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AUSTRALIA

## HDR HELPFUL HINTS

From the Dean of Graduate Research, Simon Moss.

# Uses of AI in research – writing and drafting





## SUMMARY AND CAUTIONS

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Perhaps the most common use of generative AI in research revolves around writing. That is, many researchers use generative AI tools, such as Chat GPT or Claude, to draft papers and to optimise their writing. For example, people may use generative AI tools to

- learn how to write more precisely, concisely, and professionally,
- identify and correct errors or shortcomings in their writing,
- arrange their arguments cohesively,
- check the quality and integrity of their work—such as assess plagiarism or to evaluate whether a paper fulfills the criteria of a journal.

Despite the utility of generative AI, some of the cautions that apply to AI in general are especially pertinent to writing. The following table outlines how these cautions relate to writing.

CAUTION		RELEVANCE TO WRITING
	1 Private information	<ul style="list-style-type: none"> <li>Do not upload sections of papers that may be later included in a patent.</li> <li>Do not upload copyrighted articles—such as prompt an AI tool to summarise an article that is available at the UOW library but is not available to the public.</li> </ul>
	2 Plagiarised answers	<ul style="list-style-type: none"> <li>Do not copy and paste the output of an AI tool and represent this output as your own work.</li> </ul>
	3 Verify answers	<ul style="list-style-type: none"> <li>Seek advice from other individuals, such as your supervisors or Student Success, on your writing rather than depend solely on AI.</li> <li>Note the writing that AI generates is typically better than an average writer but not as professional or engaging as exemplary writers (No &amp; Zhang, 2023).</li> </ul>
	4 Acknowledge use	<ul style="list-style-type: none"> <li>Acknowledge all use of AI in the acknowledgements section.</li> <li>If you publish, acknowledge all use of AI in the cover letter.</li> </ul>

## Plagiarised answers

Typically, to avoid plagiarism, you should not insert the output of an AI tool into your drafts and then represent this output your own work. You should be aware of some exceptions, however, in which you can insert the output into your publications or thesis. The following table illustrates these exceptions.

EXCEPTION	EXAMPLE	RATONALE
Use of AI to condense sentences or paragraphs.	“Here is a section I have written: ... Can you rewrite this section—but only by deleting unnecessary words or phrases so the work is more concise?”	The researcher generated all the words. The AI tool merely deleted some words, phrases, or sentences that were unnecessary.
Use of AI to improve some words or phrases.	“Here is a section I have written: ... Can you rewrite this section—but only by replacing some words or phrases with more appropriate words or phrases?”	The researcher generated most of the words. Only a few words or phrases had been replaced.  If candidates had derived these words or phrases from reading a book, they would not cite this

		<p>book—because these words and phrases are used widely. Therefore, failure to acknowledge the AI tool would not be regarded as plagiarism.</p>
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## DEVELOP YOUR WRITING SKILLS

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One of the most helpful uses of generative AI to HDR candidates revolves around writing skills. That is, many candidates use generative AI to improve their writing capabilities. Indeed, as Nguyen et al. (2024) revealed, if HDR candidates interact with generative AI tools to iteratively enhance their research, their writing skills tend to improve significantly. The following table presents some examples to illustrate these benefits of generative AI.

<b>PRACTICE</b>	<b>EXAMPLES</b>
<ul style="list-style-type: none"> <li>Prompt AI tools, such as Chat GPT or Claude, to help you identify shortcomings in your writing and suggestions on how to overcome these shortcomings.</li> </ul>	<ul style="list-style-type: none"> <li>First, upload a paragraph you have written in your literature review.</li> <li>Enter a prompt like “Can you offer suggestions on how I can improve my writing—such as words or phrases that I use incorrectly or other principles I should consider?”</li> <li>What are some principles I should consider to improve my writing? Can you illustrate these principles with reference to my paragraphs?</li> </ul>
<ul style="list-style-type: none"> <li>Rather than merely ask the tool to help you improve your writing, specify more explicit criteria. For example, you could prompt the tool to help you write more precisely, concisely, and professionally.</li> </ul>	<ul style="list-style-type: none"> <li>In my research paper, I want to write “A lot of studies have looked at whether exercise really does help people with avoiding diabetes”. Which words could be more precise?</li> <li>In my research paper, I want to write “A lot of studies have looked at whether exercise really does help people with avoiding</li> </ul>

