

AI in Teaching at Carleton: Opportunities and Challenges

A Report by the Working Group on the Use of Artificial Intelligence
(AI) in Teaching and Learning at Carleton University

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Introduction

Generative Artificial Intelligence (AI) tools have evolved to the point that they can generate content that is becoming more realistic and more difficult to distinguish from human intellectual property. Some of these tools¹ can effectively generate various types of text (e.g., ChatGPT, Jasper, GPT, Google's Bard, Bing AI), computer code (e.g., GitHub Copilot), equations (e.g., Wolfram), scientific papers with references (e.g., Elicit), or images (e.g., DALL-E, Midjourney, Stable Diffusion).

While there are many different generative AI models currently operating, ChatGPT has gained the most attention globally because it is freely available to the public, has a simple, user-friendly interface, and is able to interpret natural language prompts and generate unique responses based on predictive models it has been trained on.

The quality and validity of outputs from generative AI tools such as ChatGPT can be highly variable, depending on the prompt it has been given and the way the algorithms have been trained. ChatGPT may occasionally generate texts that sound convincing but contain factual inaccuracies and invented information² (e.g., references that do not exist, made-up definitions, etc.) (Arya, 2023). In addition, generated texts are often formulaic (University of Windsor, 2023). This is getting better as the model is trained and gains access to more and different data sets.

As of March 2023, ChatGPT can access information beyond training data, including the ability to access the Internet (it is already integrated into the Bing search engine), has new plugin capabilities, and can run the codes it writes (Blain, 2023; Hachman, 2023). Microsoft announced that it will soon integrate ChatGPT into its Office applications such as Word, PowerPoint, and Outlook (Borup, 2023). Still, it is important to know that ChatGPT “does not create high-level knowledge or an overall concept; instead, it simply guesses what the next word should be based on probability, as in auto-complete, which is now common in email clients” (Arya, 2023).

Impact on Education

These latest AI developments provide opportunities and challenges for post-secondary institutions. On one hand, they may provide opportunities for teaching innovations, re-thinking existing teaching and assessment practices, creating customized learning activities, and saving time for both students and instructors (Terwiesch & Mollick, 2023). In addition, generative AI tools force us to consider their impact on the job market, the type of skills and competencies that our graduates will need so that they are prepared for and stay competitive in the workforce, and to re-examine teaching objectives and learning outcomes both at the course and degree/program levels (Arya, 2023).

On the other hand, generative AI tools cause legitimate concerns and anxieties in relation to academic integrity standards as work created by generative AI tools can be more difficult to detect, and the use of detection tools is not a viable strategy. Deeply embedded in university programs and degrees is that students develop precise writing and critical thinking skills. The temptation of AI, if not engaged with carefully, can undermine students' ability to write and think critically.

As generative AI tools continue to evolve, discussions about their impact on education are ongoing. However, in the Canadian context, many educators agree that instead of trying to ban

¹ This is not an exhaustive list, but only sampling of generative AI tools. Larger databases of generative AI tools exist (see, for example, Contact North (2023) at <https://teachonline.ca/tools-trends/snapshot-ai-tools-create-and-curate-content-higher-education>).

² The term “hallucination” is used in the AI community to describe this phenomenon.

the use of generative AI tools, post-secondary institutions need be able to meaningfully adapt their educational practices much like they were able to do so in the past with previous technologies that raised concerns, such as calculators, spell and grammar-checkers, search engines, Wikipedia, etc. (Kovanovic, 2023; Monash University, 2023).

Document Purpose

Like all other post-secondary institutions, Carleton University is exploring the potential implications of generative AI tools in education. In February 2023, the Provost convened the working group, consisting of instructors, students, librarians, and professional staff, with the mandate to identify current opportunities and challenges related to generative AI in teaching and learning, and develop recommendations and guidelines for Carleton's teaching and learning community.

Working Group Membership

Chair

- David J Hornsby, Vice-Provost and Associate Vice-President (Academic)

Members:

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- Forest Anderson, Student, School of Computer Science, Faculty of Science
- Anne Bowker, Interim Dean, Faculty of Arts and Social Sciences
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The Working Group's recommendations below are drawn from a wide range of academic and non-academic publications, and similar documents and discussions that are currently happening at other post-secondary institutions in Canada and beyond³.

The pace of advancement of various features of generative AI has been astonishing in the last few months and this living document will be evolving and updated as new questions, insights, and research become available. Future updates of the document will be proposed by the Office of the Vice-Provost and Associate Vice-President (Academic) and will be considered, discussed, and approved by the Working Group on the Use of AI in Teaching and Learning at Carleton University, which will convene twice per academic year.

