UNIVERSITY OF CALGARY
Student Success Centre

Why Using Gen AI Requires Critical Thinking

Generative Artificial Intelligence (Gen AI) introduces new opportunities to support education and research, but we still need to approach Gen AI with careful thought and consideration. While AI's speed and efficiency sound promising, it also comes with risks. This handout provides important considerations when using AI.

Intellectual Considerations

Cognitive Offloading

Relying on AI to think, to remember, and to solve problems for you can have impacts on your intellectual development. While using AI in these ways can feel more efficient, it also reduces your ability to think critically and retain information.

A 2011 study found that, while search engines made information more accessible, this very accessibility impacted memory retention (Sparrow et al.). More recent studies suggest that AI's promise of availability and efficiency may diminish independent problem-solving, reflective thinking, and critical engagement (Gerlich, 2025). And while AI tools often provide short-term benefits, these outcomes are not sustained when the tool is removed (Ceciliio-Fernandes & Sandars, 2025).

Human judgment and independent critical thinking remain essential in education and everyday decision-making. When used properly, AI tools have potential to make the learning process more interactive and strengthen cognitive engagement. However, AI tools shouldn't be used to replace human thinking in cognitive tasks.

Your role: Use AI to extend—not replace—your cognitive effort.

Sycophancy

AI tools are often designed to be helpful and agreeable. As a result, they may mirror your assumptions instead of questioning or correcting them. This is called sycophancy—when AI confirms what you say, even if it is misleading, biased, or incorrect.

For example, if you ask AI to support an argument, it will usually provide reasons to agree with you rather than challenge your claim, even when the claim is weak. This can give a false sense of accuracy and discourage deeper questioning.

Over time, relying on AI's sycophantic responses can reinforce biases, narrow your perspective, and weaken your critical thinking. Encouraging disagreement and critique helps you keep your learning active and reflective.

Your role: Treat AI as a sparring partner, not a cheerleader. Prompt it to critique, question, or provide counterarguments for your ideas. Even when you use AI to assist with idea generation, ask yourself: "What might be wrong with this idea?" or "What perspectives might I be missing?"

Gen AI gets a lot of things wrong

Gen AI can do a very good job at sounding convincing. It is able to create responses that seem factual, but its lack of ability to fact-check leads to a phenomenon known as "AI hallucination," where the tool presents incorrect or misleading information as fact, due to factors such as insufficiencies in training data, biases in the data set, and incorrect predictions from the AI's predictive model.

In some instances, AI tools can even invent references, citing real scholars and researchers. It is our responsibility to check these references and verify what is true and what is a hallucination.

Your role: Always verify claims, cross-check sources, and never assume AI outputs are correct until you have confirmed it.

Ethical Considerations

When using Gen AI, there are several ethical considerations you must take into account. These include:

Gen AI tools make it easier to spread misinformation

While Gen AI often gets things wrong, it can also be prompted by users to create fabricated media to disseminate false news and push certain agendas (Shin, 2024). These fabrications can often be difficult to distinguish from real facts. More than ever, we need to approach the information we consume with healthy skepticism. Critical thinking, fact-checking, and media literacy are vital skills when navigating today's information landscape.

Your role: Practice good digital and media literacy by verifying information online. Remember, online content—especially AI-generated content—can have exaggerated claims and inaccurate citations.

Plagiarism

Gen AI uses predictive modeling to generate text, images, audio, or videos. This means that Gen AI tools effectively regurgitate writing, sounds, photos, and artwork included in its training data without attributing the original creators. Even when Gen AI includes citations in its output, you cannot guarantee that it has cited all source material ethically and accurately.

Your role: Never submit AI-generated material as your own work. Before using AI in coursework, always confirm if and how AI use is permitted for your course and assignment. Also, it is important to disclose how you have used AI tools in your work. Disclosure may look different depending on your instructor's expectations and the citation style you are using, so make sure your citations align with the appropriate guidelines.

Intellectual Property

Gen AI tools often use your prompts and responses to further train their algorithms. We need to be aware that when we enter prompts and data into the AI tool, we often grant the system broad rights to use that input. By entering information into an AI tool, users may be relinquishing ownership over their own intellectual property without realizing it.

This may be especially problematic when submitting content owned by someone else (e.g., exam questions, books, study materials, etc.) into an AI tool. If this content is used to generate outputs or becomes part of the model's training data, it could result in unauthorized reproduction or misuse of copyrighted material.

