Supporting Resources for the Use of Generative Artificial Intelligence in Teaching and Learning

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Introduction

In April 2025, the NOSM University (NOSM U) Senate approved the first edition of its Guidelines for the Use of Generative Artificial Intelligence in Teaching and Learning.

The present *Supporting Resources* are meant to complement these guidelines by providing additional implementation and operationalization guidance. References to external *Supporting Resources*, such as guidance provided by external bodies and training opportunities, will be made available to the NOSM U community to complement these guidelines. We invite you to consult these resources for a better understanding of the latest advancements in the sector, and to access practical tools that can support your implementation of these guidelines.

Prompt Engineering

GenAl abides by the principle "garbage in, garbage out", which means that the quality of its output depends directly on the quality of the input data. With respect to GenAl, the input encompasses not only the data that the Al model is trained on, but also the prompts and the set of instructions that are given to the GenAl tool.

Prompt engineering refers to "the processes and techniques for composing input to produce GenAI output that more closely resembles the user's desired intent." (UNESCO, 2023)

The UNESCO's Guidance for Generative AI in Education and Research (2023) states that:

"Prompt-engineering is most successful when the prompt articulates a coherent chain of reasoning centred on a particular problem or a chain of thought in a logical order. Specific recommendations include:

- Use simple, clear and straightforward language that can be easily understood, avoiding complex or ambiguous wording.
- Include examples to illustrate the desired response or format of generated completions.
- Include context, which is crucial for generating relevant and meaningful completions.
- Refine and iterate as necessary, experimenting with different variations.
- Be ethical, avoiding prompts that may generate inappropriate, biased or harmful content."

The following resources can support you in developing your prompt engineering skills:

- Introduction to Artificial Intelligence: Prompt Generation, by the University of Warwick Library
- What Is Prompt Engineering? Definition and Examples, by Coursera
- <u>Prompt Engineering for Image Research</u>, by the University of Toronto
- Free MOOC on Prompt Engineering for ChatGPT, by Vanderbilt University (on Coursera)

Data Security

As outlined in NOSM U's *Guidelines for the use of Generative AI in Teaching in Learning*, a main concern with respect to the use of GenAI tools is ensuring adequate data security.

Although certain GenAl tools, notably when using paid licenses, provide an option to opt-out of any data inputted into the tool to be used to train the Al model, we invite the members of the NOSM U community to adopt a precautionary approach when determining what information to input in GenAl tools.

For instance, a recent report of a Data Protection Impact Assessment on the use of Microsoft 365 Copilot for Education advises education organizations **not** to use Microsoft 365 Copilot, since it lacks adequate measures to mitigate data protection risks. Although Microsoft claims that its models are not trained using organizational data, some risks might remain. (You can consult this report <u>here</u>.)

Members of the NOSM U community are responsible for ensuring that their use of data is consistent with existing laws and policies, notably but not limited to Ontario's <u>Personal Health Information</u> <u>Protection Act</u>.

For more information, members of the NOSM U community should consult the institution's Handling Sensitive Electronic Information Policy and its Appendix A on Data Classification (see below), as well as the Acceptable Use of Information Technology Policy.

Handling Sensitive Electronic Information Policy: Appendix A – Data Classification

SENSITIVE INFORMATION

Data, information, or intellectual property in which NOSM U has a legal interest or ownership right and is intended for only limited dissemination.

Examples may include, but are not limited to;

- Draft planning documents;
- Internal websites;
- Official meeting minutes before approved;
- Unreleased public announcements, and;
- Procurement process documents (pre-award).

HIGHLY SENSITIVE INFORMATION

Data, information, or intellectual property in which NOSM U has a legal interest or ownership right, and which, if compromised, could cause significant harm to the University.

Examples may include, but are not limited to;

- Research data
- Personally identifiable information
- Financial information and contracts
- Trade secrets and patent applications
- Account passwords or encryption keys used to protect access to NOSM U data, and
- Data from a third party when NOSM U has agreed to keep such material confidential.

PERSONALLY IDENTIFIABLE INFORMATION

Information relating to an individual that reasonably identifies the individual. Personally identifiable information is further defined by both federal and provincial legislation.