Opportunities: Generative AI and Teaching Innovation

As educators, we want to explore the potential benefits and opportunities generative AI brings (Mollick & Mollick, 2023). When students enter the workforce, AI will be part of the toolkit they use in their careers much as spell checkers are used in the workplace today. Knowing what the tools can and cannot do is an important and authentic skill and as such must be tested, vetted, and critiqued. When they incorporate generative AI in their course activities, instructors have an opportunity to develop students' AI competencies, help them understand principles and ethical concerns behind these technologies, and teach them how to critically evaluate them (Ng et al., 2023). At the same time, instructors also have an opportunity to develop their own AI competencies and enhance their teaching and assessment practices.

The proliferation of generative AI tools, combined with the rapid improvement of these tools, offers a unique opportunity for university instructors to examine their assumptions about the learning outcomes in their courses and to chart innovative ways to utilize these tools to support key student learning outcomes. The possibilities for innovation are only limited by our imaginations and thoughtful consideration of the ethical implications of using these tools.

Generative AI tools could provide students with personalized learning (e.g., give personalized feedback to students based on information provided by students), help post-secondary institutions with administrative processes (e.g., AI tools respond to questions from prospective students), and help instructors with their research tasks (e.g., generate ideas for research questions, suggest data sources, etc.) (UNESCO, 2023). For instructors, AI tools could be used to generate draft lesson plans, marking rubrics, exemplars, and discussion prompts (Liu et al., 2023). For students, AI could be used to overcome writer's block, act as a tutor (e.g., explaining computer code snippets) or help explore different perspectives (Ibid). They can also be used as initial idea generators, and in preliminary designs (Arya, 2023), while language learners can benefit from conversational interactions, immediate feedback, and improved confidence related to grammar, spelling, and style (Cai, 2023).

Recent developments include a subset of generative AI, referred to as domain-specific large language models (LLMs). These specialized models are designed to "capture the essence of a specific industry, and understanding of its unique terminology, context, and intricacies" (Ravinutala, 2023). These models can generate new content based on their training data

³ This document builds upon the work of our colleagues at the University of Toronto, the University of Windsor, York University, Toronto Metropolitan University, the University of Calgary, University College London, Monash University, the University of Witwatersrand, Johannesburg, and the University of Michigan.

(Lisowski, 2023). Because they are trained on data sets specific to a particular domain, they are more responsive and accurate. They are also less susceptible to hallucinations, thus providing enhanced experiences to users (Lisowski, 2023; Ravinutala, 2023). Domain-specific AI shows promise for the future in various sectors, including, but not limited to e-commerce, health care, and education. This potential is due to the ability of these models to generate outputs that are aligned with the standards and requirements of the respective industries (Ravinutala, 2023).

As with all technologies, instructors and students need to consider and evaluate potential risks, including how their data will be used and stored, concerns about authorship, inherent biases, and inequitable access⁴. There is also a risk of potentially harmful content and responses, even though organizations are attempting to reduce these risks. If instructors decide to ask students to use generative AI tools in their courses, they should be prepared to address these issues.

When considering whether to incorporate generative AI tools in their course, instructors need to start with determining whether these types of tools align with the course's learning outcomes. Learning outcomes should guide the knowledge and skills students will gain from the course and help determine how you will assess students.

While our understanding of the pedagogical implications of AI in education is still developing, a few examples of innovative strategies to integrate AI tools in instruction, created by Mike Sharples, Open University, UK, and published in [UNESCO Quick Start Guide](#) (2023) are provided in Appendix 2.

Because many generative AI tools are in relatively early stages or iterations, instructors should be prepared to work with students to evaluate the reliability and accuracy of AI supports to instructional processes, which can also serve to support student learning outcomes, both for content knowledge and skill outcomes using AI tools appropriately.

According to the Academic Integrity Council of Ontario (2023), AI “may provide students the ability to offload academic work or academic skills”. To ensure that this offloading benefits student, consider some of the Council's guidelines at “the micro (faculty) and meso (program) levels include⁵:

- Think about how artificial intelligence applies to vocational learning outcomes (VLOs), course content, learning outcomes, degree level expectations, experiential learning, learning assessment outcomes, and work integrated learning.
- Connect with industry partners and professions to learn *how* or *if* artificial intelligence is/will be used in their day-to-day work and activities.
- Consider the appropriateness of introducing artificial intelligence as a learning strategy if it *is* leveraged in the industries and professions students are studying toward so that we are preparing graduates for the careers they plan on pursuing.
- Demonstrate best practices when using artificial intelligence with students (e.g., include citations, references to its use in class).

Carleton University encourages teaching innovation and supports instructors who wish to try and/or adopt new pedagogical approaches and educational technologies. Generative AI tools are here to stay, and they open possibilities for rethinking how we design and teach our courses, including our assessment strategies. Particularly important will be for academic

⁴ See Appendix 4 for more details.

⁵ For a full list of recommendations, please see the [Academic Integrity Council of Ontario](#).

disciplines to rethink how they can continue to use essays and other forms of written assessments to evaluate students' knowledge and skills in light of generative AI.