	<p>diabetes”. Which words could be deleted or which phrases could be reduced?</p>
<ul style="list-style-type: none"> <li>• Ask generative AI to help you arrange your arguments in a logical order.</li> </ul>	<ul style="list-style-type: none"> <li>• I want to describe evolutionary theory. What are the main propositions or assumptions of this theory? In what order should I present these propositions or assumptions?</li> </ul>
<ul style="list-style-type: none"> <li>• Ask generative AI to help you identify more suitable terms or words that may be useful in your discipline</li> </ul>	<ul style="list-style-type: none"> <li>• In my research paper, I want to write about how I gave participants a survey. What is a better word or phrase to describe this activity?</li> <li>• Here is an excerpt of my writing. What are some helpful words that I have overlooked?</li> <li>• What are some verbs or adjectives that are often used in science papers in my field but seldom used in other literature?</li> </ul>
<ul style="list-style-type: none"> <li>• Ask generative AI to examine your articles, chapters, or theses from the perspective of an examiner.</li> <li>• Utilise this option only if the generative AI tool is secure—so your work remains private.</li> </ul>	<ul style="list-style-type: none"> <li>• Here is a paper I plan to submit to a journal. Can you assume the role of a reviewer and review the paper? That is, can you identify potential shortcomings of this paper?</li> </ul> <p>This prompt is more effective if you also specify the criteria the tool should use to evaluate your paper and to suggest improvements. For example, you could write:</p> <ul style="list-style-type: none"> <li>• When you evaluate this paper, can you consider the following attributes or criteria?</li> <li>• First, assess whether the information I presented is accurate and recent.</li> <li>• Second, assess whether I have supported each of my arguments with evidence.</li> <li>• Third, assess whether I have clarified and justified all my methodologies and methods.</li> </ul>

	<ul style="list-style-type: none"> <li>• Fourth, assess whether the arguments are organised coherently.</li> <li>• Fifth, assess whether the language is precise, concise, professional, grammatical, and appropriate to an academic audience.</li> <li>• For each of these criteria, can you provide advice on how I can improve the paper?</li> </ul>
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## SPECIALISED WRITING TOOLS

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Although many generic AI tools, such as Chat GPT, can help you develop your writing skills, you may be more likely to benefit from tools that specialise in writing. The following table outlines some of these tools. For example, these tools may

- offer advice that is more customised to academia,
- offer more recommendations on how to improve your sentences,
- offers advice on more attributes, such as advice on how to rearrange the order of your arguments effectively,
- help you adapt your style to accommodate different audiences,
- check plagiarism,

TOOL	DETAILS
DeepL Write	<ul style="list-style-type: none"> <li>• Offers many suggestions on how to improve your writing.</li> <li>• Can adapt the opinions to different styles, such as business, academic, or casual.</li> </ul>
Grammarly	<ul style="list-style-type: none"> <li>• One of the most common AI tools to enhance writing.</li> </ul>
Heminway AI	<ul style="list-style-type: none"> <li>• Helps researchers write more boldly, concisely, and simply.</li> <li>• For example, the app identifies unnecessarily complicated sentences, unhelpful words, passive voice, or common errors.</li> <li>• So, in contrast to other tools, uncovers subtler concerns.</li> </ul>
<u>Paperpal</u>	<ul style="list-style-type: none"> <li>• Customised to assist the writing of academics and researchers.</li> <li>• That is, the tool suggests changes that are compatible with the organisation and expectations of academic papers.</li> <li>• The free version offers many features, such as suggesting better words and extending your vocabulary.</li> </ul>

	<ul style="list-style-type: none"> <li>• For example, the tool not only improves the clarity of sentences but also rearranges sentences and paragraphs to improve the cohesive flow.</li> <li>• Paperpal can also check plagiarism.</li> </ul>
<u>Quillbot</u>	<ul style="list-style-type: none"> <li>• Can help you detect errors, identify suitable words, and adapt the style of your writing to suit the audience.</li> <li>• If you pay, you can also use additional features—such as the capacity to rephrase extracts of unlimited size</li> </ul>
smodin.io	<ul style="list-style-type: none"> <li>• A suite of tools, designed to support researchers and improve the writing of papers and theses.</li> <li>• For example, you can ask the tool to generate a set of paragraphs with specific properties on a specific topic. You merely enter some keywords or an abstract. The tool will then generate useful paragraphs with accurate references.</li> </ul>
<u>WordTune</u>	<ul style="list-style-type: none"> <li>• rewrites your work or summarises long documents or even YouTube videos.</li> <li>• presents many suggestions on how to improve your writing while enabling you to maintain your independence and style.</li> <li>• A free version is available but limited in the number of rewrites or summaries the tool can perform. The unlimited version is about US \$10 a month, as of July 2024.</li> </ul>
Writefull	<ul style="list-style-type: none"> <li>• Customised to assist the writing of academics and researchers.</li> <li>• The tool presents many suggestions on how to craft your sentences better.</li> </ul>

Although useful, many AI chatbots, such as Chat GPT and Claude, offer similar capabilities. Of these chatbots, many users feel that Claude offers the best recommendations around writing.