Examples may include, but are not limited to;

- The individual's name if it appears with other private information relating to the individual or where disclosure of the name would reveal other private information about the individual
- Any identifying number, symbol or other assigned to the individual
- The address, telephone number, email address(es), personal electronic identity(ies), or biometric identifiers of the individual
- Information relating to the race, national or ethnic origin, religion, age, sex, sexual orientation, gender identity, or marital or family status of the individual
- Information relating to the education or the medical, psychiatric, psychological, criminal or employment history of the individual
- Information relating to financial transactions in which the individual has been involved
- Student grades or disciplinary information
- Salary or employee performance information, and
- Correspondence sent to an institution by the individual that is implicitly or explicitly of a private or confidential nature and replies to that correspondence that would reveal the contents of the original correspondence.

Classification	Data Classification Description	
High Risk		Data that is highly sensitive and the level of protection is dictated externally by legal and/or contractual requirements.

Definition Examples:	
Official Government ID (e.g. Passpo	rt ID,
Driver's License No.),	
• Bank account details,	
Payment Card Industry (PCI) Inform	ation,
which must be protected under the Payn	nent Card
Industry – Data Security Standard (PCI-D	SS)
Personal Health Information (PHI),	
Personal Information protected und	er the
Freedom of Information and Protection of	or Privacy
Act (FIPPA) (e.g. Date of Birth (DOB), Soc	cial
Insurance Number (SIN), name, address)	
Learner grades or disciplinary inform	nation
Employee performance information	
NOSM U ID	
Principle High risk data may only be shared with author	ized
parties with a specific business need	
SIGNIFICANT DAMAGE would occur if i data were to become available to unauth	nigh risk orized
parties either internal or external to NOS	M U.
Potential Impact of Loss Impact could include violating regulatory	or
contractual requirements, damaging the	orations
or financial loss, such as regulatory fines	or
damages from litigation.	
Data that is not protected by law or industry r	egulation
from unauthorized access, use or destruction,	but could
Cause narm to NOSM U or others if released t	0
Framples:	
Proprietary information received fr	m a third
party under a non-disclosure agreement	in a tina
Restricted circulation library journal	s
Confidential financial information a	- nd
records	
Medium Risk	odv to
harm the security of individuals, systems	or
facilities	
Research information of a non-pers	onal,
proprietary nature	
Trade secrets and patent application	าร
Principle Medium risk data may only be shared with aut	horized
parties with a specific business need	
• <u>MODERATE DAMAGE</u> would occur if Mediu	ım Risk
data were to become available to unauthorize	d parties
Potential impact of Loss either Internal or external to NOSM U.	vrity of
publication. loss of access to journals and othe	er
copyrighted materials	
Data that has been approved for release to th	e public
Low Risk and is freely shareable both internally and extra	
	ernally.
Definition Examples:	ernally.
Definition Examples:	ernally.

	• Information that is posted on our public website
	 Research information of a non-personal, non- proprietary nature
Principle	Data can be shared with all parties, with or without a specific business need
Potential Impact of Loss	 MINIMAL or NO DAMAGE would occur if Low Risk data were to become available to unauthorized parties either internal or external to NOSM U. Impact could include damaging the company's reputation, minor embarrassment or minor operational disruptions.

Environmental Impacts

The development, training, deployment and use of GenAl models come at a significant environmental cost, including increased electricity demand and water consumption.

In alignment with NOSM U's commitment to planetary health, we strongly encourage members of our community to consider environmental responsibility an integral component of ethical use of GenAl tools.

Emily Simpson, an Instructional Associate at the Centre for Teaching, Learning and Research at the Vancouver Community College, shared a series of guiding questions to help individuals determine if and how they want to use AI tools to mitigate their environmental footprint during a presentation for BCcampus in February 2025 (<u>Climate Conscious AI Use – Wrestling with Environmental Impacts</u>). We invite you to read these guiding questions to inspire your own reflections regarding ethical and environmentally conscious AI use.