Carleton's Teaching and Learning Services has established the Future Learning Innovation Fellowship that provides funding and support for instructors and academic units interested in exploring how emerging technologies, including AI tools, can be incorporated into pedagogical practices and their potential impact. The results of the projects funded through the Fellowship and the teaching and learning experiences through the Future Learning Lab will help inform our future applications of these rapidly evolving tools.

Challenges: Generative AI and Academic Integrity

Carleton University values academic integrity and requires it from all community members. Student academic conduct is governed by the Academic Integrity Policy (available at the University Secretariat website), which is implemented at the Faculty level across the university.

We recommend the following guidelines concerning the use of generative AI:

1. Unless explicitly permitted by the instructor in a particular course, any use of generative AI tools to produce assessed content (e.g., text, code, equations, image, summary, video, etc.) is a violation of academic integrity standards. The academic integrity statement in the course outline should be adjusted to clearly indicate this to students.
2. Instructors may explicitly permit the use of generative AI (e.g., ChatGPT and similar) in their courses, depending on the course teaching objectives and learning outcomes. The academic integrity statement in the course outline, assignment, test, and examination guidelines should be adjusted to clearly indicate this permission.
3. If instructors permit the use of generative AI tools, a course outline and guidelines for each assessment should include clear and detailed instructions on:
 - a. which generative AI students may use;
 - b. what will instructors consider the acceptable use (e.g., can ChatGPT or similar be used for correcting spelling and grammar, enhancing sentence and paragraph structure, paraphrasing, finding preliminary sources, creating a paper outline, brainstorming, translation, etc.?) (Eaton, 2022; University of Calgary, 2023).
4. The university should update examples of academic misconduct in the Academic Integrity Policy to specifically include any unauthorized use of generative AI tools.
5. The deans' offices and other relevant parties may explore the feasibility of creating a centralized Academic Integrity Office. This office could support activities of line/disciplinary Faculties, collect data related to academic integrity at the university level, and maintain a centralized academic integrity website with resources for students and instructors, as well as links to Faculty-specific information.
6. The deans offices, Ombuds Services, the Registrar's Office, Teaching and Learning Services, and the Library should collaborate to create an FAQ page for students and instructors on the ethical and unethical uses of generative AI tools that can be included in the course outline for reference. For instance, this can include how to cite the usage of such tools that aided in the creation of the assignment.
7. Instructors are discouraged from using any AI detectors (e.g., GPTZero, Turnitin AI detection software, etc.). Instructors, however, can reserve rights to ask students to submit evidence of their work, including rough notes, drafts, video-recordings, photocopies or screenshots of the

cover page and first cited page of each reference source, or other material as relevant to the assignment. Instructors may also require that students explain the steps they took when completing the assignment. This reserved right should be stated in a course outline.

8. Given the limits of current technology, instructors should not submit results of AI detection software as the sole evidence when opening alleged instructional offence cases. AI detectors can produce false positives and false negatives, which may negatively affect students and lead to wrongful convictions in the context of applying the Academic Integrity Policy. Some recent research shows that AI detectors are “biased against non-native English writers” whose writing “exhibited limited linguistic variability and word choices” (Liang et al., 2023).

9. The use of AI detectors should be reviewed on a regular basis by the Teaching and Learning Computing Committee with the intent of determining the suitability of new and/or improved detection and recommending it to Carleton’s community.

We recognize that the detection of AI-generated content may be a significant challenge for instructors. For example, disciplines that have traditionally relied on the essay as a primary mode to assess learning may encounter unique challenges to certify the originality of student work. ChatGPT now can be accessed with a phone and is becoming very good in answering multiple-choice type of questions, while some new open-source AI tools (e.g., Orca) can be used without internet connection. Teaching and Learning Services will work with instructors and departments to gather disciplinary experiences and insights, develop guidelines, and make them available to all instructors.

We provide below a few mitigation strategies developed at other universities or discussed within the literature. Still, it should be acknowledged that instructors should not underestimate AI capabilities as they can circumvent many of these strategies (e.g., generate any type of outlines, rough notes after the fact, slides and notes for oral presentations, while AI technology such as VALL-E can generate realistic spoken audio using a sample of someone’s voice.)

Short-Term Strategies

- Ask students to submit an explanation about steps they took when approaching their assignment (this can be video recording piece) (Rudolph, Tan, & Tan, 2023).
- Consider different types of assessments, from proctoring to the use of digital monitoring tools, to oral exams (Susnjak, 2022).
- Consider incorporating cognitive interviews as an assessment component where students routinely narrate the process, they followed to generate assessed content.
- Add specificity to the assigned topic (e.g., ask students to reference course materials and class discussions) (CRLT, University of Michigan, 2023).
- Incorporate assignments such as interviews, reviews of talks and other events on campus or in the local Ottawa community, and/or close reading of the text (where applicable).
- Have students do certain assessments during class time (Rudolph, Tan, & Tan, 2023). However, be mindful of the needs of various students – students with disabilities may need more time to complete the assignment (CRLT, University of Michigan).
- Ask students to accept a statement/confirmation that all the work is their own unless the use of generative AI tools has been specifically authorized (UCL, 2023).
- Require students to append citation screenshots to their assignment (University of Central Florida, 2023).

