note. AI tools can also be used for promotion applications (e.g., analysing and linking promotion application text to university strategic documents)</p>
<i>Optional (Time permitting)</i>	AI tools for Ethics Applications	AI for ideation – formulate strategies to mitigate risk and/or respond to application questions using .pdf (National Statement on Ethical Conduct in Human Research)

CONTINUE EXPLORING AI TOOLS AFTER THE WORKSHOP AT BRONEAGER.COM

Recommended Tools

These tools are recommended for use in the training workshop.

There are many (!!) more available - see [Additional Resources](#) to explore further.

CHATBOTS / LARGE LANGUAGE MODELS

- [Bard](https://bard.google.com/): <https://bard.google.com/>
- [ChatGPT](https://openai.com/chatgpt): <https://openai.com/chatgpt>
- [Perplexity](https://www.perplexity.ai/): <https://www.perplexity.ai/>

ACADEMIC LITERATURE (SEARCH)

- Chatbots / Large Language Models
- [Elicit](https://elicit.org/): <https://elicit.org/>
- [Scite](https://scite.ai/): <https://scite.ai/> (Note. paid tool)

CHAT WITH PDF DOCUMENT(S)

- Chatbots / Large Language Models
- [PDF.ai](https://pdf.ai/): <https://pdf.ai/>
- [ChatPDF](https://www.chatpdf.com/): <https://www.chatpdf.com/>

(note. limited free trial)

- [Petal](https://www.petal.org/): <https://www.petal.org/>

Get 15% off subscription using

discount code: 'broneager'

TOOLS TO FIND MORE AI TOOLS :)

- [Future Tools](https://www.futuretools.io/): <https://www.futuretools.io/>
- [Supertools](https://supertools.therundown.ai/):
<https://supertools.therundown.ai/>

EVALUATE JOURNAL/ARTICLE 'QUALITY'

- [SJR](https://www.scimagojr.com/): <https://www.scimagojr.com/>
- [Google Scholar](https://scholar.google.com.au/): <https://scholar.google.com.au/>

REFERENCES (FORMAT/STYLE)

- [Scribbr](https://www.scribbr.com/citation/generator/): <https://www.scribbr.com/citation/generator/>

Mapping Your Path

Topic: Map out the functional steps in creating an academic publication/artefact.

Objectives:

- Identify the functional steps involved in creating an academic publication/artefact.
- Document and order the steps required to achieve the creation of an academic publication/artefact.

Intended benefit:

- Provides a way for participants to learn about the functional steps involved in creating an academic publication/artefact. These steps can later be mapped to the functional capabilities of AI tools.
- Helps participants to visualise academic workflows and enhance project planning.

Suggested Materials:

- Pens
- Paper
- Sticky notes

Pre-activity facilitation:

- Explain the goal of the activity: to map out the functional steps involved in creating an academic publication/artefact.
- Share examples of functional steps, such as ideating a topic/focus area, finding a unique contribution to make to a topic area, ideating research questions, conducting a literature review, finding relevant literature, synthesising the literature/journal articles, writing up summaries of key topics in the literature, etc.

Important:

Participants are *only* required to choose the *style of artefact* they wish to work on during the training day (e.g., a conceptual article, or a literature review) and *not* the topic (which will be explored in the next activity). HDR/PhD students should work on mapping the creation of a literature review.

Recommended group size: 2-3 participants.

See the next page for activity instructions.

Instructions	
1.	<p>Choose the Type of Academic Artifact (2 minutes):</p> <ul style="list-style-type: none"> • In groups, discuss and decide on the <i>type</i> of academic artefact you want to focus on for this activity (e.g., a literature review, a book chapter, or an academic journal article). HDR/PhD students should choose a literature review. • Write down your choice on a sticky note and place it at the top of your workspace. <p>Note. choose the <i>type</i> of artefact only, <i>not</i> the topic of the artefact.</p>
2.	<p>Brainstorming Activity – What are the Steps to Realising the Artefact? (10-15 minutes):</p> <ul style="list-style-type: none"> • In your group, brainstorm the steps involved in creating your chosen academic artefact. • Think broadly; no idea (i.e., step or task) is too small or too big. • Write down each idea/step on an individual sticky note.
3.	<p>Grouping and Sequencing Steps (5 minutes):</p> <ul style="list-style-type: none"> • As a group, review your brainstormed tasks/steps, grouping related tasks/steps together, and arranging them in a logical order (i.e., documenting the flow of the process to artefact creation). • This step may involve some discussion and negotiation among the group members.
4.	<p>Review and Reflect (3 minutes):</p> <ul style="list-style-type: none"> • Participants should review their roadmap, checking for completeness and flow. • As a group, discuss whether any steps are missing or if they could be rearranged for more efficiency. • By the end of this activity, each group should have a visual roadmap, created using sticky notes, detailing the functional steps involved in creating their chosen academic artifact.