Additionally, it is important to consider that the data used to train the AI model might have been used without permission. When you use AI's outputs in your work, you may be including others' intellectual property or copyrighted material without their permission.

Your role: You can use AI to help you think (e.g., brainstorm ideas or draft outlines), but you must make sure your final work reflects your own thinking and originality. You should also make sure that your final work contains citations from verified sources to properly credit others.

Privacy Considerations

AI systems can retain information to learn from the data provided by its users. However, anyone with a UCalgary IT account has access to a secure version of Microsoft Copilot Chat to better protect user data.

Your role: Protect your data and the data of others by avoiding sensitive inputs. Even when using a secure version of an AI tool, you should not input personal or confidential information.

Bias

AI systems are trained on large datasets that are a product of human history, culture, and behaviour. Because humans have created these data sets, these data sets will contain systemic bias. When gen AI tools are trained on data sets, they can reproduce and reinforce the systemic bias present in the training data. Moreover, AI's predictive modeling tends to amplify these biases. One effect of this is that interacting with biased AI can inadvertently increase our own biases, especially when we remain unaware of the AI's biased algorithm (Glickman & Sharot, 2025).

Your role: Question whether outputs privilege some perspectives while overlooking others. Consider asking AI to identify possible counterarguments or missing viewpoints, then critically evaluate those suggestions.

Academic Integrity

Many AI tools can assist with research, studying, proofreading, and even writing. However, using AI can often blur the line between assistance and academic misconduct, especially if an AI tool is used without explicit instructor permission and proper attribution. Overreliance on AI can also undermine the learning process and devalue genuine academic effort.

Your role: Clarify expectations with your instructor and always cite AI use.

It is your responsibility to ensure that your instructor permits you to use AI in your learning. Each course may adopt different rules regarding AI usage depending on learning outcomes. Note that not all instructors will allow AI use in their courses. Don't hesitate to talk to your instructor about AI use in class, especially if their expectations are unclear.

Transparency

If you decide to use AI in your studies, one of your key responsibilities as an ethical user of gen AI tools is to be transparent. In any assessment, you should disclose where, when, and how you used AI and include proper attribution.

Some students may be uncomfortable when talking about AI, while others may more openly discuss AI use. However, it's important to have healthy conversations about these emerging technologies so that we can better develop new ethical practices.

Accountability

You are responsible for the ways you use AI and its outputs. When AI systems make mistakes (they often do), you remain responsible for verifying information, correcting inaccuracies, and eliminating harmful biases. You are also responsible for respecting institutional policies and your instructor's expectations.

Environmental Impact

AI systems can directly and indirectly cause environmental harm. Data centres consume a lot of energy, resulting in significant carbon emissions, and produce a lot of electronic waste (United Nations Environment Programme, 2024). Additionally, many AI systems use water cooling to support their servers, consuming large amounts of water during training and with each query (Li et al., 2023).

Certain communities and regions are more vulnerable to AI's environmental harms, exacerbating environmental inequity (Ren & Wierman, 2024). Responsible AI use must include weighing its benefits against its impacts on the planet.

Use AI tools responsibly and productively

When using AI, it is important to reflect on how you use it.

- **Self-reflection:** Are you replacing or extending your own thinking? When using AI to support your learning, are you more or less engaged with the material?

- **Collaborative use:** When working in groups, agree on how AI will be used and what should remain strictly human work.

- **Equity considerations:** Not everyone has equal access to secure or advanced AI tools. Respect these differences when collaborating.

- **Future mindset:** AI literacy is not static. Treat it as a lifelong skill that evolves with new technologies.

Tips for responsible AI use

Here are a few more tips to leverage AI tools to help support your learning and reinforce your critical thinking:

- Try asking AI to summarize a text you've already read, then compare its version with your notes. This way, you strengthen your own understanding while potentially catching AI's errors or your own.

- Ask AI for counterarguments, knowledge gaps, and diverse perspectives, and then evaluate these perspectives on your own.

- Ask AI to generate practice questions, then attempt them without AI support.

Conclusion

Responsible use of AI tools means being aware of the implications. In addition to ethical considerations, you should think about how AI may affect your academic or professional development. To support your personal growth, try to engage with AI tools critically rather than simply delegating cognitive tasks to a robot assistant. For more information on University of Calgary's AI policies and resources, check out the [AI at UCalgary page](#).

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