Longer-Term Strategies

- Discuss ChatGPT technology and its limitations with your students (University of Toronto, 2023; Rudolph, Tan, & Tan, 2023).
- Assignment Design
 - Sequence major assignments to include project proposals/outlines, multiple drafts, annotated bibliographies (CRLT, University of Michigan, 2023).
 - Adjust the evaluation scheme and place more value on the assessing process rather than the finalized product (Anwar et al., chapter 4, date unknown).
 - Decrease the incentive to use AI content generation tools through increasing [transparency in assessment criteria](#). Transparency in assessment criteria is helpful for student learning (Baloo et al., 2018; Jönsson & Prins, 2018).
 - Develop course and program ePortfolio to support continuous, comprehensive, and multimodal assessments that include reflection and applications of learning outcomes and demonstrate a variety of literacies (textual, visual, digital).
 - Ask students to create videos, animations, web pages, performances, presentations, etc. (Rudolph, Tan, & Tan, 2023).
 - “Avoid assignments and examinations that are so formulaic that nobody could tell if a computer completed them” (p. 14, Rudolph, Tan, & Tan, 2023)
 - Ask students to integrate multiple sources in their assignment (Rudolph, Tan, & Tan, 2023).
 - Have students work on peer editing and peer commentary as part of the evaluation and writing process, so that they have to comment and make suggestions and respond to other students' writing. (CRLT, University of Michigan, 2023).
 - Extend “flipped” learning where students review readings and lecture materials on their own time, and then demonstrate, apply, and have hands-on activities during the scheduled class time (Montclair State University, 2023).
 - Ryan Watkins from George Washington University has [proposed a range of suggestions for assessments](#) that not only mitigate the risk of AI but also encourage students to develop their AI literacy. These include having students generate ChatGPT responses and critiquing, evaluating, and visibly revising them by using track changes in MS Word to explain their thinking and steps in working on their assignment; creating mind maps to illustrate connections between ideas, concepts, theories, and approaches (2022).

What Can Instructors Do in Cases of Suspected Academic Misconduct?

If instructors suspect that an assignment has been completed with unauthorized use of generative AI tools, they should not confront the student or engage in punitive actions. Instead, they should proceed as with any other potential allegation of academic misconduct and report them to the dean's office.

As mentioned previously, instructors should not rely on AI detection tools as the sole sources for allegations of academic misconduct. Instructors should provide as much background information and details as possible about the context of their course and/or discipline that would allow deans offices to gain a better understanding of each potential case. Further, they should carefully document any problems with a student's assignment that would violate the Academic Integrity Policy such as missing, inaccurate or fictitious references.

Potential signs of the use of generative AI could include:

- Absence of personal experiences, opinions, or insights (Taylor Institute, 2023).
- Generic and repetitive language (Taylor Institute, 2023).

- References are inconsistent, non-existent, or invented (University of Waterloo, date unknown).
- When asked, students cannot produce any research notes or summarize the main points of the paper.

Next Steps

Deans' offices and the Office of Vice-President (Students and Enrollment) in collaboration with Ombuds Services will:

- Propose to Senate revisions to the Academic Integrity Policy, which include generative AI tools among the Policy's examples of academic violations.
- Develop FAQs and information sessions or workshops for students about the ethical use of generative AI in learning, raising awareness of the risk of an academic integrity offence, concerns about privacy and authorship, etc.
- In collaboration with Scheduling and Examination Services explore challenges and propose a strategy related to AI and academic integrity as applicable to formally scheduled examinations.

Deans' offices will:

- Discuss with academic units the challenges that AI generative tools pose for the existing assessment and evaluation practices and explore the resources and support needed to assist instructors in considering innovative formats for assignments at the level of the Faculty.
- Assess with academic units the current allocation of TAs hours in individual courses and explore creative ways in which TA resources can be used to encourage the use of formative assessment, a scaffolding approach to the writing process, and the use of marking rubrics in courses that primarily rely on the written assessment.

MacOdrum Library will:

- Help students develop digital literacy skills that include an understanding of generative AI tools.
- Offer guidance on effective strategies for validating sources and evaluating the quality of information resources.
- Support Library users and staff in learning about generative AI tools, their uses and limitations, and corresponding privacy and ethics questions.
- Update citation guides to include information about how to cite generative AI tools.