- Purpose: Why am I using AI?
 - Is this necessary or for fun?
 - Is speed critical?
 - Am I trying to create/do something I couldn't do on my own?
 - Has someone already done this?
 - Is this the right tool for the task?
 - Is this aligned with my pedagogy/ethics?
- Reusability: What is the reusability of what I'm creating with AI?
 - Is this for a one-time use, or multi-use? Will the generated content be re-used?
 - Am I saving/storing generated content?
 - Am I labelling AI-generated materials?
- Impact: Who will gain through my use of AI? What are the costs? Who bears them?
 - Who benefits the most?
 - Who is bearing the cost?
 - Is a company benefitting of the data I input for training? Am I giving up intellectual property rights?
 - Is this use worth the environmental impacts that it will cost? Who risks being impacted by the environmental cost of my use of AI?
 - \circ $\:$ If I had to pay for each prompt I unput, would I use it as much as I currently am?

Matthijs Ten Tije also shared <u>5 Practical API Techniques to Lower Your AI Environmental Footprint</u> in 2024, that we encourage you to take into consideration in your decision-making regarding AI use:

1. Reflect on the necessity of AI usage: Evaluate whether using AI is essential for each task. If simpler alternatives like web searches, textbooks, or discussions with peers suffice, opt for those options to reduce unnecessary energy consumption.

- 2. Use appropriate AI models: Choose models that are best suited for your specific needs. For example, use smaller, less resource-intensive models like GPT-3.5 for simpler queries, and reserve advanced models like GPT-4 for complex tasks that truly require their capabilities.
- 3. Reuse and recycle AI responses: Store and reuse AI-generated responses whenever possible, especially for repetitive questions. This reduces the number of API calls and lowers the associated energy consumption.
- 4. Limit output length: Control the length of AI-generated responses by setting token limits. Shorter responses require less computational power, thus reducing both energy usage and response time.
- 5. Batch your prompts: Combine multiple questions or tasks into a single request to minimize the number of API calls. This not only reduces computational resources and energy consumption but also saves time and money.

You can find more information about the environmental cost of GenAl and large language models below:

- Explained: Generative Al's Environmental Impact (Zewe, A., January 2025)
- <u>Al's Impact on the Environment, Explained</u> (Deng, G., January 2025)
- <u>Making AI Less "Thirsty": Uncovering and Addressing the Secret Water Consumption of AI Models</u> (Li, P., Yang, J., Islam. M. A. and Ren, S., March 2025)
- From Efficiency Gains to Rebound Effects: The Problem of Jevon's Paradox in Al's Polarized Environmental Debate (Luccioni, A. S., Strubell, E. and Crawford, K., January 2025)
- <u>The Climate and Sustainability Implications of Generative AI</u> (Bashir, N., Donti, P. Cuff, J. et al., March 2024)
- Environmental Impact of Generative AI 20+ Stats and Facts (Dhanani, R., September 2024)
- <u>The Uneven Distribution of Al's Environmental Impact</u> (Ren, S. and Wierman, A., July 2024)
- <u>Carbon Emissions and Large Neural Network Training</u> (Patterson, D., Gonzalez, J., Le, Q., et al., April 2021)

Syllabus Statements (Templates)

Sample statements are provided below to support faculty responsible for a course in determining if and how the use of GenAl tools is allowed within their course and communicating their decision with their students. It is strongly advised to include such statements in each assessment's instructions.

Scenario	Sample statement
If the use of GenAl is allowed at any stage of the assignment, the following statement can be used	The use of GenAl tools to complete this assignment is allowed but shall be properly cited following the guidance detailed in <i>Acknowledging Use</i> of GenAl.
If the use of GenAl is required at any stage of the assignment	Since the purpose of this assignment is to support your learning of benefits and limitations of using GenAI tools, the use of GenAI tools is required for this assignment.
	Any use of GenAl tools must be properly cited following the guidance detailed in <i>Acknowledging Use of GenAl</i> .
	Note for faculty: Not all learners might have access to GenAl tools of comparable quality. A significant number of higher-quality models are only available at a cost. Hence, it is discouraged to assess the quality of the output. Rather, learners should be assessed on abilities such as the process completed (e.g., prompt engineering) or their capacity to critically evaluate the outputs generated.