If time allows, groups will be invited to briefly present their roadmap to the rest of the class, highlighting any unique or challenging steps they've included. This allow other groups to see different perspectives and potentially revise their own roadmaps.

AI for Ideation

Topic: Use AI tools (e.g., ChatGPT, Bard, or Perplexity) to explore research ideas.

Objectives:

- Discover how AI tools can be used to identify novel approaches to research topics.
- Use AI tools (chatbots) to identify unique contributions or perspectives to a research topic.
- Explore ways for how a research topic could be researched in novel ways.
 - Assign the chosen chatbot a persona, which will assist with the ideation process
 - Learn to write prompts to guide chatbot-generated outputs

Suggested AI tools (refer to [Recommended AI Tools](#))

- ChatGPT
- Bard
- Perplexity

Pre-activity facilitation:

- Explain the goal of the activity.
- If participants are unfamiliar with assigning personas to Chatbots, explain.
- Demonstrate an example, and introduce at least two of the AI tools recommended for this activity.

Additional notes.

- Participants are encouraged to ask for assistance throughout this activity to draw on the experience of the facilitator, as well as others in the room.
- Participants should aim to use multiple AI tools. This may be achieved by individual group members using different chatbots to generate and then compare outputs.
- At the completion of the activity, participants and groups will be invited to share their learnings, insights, and research topics.

See the next page for activity instructions.

Instructions	
1.	<p>Discuss and Decide on a Research Area of Interest (4-5 minutes):</p> <ul style="list-style-type: none"> • In groups, decide on a broad topic area to work on. Note. for the purposes of learning the AI tools, it is advised that a group choose a topic that holds wide appeal rather than any one group member's specific research area (e.g., the topic of one's PhD thesis). • Once a broad topic is agreed upon, write it on a sticky note and place it with the map created in the previous activity.
2.	<p>Decide which AI Model(s) to Use (1 minute):</p> <ul style="list-style-type: none"> • In your group, choose an AI chatbot to work with. If group members do not have access to a chatbot, please ask your facilitator for assistance. • It is recommended to use more than one chatbot for this activity so as to widen your exposure to AI models.
3.	<p>Write a Chatbot 'Persona' (5 minutes):</p> <ul style="list-style-type: none"> • As a group, discuss and craft an 'Act in the role of...' prompt to guide your chatbot's output (see Workbook 1A, AI for Educators activity). • Note. If you have not completed earlier training about personas, please ask your facilitator for assistance.
4.	<p>Explore and Refine Topic with Custom Prompts (30 minutes):</p> <ul style="list-style-type: none"> • Use the provided resource (linked below) for prompt writing examples, or write your own prompts to explore and identify: <ul style="list-style-type: none"> ◦ Novel approaches to investigating the topic ◦ Thesis statements ◦ A working title for your paper/literature review/etc. ◦ Draft research questions to guide a literature search <p><u>RESOURCE: View an abridged (read-only) version of 'AI Prompts for Academic Research'</u> The resources includes example prompt/suggestions to guide AI models to assist in developing unique approaches for investigating your topic.</p>

If time allows, the class is invited to share their research topic, and questions, and reflect on the process of ideating with AI.

AI-Powered Literature Search

Topic: Use AI tools to locate academic literature.

Objectives:

- Explore AI tools to assist with literature searches.
- Gain awareness of semantic search functionality.
- Critically evaluate the quality of literature.