Teaching and Learning Services will work with individual instructors, departments, schools, Faculties, Ombuds Services, and Student Affairs to:

- Provide instructors with information on generative AI tools, their capabilities, and shortcomings, and provide demonstrations about their use.
- Raise awareness of issues that need to be discussed with students (e.g., privacy, intellectual property, etc.) and work with instructors on strategies for mitigating risks when incorporating generative AI tools into the curriculum. Also collaborate with peer institutions to learn about their experiences and approaches related to the adoption of generative AI tools.
- Create resources for students on the ethical use of generative AI tools in coursework, assignments, tests, and exams.
- Work with faculty members – early adopters - to develop disciplinary resources and examples on the use of generative AI tools in teaching and learning.
- Provide mechanisms for encouraging cross-campus discussions (e.g., speaker series)

on issues related to the use of generative AI tools in teaching and learning.

- Work with instructors who teach academic writing and writing in the disciplines to identify and address the specific set of challenges brought by generative AI tools in achieving their teaching objectives and develop mitigation strategies.
- Explore technologies that can help with peer-review of written projects (e.g., Feedback Fruits, Perusall, Crowdmark, etc.)
- In collaboration with Information Technology Services explore the feasibility of obtaining a license for ChatGPT- 4 or similar.
- Suggest assessment strategies that incorporate generative AI tools, where relevant to the course objectives and learning outcomes.
- Develop information sessions for teaching assistants to familiarize them with the current development around AI tools and the implications for teaching assistant tasks (e.g., grading, detecting AI-generated content, etc.)

Appendix 1: References

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Appendix 2: Ideas for Integrating Generative AI in Instruction, UNESCO Quick Start Guide, 2023

Role	Description	Example of Implementation
Possibility engine	AI generates alternative ways of expressing an idea	Students write queries in ChatGPT and use the Regenerate response function to examine alternative responses.
Socratic opponent	AI acts as an opponent to develop and argument	Students enter prompts into ChatGPT following the structure of a conversation or debate. Instructors can ask students to use ChatGPT to prepare for discussions.
Collaboration coach	AI helps groups to research and solve problems together	Working in groups, students use ChatGPT to find out information to complete tasks and assignments.
Guide on the side	AI acts as a guide to navigate physical and conceptual spaces	Instructors use ChatGPT to generate content for classes/courses (e.g., discussion questions) and advice on how to support students in learning specific concepts.
Personal tutor	AI tutors each student and gives immediate feedback on progress	ChatGPT provides personalized feedback to students based on information provided by students or instructors (e.g., test scores).
Co-designer	AI assists throughout the design process	Instructors ask ChatGPT for ideas about designing or updating a curriculum (e.g., rubrics for assessment) and/or specific goals (e.g., how to make the curriculum more accessible).
Exploratorium	AI provides tools to play with, explore and interpret data	Instructors provide basic information to students who write different queries in ChatGPT to find out more. ChatGPT can be used to support language learning.
Study buddy	AI helps the student reflect on learning material	Students explain their current level of understanding to ChatGPT and ask for ways to help them study the material. ChatGPT could also be used to help students prepare for other tasks (e.g., job interviews).

Motivator	AI offers games and challenges to extend learning	Instructors or students ask ChatGPT for ideas about how to extend students' learning after providing a summary of the current level of knowledge (e.g., quizzes, exercises).
Dynamic assessor	AI provides educators with a profile of each student's current knowledge	Students interact with ChatGPT in a tutorial-type dialogue and then ask ChatGPT to produce a summary of their current state of knowledge to share with their instructor/for assessment.

Appendix 3: Examples of the Academic Integrity Statement

Example #1: AI Tools Not Allowed

(Current Academic Integrity Policy; the bolded text may be added to include AI tools if approved by the Senate)

1. Plagiarism

Plagiarism is presenting, whether intentionally or not, the ideas, expression of ideas, or work of others as one's own, including content generated by AI tools.

Plagiarism includes reproducing or paraphrasing portions of someone else's published or unpublished material, regardless of the source, and presenting these as one's own without proper citation or reference to the original source. Examples of sources from which the ideas, expressions of ideas or works of others may be drawn from include but are not limited to: books, articles, papers, literary compositions and phrases, performance compositions, chemical compounds, art works, laboratory reports, research results, calculations and the results of calculations, diagrams, constructions, computer reports, computer code/software, material on the internet, **content generated by artificial intelligence (AI) tools**, and/or conversations.

2. Co-operation or Collaboration

Students shall not co-operate or collaborate on academic work when the instructor has indicated that the work is to be completed on an individual basis. **This includes unauthorized use of generative artificial intelligence (AI) tools.** Failure to follow the instructor's directions in this regard is a violation of the standards of academic integrity. Unless otherwise indicated, students shall not co-operate or collaborate in the completion of a test or examination.

Students are responsible for being aware of and demonstrating behaviour that is honest and ethical in their academic work (see www.carleton.ca/registrar).

Instructors at both the graduate and undergraduate level have the responsibility to provide clear guidelines concerning their specific expectations of academic integrity (e.g., rules of collaboration or citation) on all course outlines, assignment and examination material.