If the use of GenAl is allowed at certain stages of the assignment only, the following statement can be used All pieces of work submitted should be your own work. However, reasonable use of GenAl tools is tolerated solely in the following contexts *(Note for faculty: check only those that apply):*

□ Note-taking;

Generating ideas and brainstorming (e.g., identifying strategies to solve a given problem, relevant articles about a certain topic, etc.);

Structuring ideas (e.g., creating an outline for an essay or a course);

Summarizing key points (e.g., summarizing readings, PPTs, data sets, etc.);

Transforming input into different formats (e.g., text into infographics, articles into a podcast, etc.);

Generating codes or identifying problems within a code;

□ Transforming data sets;

Proof-checking statistical analysis of data sets;

Generating content, either text, audio, photo or video (e.g. generating emails, essays, speeches, cover letters, course material, etc.);

Proofreading (e.g. identifying and correcting mistakes);

Rewriting (e.g., improving grammar, changing tone, cutting down wordcount, etc.);

Translating existing work (e.g., course material, published articles, online content, etc.) to one's preferred language;

Translating one's own work into the required submission language;

Providing formative feedback (e.g., asking for feedback on a draft);

Providing summative feedback (e.g., grading assignments);

☐ Tutor or study buddy (e.g., answering questions about concepts, generating cue cards or formative quizzes, creating case studies or simulations, etc.);

Other: _____

Any use of GenAI tools must be properly cited following the guidance detailed in *Acknowledging Use of GenAI*.

Any use outside of the above will be considered academic misconduct and will be treated as such as per NOSM University's **Academic Integrity Policy**.

Note for faculty: Faculty members are invited to select appropriate items from the list in Continuum of Uses and Examples in their statement based on where they want to permit or prohibit use of GenAl tools. This list can be personalized as desired.

If the use of GenAl is completely prohibited at all stages of the assignment, the following statement can be used All pieces of work submitted should be your own work. Any use of GenAl tools during the realization of this assignment constitutes academic misconduct and will be treated as such as per NOSM University's Academic Integrity Policy. The purpose of this assignment is to [XXX]; hence, the use of GenAl in this specific context would [YYY].

Examples of supporting rationales:

- It would affect learners' ability to learn and/or practice the material that they need to become knowledgeable about;
- The work submitted would not reflect your personal thoughts and experiences (notably, in the case of a reflective essay);
- The assignment uses sensitive and/or personally identifiable data that should not be inputted in a GenAl tool for data privacy and protection concerns;
- The risks of potential biased and/or erroneous outputs are too high in this specific context.

Assessment (Re-)Design

As the use of GenAl tools continues to increase, multiple faculty across the country and the world have started reviewing not only their curriculum, to better account for the rise of this technology, but also their assessments method, to better capture students' own learnings.

Some guidance has already been developed by faculty and within multiple other post-secondary institutions. We have some helpful resources below to support the NOSM U faculty in their own reflections on how to (re-)design their assessments to properly assess student learnings.

Questions for faculty

- Why does this assignment make sense for this course?
- What are specific learning objectives for this assignment?
- How might students use AI tools while working on this assignment?
- How might AI undercut the goals of this assignment? How could you mitigate this?
- How might AI enhance the assignment? Where would students need help figuring that out?
- Focus on the process. How could you make the assignment more meaningful for students or support them more in the work?

Source: Derek Bruff, former director of Vanderbilt University's Center for Teaching (blog post)

Practical strategies

- Shift the emphasis from assessing product to assessing process
- Incorporate tasks that ask students to demonstrate evaluative judgement
- Design nested or staged assessments
- Diversify assessment formats
- Incorporate more authentic, context-specific, or personal assignments
- Incorporate more in-class and group assignments
- Incorporate oral interviews to test understanding or application of knowledge

Source: University of Melbourne, Centre for the Study of Higher Education (<u>full guide</u>; <u>additional</u> <u>resources</u>)

Inspiration to get creative with assessment design

- <u>STRIVE: Emerging Considerations When Designing Assessments for Artificial Intelligence Use</u> (Anselmo, L., Eaton, S. E., Jivani, R. et al., February 2024)
- Exploring the Potential for Learning (Wilfrid Laurier University)
- <u>The Artificial Intelligence Assessment Scale</u> (Perkins, M., Furze, L., Roe, J. and MacVaugh, J. (April 2024)
- <u>Update Your Course Syllabus for ChatGPT</u> (Watkins, R., December 2022)
- <u>7 Strategies for Redesigning Assessment in Response to Artificial Intelligence</u> (Monsha, July 2024)

Acknowledging Use of GenAl

As outlined in NOSM U's *Guidelines for the use of GenAl in Teaching and Learning*, the use of GenAl tools should always be properly acknowledged. There are various ways to acknowledge the use of GenAl. Below are some helpful resources to guide you through how to cite the use of GenAl tools, but the preferred citation method should always be confirmed with the instructor responsible for the assigned work.