Suggested AI tools (refer to [Recommended AI Tools](#))

- **For locating academic literature:**
 - [Elicit](#)
 - [Perplexity](#)
 - [+ Chatbots](#) (noting limitations / 'hallucinations!')
- **For evaluating journal 'quality' and 'citations'**
 - Journal rankings: [SJR / Scimagojr](#)
 - Citations: [Google Scholar](#)

Pre-activity facilitation:

- Explain the goal of the activity.
- Demonstrate 1-2 tools, explain tool functionality and semantic search.
- *For HDR/PhD training sessions:* explain quality evaluation techniques.

By the end of this activity, each group will have explored 1-2 AI tools for finding academic literature/research papers, located 4-5 papers, evaluated their quality, and downloaded .pdf versions of each paper for use in the next activity.

After the workshop:

- Participants are encouraged to learn more about AI tools for literature search by exploring the YouTube channels suggested in [Additional Resources](#).

ACTIVITY: AI SEARCH - BUILDING YOUR LITERATURE LIBRARY

Instructions	
1.	Select AI Tools (2 minutes): <ul style="list-style-type: none">• In groups, discuss which AI tools (1-2) you wish to explore.
2.	Account Creation and Tool Exploration (5 minutes): <ul style="list-style-type: none">• Create a free account/tool signup. Note, a non-university email account is recommended (e.g., Gmail) due to potential delays in receiving signup confirmation.• Once logged in, explore the functionalities of the tools and familiarise yourself with the interface.
3.	Locating Academic Literature (20 minutes): <ul style="list-style-type: none">• Use the AI tool to find academic literature relevant to a predefined topic.<ul style="list-style-type: none">◦ Note. group members may choose to use multiple AI tools on separate laptops and compare/discuss results. <p>Locate 4-5 academic papers related to your group's earlier identified topics/research questions.</p>
4.	Evaluating Paper Quality (10 minutes): <ul style="list-style-type: none">• Use Scimagojr and/or Google Scholar to evaluate quality of identified literature. Evaluate using factors like the journal ranking, citation counts, and the reputation of the authors and institutions. For each paper:<ul style="list-style-type: none">◦ Check journal ranking using Scimagojr◦ Check citation count using Google Scholar◦ (Or use the AI tools in-built quality evaluators)• If identified papers do not meet quality standards, use AI tools to locate additional literature.
5.	Downloading Papers (5-10 minutes): <ul style="list-style-type: none">• Download .pdf copies of the identified papers. For the purpose of this learning activity, aim to download 4-5 papers.
6.	Class Reflection and Discussion <ul style="list-style-type: none">• Come back together as a class for reflection and discussion.

Literature Summary Matrix

Optional Activity.

*Note. This task may be achieved using an AI tool such as Petal.org
Petal is a paid tool. Get 15% off using discount code 'broneager'.*

Objectives:

- Generate a spreadsheet containing literature/topic summaries.
- Use the spreadsheet to simulate multi-document analysis for thematic summaries.

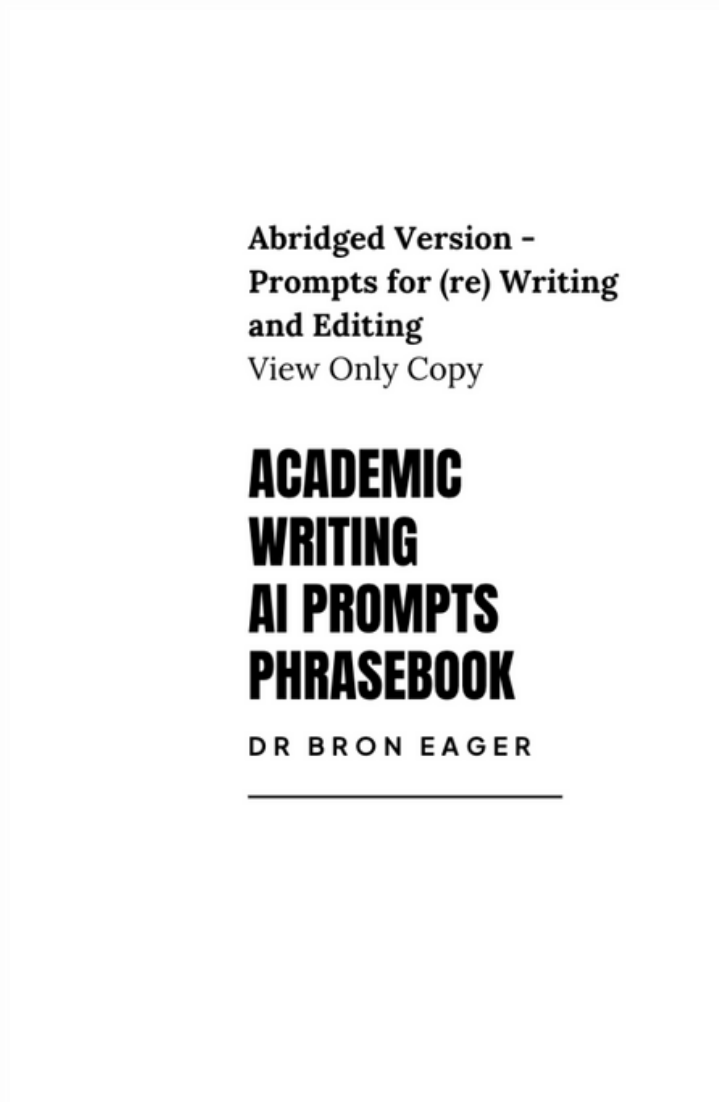
Instructions:

1. Replicate the table layout below in Excel, Google Sheets, or equivalent.
2. Craft prompts (e.g., Prompt 1, Prompt 2) to 'ask' an uploaded .pdf (journal article/paper) a question relating to your research (e.g., your research questions)
3. Upload .pdf to your preferred AI tool, and run each prompt, cutting and pasting the generated output into the corresponding cell in the spreadsheet.
4. Use the same prompts to generate outputs across each paper (Paper A, B, C etc.)

Paper	Prompt 1 (e.g., Research Question 1)	Prompt 1 (e.g., Research Question 2)	Prompt 1 (e.g., Research Question 2)
Paper A	[Insert AI generated output summary]	[Insert AI generated output summary]	[Insert AI generated output summary]
Paper B	[Insert AI generated output summary]	[Insert AI generated output summary]	[Insert AI generated output summary]
Paper C	[Insert AI generated output summary]	[Insert AI generated output summary]	[Insert AI generated output summary]
Paper D	[Insert AI generated output summary]	[Insert AI generated output summary]	[Insert AI generated output summary]
Paper E	[Insert AI generated output summary]	[Insert AI generated output summary]	[Insert AI generated output summary]

Additional Resources: Example Prompts for (Re) Writing and Editing

Example prompts for use with Chatbots (LLMs) can be accessed [here](#), or by clicking on the image below.



Additional Resources: Recommended YouTube Channels

RESEARCH-FOCUSED / ACADEMIC

- Dr Andrew Stapleton:
<https://www.youtube.com/@DrAndyStapleton>
- Science Grad School Coach:
<https://www.youtube.com/@SciGradCoach>
- Dr Lyndon Walker:
<https://www.youtube.com/@DrLyndonWalker>

GENERAL AI TOOLS AND NEWS UPDATES

- Matt Wolfe: <https://www.youtube.com/@mreflow>
Note. Also has a fantastic email newsletter!



Dr Bron Eager

Globally recognised for achieving impact through AI and digital skills training for the higher education community.

- Provided training to 1000+ academic researchers and educators from 50+ Universities around the world.
- Invited speaker and presenter at the Quality Assurance Agency for Higher Education (QAA) events.
- Creator of educational resources for enhancing AI literacy, adopted globally by Universities as recommended training materials for upskilling staff to navigate the new world of AI-embedded academic work.
- Author of 'Academic Writing AI Prompts Phrasebook'.
- Awarded University Innovation Medal for digital pedagogy initiatives at her home institution, the University of Tasmania.
- Senior Lecturer in the College of Business and Economics, University of Tasmania, Australia.
- Scholarly Practitioner, with multi-disciplinary research interests spanning digital skills development, entrepreneurship, gender studies, and the scholarship of teaching and learning.
- Excellence in teaching, focusing on applied practice-based pedagogy.
- PhD (mixed-methods, business and psychology).
- Master of Entrepreneurship & Innovation (MEI).
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- Certificate IV Training and Assessment.



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