Example #2: AI Tools Allowed

(Adapted from Mollick & Mollick, 2023; the authors gave their permission to use their language or adjust it to fit in one's own course)

I expect you to use AI (e.g., ChatGPT and image generation tools) in this class. In fact, some assignments will require it. Learning to use AI is an emerging skill and I will provide instructions on how to use them. I am happy to meet and help you with these tools during office hours or after class.

Be aware of the limits of ChatGPT, such as the following:

- If you provide minimum-effort prompts, you will get low-quality results. You will need to refine your prompts in order to get good outcomes. This will take work.
- Do not trust anything ChatGPT says. If it gives you a number or fact, assume it is wrong unless you either know the answer or can check with another source. You will be

responsible for any errors or omissions provided by the tool. It works best for topics you understand.

- AI is a tool, but one that you need to acknowledge using. Please include a paragraph at the end of any assignment that uses AI explaining what you used the AI for and what prompts you used to get the results. Failure to do so violates academic integrity policy.
- Be thoughtful about when this tool is useful. Do not use it if it is not appropriate for the case or circumstance.

Appendix 4: Ethical and Privacy Considerations When Using Generative AI Tools in Teaching

When incorporating generative AI tools as part of course design, instructors should consider privacy and ethical issues:

- **Data privacy, ownership, authorship, copyrights:** Companies that work on the development of generative AI tools (e.g., OpenAI) may ask users to open accounts by providing identifiable information (e.g., email address, Google account, phone number). Privacy policies usually state companies can use and share the data as they wish (Caines, 2023; Wilfried Laurier University, 2023). Carleton has guidance on the use of third-party tools. Third-party tools can be helpful for teaching and learning and can provide extended course functionality. However, instructors need to be aware that most third-party tools are not integrated into Carleton systems, so training, technical support, and troubleshooting are not available from the university. Instructors are actively discouraged from adopting a third-party tool that has not been cleared for privacy and security by the university.
- **Unpaid labour and the commercialization of student text:** Generative AI tools may be enhanced by the interactions with users who engage with them. Requiring students to use these tools can mean providing free labour for companies that may become commercial later in their development.
- **Inequitable access:** Several AI tools have created for-pay subscription plans. For-pay models that are not within reach of all students and can create inequitable access for students from marginalized groups, creating advantages for those who can pay and disadvantages for those who cannot. On the other hand, some authors argue that AI tools can “lower the financial cost of personalized tutoring,” especially for students from equity deserving groups, who cannot realize their full educational potential” (Chine et al., 2022, p. 366). In addition, generative AI tools may be unavailable in some countries due to government bans, censorship, or other restrictions (UNESCO, 2023).
- **Inherent bias and discrimination:** Generative AI tools can replicate and perpetuate existing biases (e.g., racist, sexist beliefs), toxic speech patterns (Bolukbasi et al., 2016; Welbl et al., 2021), or specific worldviews (Bender et al., 2021). Bias can be present in the training data, the coding, the validation process, and in the presentation of the results. Bias and discrimination can be hard to detect because Generative AI tools are complex, and technologies are perceived as neutral.
- **Lack of regulation:** Currently, generative AI tools are not regulated, and their rapid development prompted more than 2,700 academics and leaders from the private sector to call AI labs to pause the training of AI systems more powerful than GPT4 (UNESCO, 2023; Future of Life Institute, 2023).

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Appendix 5: A Few Resources on Generative AI in Teaching

- [AI in Higher Education Resource Hub](#). Resources collected by Contact North are organized around several topics:
 - Latest developments
 - Background on AI
 - Learning experiences, course creation and learner support
 - Assessment, grading, and examinations
 - Academic policy and concerns about AI – ethics, bias, and equity.
- [ChatGPT through an Education Lens](#) - these resources are collected by Jessica Adams, Leslie Brophy, Jackie Ediger, Lynne Herr and Nicole Zumpano and they are organized by the following topics:
 - What are AI chatbots
 - What is ChatGPT?
 - Try ChatGPT
 - Dive deeper with chatbots
 - Curriculum impact
 - Educator uses
 - ChatGPT challenges
 - Podcasts
 - Articles
 - Videos
 - Additional resources
 - Policy and use guidance
 -
- [Generative Artificial Intelligence in the Classroom](#). Resources from the Centre for Teaching Support & Innovation, University of Toronto
- [The Sentient Syllabus Project](#) by Prof. Boris Steipe (2022) – Pedagogical resources related to the use of AI.

Appendix 6: Generative AI and Academic Integrity – Examples from Canadian Universities

Brock University <https://brocku.ca/pedagogical-innovation/resources/guidance-on-chatgpt-and-generative-ai/#1676041694216-133dc415-b8f6>

Q: Are students permitted to use AI tools to complete assessments?