- APA Style
- Chicago Manual of Style
- <u>Canadian Open Access Legal Citation Guide</u>
- <u>MLA</u>

AI detection tools

Multiple post-secondary institutions across the country are urging faculty members to use caution regarding the use of AI detection tools, notably due to problems with the reliability of these tools and the high rate of false positives, the existence of multiple strategies to feint human authorship of AI-generated content, and more broadly the desire to shift away from a surveillance and punitive mindset towards building literacy around the limitations of GenAI tools and ethical use.

More specifically, research has shown that AI detection tools are more likely to lead to false positives for content written by individuals whose first language is not English, as well as neurodivergent individuals. We invite faculty to be careful and to not solely rely on AI detection tools in case of suspicion of academic misconduct, as allegations of academic misconduct can have serious repercussions on students' academic journey and overall well-being.

More information about the limitations of AI detection tools can be found below:

- Generative AI Detection Tools (University of San Diego)
- <u>AI-Detectors Biased Against Non-Native English Writers</u> (Myers, A., Stanford University Human-Centered Artificial Intelligence, May 2023)

Additional Resources

Additional resources to support the development of a good understanding of the state of AI in the sector, as well as to support with the development of AI literacy, are listed below.

AI in Post-Secondary Education

- <u>Observatory on AI Policies in Canadian Post-Secondary Education</u> (Higher Education Strategy Associates)
- Guidance for Generative AI in Education and Research (UNESCO, 2023)
- <u>Teaching with AI: A Practical Guide to a New Era of Human Learning</u> (José Antonio Bowen and C. Edward Watson, April 2024)
- <u>Co-Intelligence: Living and Working with AI</u> (Ethan Mollick)
- <u>Generalization bias in large language model summarization of scientific research</u> (Peters, U. and Chin-Yee, B., April 2025)

AI in Health Education

- <u>Al in Medicine: Supporting Learning and Practice</u> (Royal College of Physicians and Surgeons of Canada, April 2024)
- <u>A systematic review of the impact of artificial intelligence on educational outcomes in health</u> <u>professions education</u> (Feigerlova, E. Hani, H., Hothersall-Davies, E., 2025)
- <u>Artificial intelligence empowering public health education: prospects and challenges</u> (Wang, J. and Ling, J., 2024)
- <u>The role of artificial intelligence in modern medical education and practice: A systematic</u> <u>literature review</u> (Rasouli, S., Alkurdi, D. and Jia, B., July 2024)
- <u>Utilising artificial intelligence in developing education of health sciences higher education: An</u> <u>umbrella review of reviews</u> (Kovalainen, T., Pramila-Savukoski, S. and Kuivila, H.-M., April 2025)
- Generative AI for Healthcare Students and Professionals (Coursera)

Al in Healthcare

- <u>Al North</u>
- <u>Navigating AI in Healthcare</u> (Canadian Medical Protective Association)
- <u>CMPA's AI Webinar: Important Takeaways</u> (Canadian Medical Protective Association)
- <u>Considerations for navigating and implementing artificial intelligence (AI) in healthcare</u> (Canadian Medical Protective Association)
- <u>Revolutionizing healthcare: The role of artificial intelligence in clinical practice</u> (Alowais, S., Alghamdi, S., Alsuhebany, N., September 2023)
- Experts Explain AI: Ross Mitchell (CIFAR, 2025)

Contributions

NOSM U's *Guidelines for the Use of GenAl in Teaching and Learning* and these Supporting Resources are living documents and are meant to be updated as the technology and the sector's response evolves.

You can share your thoughts and additional resources to be considered at <u>provost@nosm.ca</u>. We thank you in advance for your contributions!