# STL AI Working Group recommendations to STL

## Preamble

Generative AI or Large Language Models (LLMs) are systems that can be used to create new content, including audio, code, images, text, simulations, speech, and videos (McKinsey & Company, 2023). Although tools using these models came to most people's attention with the public launch of ChatGPT in November 2022, generative AI tools have for some time been supporting and enhancing existing ways of doing tasks in society as well as extending human capabilities and opening new possibilities. The ready access of generative AI tools presents a societal disruption with far-reaching implications. Given the magnitude and potential of the technology in all aspects of our lives, these implications naturally include the academy. Given the diversity of the academy, it is not surprising that there is a continuum of opinions from experts and thought leaders as to their potential impact on teaching and learning in higher education.

While ChatGPT has become shorthand for a wide range of tools, the STL AI Working Group (STL AI WG) recommends using the term generative AI to encompass the technology in all its forms. For a clear and concise overview of the potential uses of generative AI tools in higher education, see the UNESCO-produced "Quick Start Guide" on ChatGPT and AI in higher education, published in April 2023, which includes a consideration of their accompanying challenges and ethical implications.

Some early comments and questions from McGill instructors indicated a desire to make the University a "ChatGPT-free zone." Given the potentially negative implications of integrating generative AI into the classroom, and indeed into the University culture itself, this desire may be understandable. However, even if this were a shared desire, it would be an extremely difficult vision to implement. AI detection tools like GPT-Zero are probabilistic and cannot reliably determine if content is AI generated, resulting in both false positive and negative reports, with the former having a potentially harmful impact on students. As more tools become available (such as Google Bard), detection will become yet more difficult because GPT-Zero is specifically geared to detect content generated by OpenAI. Human inspection, especially with practice, may be able to flag content that is likely generated by AI by identifying false references and acute differences with other writings by the author, but this puts a significant burden on instructors and teaching assistants. In short, detection and enforcement will be a major challenge. Whatever policies are adopted will be enforced largely through self-compliance. Additionally, as Peters (2023) highlights in a University Affairs article, the rise of generative AI tools is encouraging universities to take a holistic approach to the concept of academic integrity.

Given anecdotal evidence suggesting that generative AI tools are already in heavy use by the University community, the STL AI WG recommends that their use be guided to ensure that it supports McGill's Mission and Values, respects academic rigour, and addresses privacy and academic integrity considerations. Further, during its discussions, the STL AI WG noted that the use of generative AI will not be limited to the classroom and identified administrative functions that may be impacted by their use.

## How the STL AI WG proceeded

The initial discussion, held at the January 18, 2023, meeting of the Subcommittee on Teaching and Learning (STL), resulted in the identification of two avenues to follow. The first, requiring attention in the short-term, is how generative AI tools may impact the disciplinary framework that is based on the concepts of plagiarism and cheating. The Office of the Dean of Students, responsible for academic integrity and the student disciplinary process, will manage this aspect. The Office has commented that the Code of Student Conduct requires that work submitted for evaluation by students is their original work unless clearly indicated otherwise. Software that flags submitted work for potential plagiarism or cheating has been available for many years, but this is not sufficient evidence alone for a finding that the Code has been violated. The Code of Student Conduct requires that evidence is clear, convincing, and reliable, and this must be evaluated by a disciplinary officer. As mentioned, the likelihood of false positives with generative AI tools is higher than with previous text matching software, but the process of assessing a potential violation is the same.

Academic Integrity is paramount to the quality and legitimacy of our students' education, and generative AI use will increasingly influence how we define academic integrity. Importantly, as generative AI evolves in the coming months and years, its use will become more difficult to discern regardless of instructors' familiarity with their students' work. Given these conditions, the disciplinary route is not privileged. Rather, instructors are encouraged to enhance their knowledge of their students' strengths and weaknesses, augment approaches to instruction that incorporate meaningful interactions between the students and the instructor, and build assessment practices that take the use of generative AI into account. Explicit discussion of when and how generative AI can be used is part of that education. If an instructor becomes aware that generative AI has been used to complete an assignment, exam, or other assessment on which the instructor has explicitly prohibited its use, instructors are encouraged to bring an allegation of misconduct to the disciplinary officer. Above all, however, our focus is on the integrity of the education itself and not on punitive approaches to the use of generative AI.