A: The University expects students to complete assignments on their own, without any outside assistance, unless otherwise specified. Instructors are strongly encouraged to speak to their students about what tools, if any, are permitted in completing assessments. Written assignment instructions should indicate what types of tools are permitted; vague references to ‘the internet’ will generally not suffice today.

If an instructor indicates that use of AI tools is not permitted on an assessment, and a student is later found to have used such a tool on the assessment, the instructor should inform their Chair as the first step in [Brock University Academic Integrity Policy](#).

Some students may ask if they can create their assignment outline or draft using ChatGPT, and then simply edit the generated first draft; consider in advance of discussing the assignment with your students what your response to this question might be, and perhaps address this question in advance.

Q: Would the university classify the use of generative AI systems as an academic offence?

A: If an instructor specified that no outside assistance was permitted on an assignment, then the use of ChatGPT can be considered unacknowledged assistance. Such a categorization is in keeping with how the University has classified use of other generative and unauthorized technology tools, such as Chegg, in the past.

Toronto Metropolitan University <https://www.torontomu.ca/academicintegrity/ai/>

Currently, [Policy 60](#) does not explicitly address AI usage. However, if a student were to submit text, images, designs, or any other academic work generated by AI *without proper attribution*, instructors could consider that plagiarism. Further, instructors could consider AI use to be cheating as described in Policy 60, Appendix A, Section 3.1:

“having ready access to and/or using aids or devices (including wireless communication devices) not expressly allowed by the instructor during an examination, test, quiz, or other evaluation.”

* Please note that Policy 60 is currently under review, and we anticipate that specific language on artificial intelligence will be added.

Q: Can students use Ai to assist with graded assignments and/or tests?

A: Not unless the student receives permission from the instructor.

Q: What are some example applications that professors might consider to be academic misconduct if used for graded assignment?

A: Grammarly, Quillbot, ChatGPT, ParaphraserAI, DeepL Translator, Google Translate, OpenAI Playground

University of Guelph <https://news.uoguelph.ca/2023/03/university-of-guelph-statement-on-artificial-intelligence-systems-chatgpt-academic-integrity/>

We affirm the following:

1. Students' work must reflect their unique intellectual capacity and demonstrate the application of critical thinking and problem solving. Unauthorized use of AI to complete assessments violates the fundamental intellectual purposes of the University and does not demonstrate student achievement of course learning outcomes.
2. Submission of materials completed by AI, without permission of the instructor, constitutes an offence under the University's academic misconduct policies, either as a form of plagiarism or the use of unauthorized aids.
3. Acceptable use of AI should be determined by the course instructor and may vary across disciplines, programs, and types of assessments. In setting out course requirements and assessment criteria, the instructor should specify allowable uses of AI, if any, through the course outline and/or the learning management system (e.g., CourseLink). Clarity about the acceptable use of AI is critical for students and instructors. Students are responsible for appropriately referencing how and to what extent they have used AI in assessments in keeping with university and course requirements.

University of Ottawa <https://saea-tlss.uottawa.ca/stageit/en/chatgpt-faq#would-the-university-classify-use-of-generative-ai-systems-as-an-academic-offence>

If an instructor specified that no outside assistance was permitted on an assignment, the University would typically consider use of ChatGPT and other such tools to be use of an "unauthorized aid" under the [Academic regulation I-14](#), or as "any other form of cheating." It is also vital to note that because generative AIs are trained on existing data, they are at risk of 'generating' text that was in fact written by a real person in the past. This can result in a student unintentionally plagiarizing a source on which the model was trained.

University of Toronto <https://www.viceprovostundergrad.utoronto.ca/strategic-priorities/digital-learning/special-initiative-artificial-intelligence/>

The University expects students to complete assignments on their own, without any outside assistance, unless otherwise specified. Instructors are strongly encouraged to speak to their students about what tools, if any, are permitted in completing assessments. Written assignment instructions should indicate what types of tools are permitted; vague references to 'the internet' will generally not suffice today. If adding a prohibition on AI tools to assignment instructions, it is best to suggest that the 'use of generative AI tools' is prohibited, as opposed to the use of one particular tool, such as ChatGPT. There are many generative AI tools available today.

If an instructor indicates that use of AI tools is not permitted on an assessment, and a student is later found to have used such a tool on the assessment, the instructor should consider meeting with the student as the first step of a process under the *Code of Behaviour on Academic Matters*.

Some students may ask if they can create their assignment outline or draft using ChatGPT, and then simply edit the generated first draft; consider before discussing the assignment with your students what your response to this question might be, and perhaps address this question in advance.

University of Waterloo <https://uwaterloo.ca/academic-integrity/artificial-intelligence-and-chatgpt>

At present, it is important for instructors to be explicit about whether artificial intelligence or tools like ChatGPT are allowed to be used to complete assignments, tests, or exams, and if so, the extent to which it is allowed, and if it should be cited and how to cite it. A student who does not comply with the instructors' rules about the use of such tools will be subject to Policy 71 and an investigation into academic misconduct.

From the Provost's letter:

Using ChatGPT (or similar tools that generate text, code, or visual images) for content generation and *submitting it as one's own original work is a violation of the [University of Waterloo's Policy 71 \(Student Discipline\)](#)*. Use of these tools may be explicitly permitted by an instructor (as stated in assignment guidelines or a course outline, for example) for teaching and learning purposes that do not include claiming AI-generated output as original work.

University of Windsor <https://www.uwindsor.ca/openlearning/572/chatgpt-and-ai-in-teaching-and-learning>

Q: Are students allowed to use AI in their assessments?

A: This is a topic of significant global debate at present. At UWindsor, the existing policies in the student code of conduct and by-law 31 provide a mechanism for disallowing these assistive tools if an instructor chooses to do so. Instructors can decide whether the use of AI tools is permitted in an individual assessment or not and should consider each assessment individually when determining whether AI tools may be acceptable or not, rather than a blanket ban.

Q: Is the use of AI in assessments plagiarism or an academic integrity offence?

A: This is a question that is being debated globally and does not yet have a settled answer, including among academic integrity scholars. At present, most appear to recommend not automatically considering the use of such tools as plagiarism under the most common definitions used in PSE, but they may be considered academic misconduct for the use of an unauthorized aid in completing an assessment. Each case would need to be investigated on its own merits, and at present it would be virtually impossible to provide reliable and valid evidence that a student had used such a tool.

York University https://www.yorku.ca/unit/vpacad/academic-integrity/wp-content/uploads/sites/576/2023/03/Senate-ASCStatement_Academic-Integrity-and-AI-Technology.pdf

To promote clear and consistent practices, students across York are not authorized to use text-, image-, code-, or video-generating AI tools when completing their academic work unless explicitly permitted by a specific instructor in a particular course.

Otherwise, using AI tools to aid in academic work (in whole or part) that is submitted for credit constitutes one or more breaches under York's Senate Policy on Academic Honesty ("Senate Policy"). Specifically, their use could be considered to be cheating, which is defined as "the attempt to gain an improper advantage in an academic evaluation" (Senate Policy, section 2.1.1). Associate Deans who are involved in enforcing Academic Honesty at York can consider how different types of unauthorized student use of AI technology are already captured in the non-exhaustive list of "cheating" examples currently offered in the Senate

Guidelines under the Senate Policy: for instance, “obtaining assistance by means of documentary, electronic or other aids which are not approved by the instructor” (Senate Policy, section 2.1.1).

Additionally, the unauthorized use of AI tools (such as image-generating AI, like DALL-E) could be considered to be plagiarism. Plagiarism occurs when another’s work is presented as one’s own without proper attribution, including “another’s artistic or technical work or creation” (Senate Policy, section 2).

University of British Columbia <https://academicintegrity.ubc.ca/chatgpt-faq>

The use of ChatGPT or other generative AI tools does not automatically equate to academic misconduct at UBC. At this time, the use of artificial intelligence tools is a course-level decision and there is no overall ban on its use in teaching and learning.

- If using ChatGPT and/or generative AI tools on coursework has been **prohibited** by the instructor, then using these tools would be considered to be academic misconduct.
- If using ChatGPT and/or generative AI tools has been **permitted** by the instructor, then instructors should make sure to convey the limitations of use and how it should be acknowledged, and use should stay within those bounds.
- If the use of ChatGPT and/or generative AI tools has **not been discussed or specified** by the instructor, then it is likely to be considered as prohibited as an example of the “use or facilitation of unauthorized means to complete an examination or coursework” and more specifically as “accessing websites or other online resources not specifically permitted by the instructor or examiner” (Discipline for Academic Misconduct, [Vancouver](#) and [Okanagan](#) 3.1.b.iv), and potentially plagiarism (3.1.e).

Students should not assume that all available technologies are permitted. If students are not sure about whether AI tools are allowed, as with any tool, they should ask their instructor for clarity and guidance.

University of Saskatchewan <https://academic-integrity.usask.ca/chatgpt-students.php>

Q: Can I use LLMs such as ChatGPT to help complete an assignment?

A: Only use LLMs such as ChatGPT if given explicit permission by your instructor. Using ChatGPT or similar tools without permission risks your academic integrity.

If you have been given permission to use LLMs, then you will need to cite this information so that your reader clearly understands which text was generated by a program like ChatGPT and how this text was generated (e.g., the keyword prompts that were used). For more information, refer to “How should I cite text that has been generated by LLMs?”

Q: Is using LLMs such as ChatGPT a form of plagiarism?

A: It depends! If your instructor has explicitly stated that you can use assistance like LLMs then you should also ask them for formatting expectations or guidance to avoid plagiarism concerns. **However, if permission has not been given or if you have not clearly attributed or cited the work, then you risk an accusation of plagiarism⁶.**

⁶ Emphasis in the original.