The second avenue involved forming the STL AI WG to address the implications of generative AI tools for teaching and learning at McGill. The STL AI WG was mandated to examine the potential impacts of generative AI on teaching and learning, specifically assessment and learning outcomes, but leading also to broader reflections on the goal of a university education. The STL AI WG was expected to submit a report with recommendations by the end of the academic year. Given the tight timeline, the STL AI WG established an expedited plan for exploration and consideration of the issues. The goal was to gather information about the technology and establish a guiding framework for our recommendations. The STL AI WG met on eight occasions and engaged in productive discussions that included:

- A presentation by Prof. Joelle Pineau on the current and future capabilities and limitations of LLMs based generative AI tools. Prof. Pineau is a Professor and William Dawson Scholar at the School of Computer Science at McGill, and Vice-President, AI Research at Meta, where she leads the Fundamental AI Research team.
- Two discussions on ethical considerations of generative AI tools led by working group members Prof. Jocelyn Maclure and Prof. Lindsay Holmgren.
- Discussion and resources sharing an MS Teams group; see Appendix II for selected resources.

The discussions on ethics led the STL AI WG to adopt the 2018 Montréal Declaration for a Responsible Development of Artificial Intelligence as our reference point. The ten principles they articulate are: 1) Well-being, 2) Respect for autonomy, 3) Protection of privacy and intimacy, 4) Solidarity, 5) Democratic participation, 6) Equity, 7) Diversity inclusion, 8) Caution, 9) Responsibility, and 10) Sustainable development. Note that the UNESCO Recommendation on the Ethics of Artificial Intelligence, adopted by UNESCO on November 2021, is wider-reaching in scope and provides an additional guide to inform reflections on the integration of generative AI in education in general.

During the course of the STL AI WG meetings, the question emerged about the potential utility of McGill issuing a clear set of learning outcomes for our graduates. In other words, what are the skills, knowledge, and values that are targeted by a McGill education? Such a discussion goes far beyond the mandate of this working group, but the members did want to signal that the time may be right for such a discussion at the University level. Specifically, to what extent is the development of both original thought and critical thinking understood to be a primary goal of a McGill education?

## Recommendations to APC

The STL AI WG makes two recommendations.

***Recommendation 1*** **is that APC endorse the following five principles that constitute an operational framework for McGill to integrate generative AI tools into the academic mission.**

> **First principle**: **The University community is educated about what generative AI tools are, how they work, and the opportunities and challenges they entail**. Educational programming will be developed and delivered centrally and be provided for staff, students (beginning in their first year), and instructors, as well as at the Faculty level. The educational offerings may take the form of self-paced modules, for-credit courses, or other modalities. The educational options will ensure that students and instructors are able to:
>
> - explain the ethical implications of the use or non-use of such tools,
> - identify when the use of generative AI tools is appropriate,
> - identify the biases and normative tendencies inherent in generative AI tools,
> - identify the affordances offered by generative AI tools,
> - respect intellectual property, academic integrity, and privacy considerations if using the tools.
>
> **Second principle**: **University leadership and instructors ensure that when used, generative AI tools play a positive role in the accomplishment of the academic mission.** The leadership ensures that conditions are in place for the development of guidelines and resources to support instructors with addressing generative AI in their teaching. Instructors avail themselves of these guidelines and resources. As the appropriateness and nature of use will vary according to the discipline and course level, Faculties provide specific guidelines for their instructors.
>
> The leadership responsibility extends to the development of guidelines for use in other contexts such as research and administrative uses. For example, questions related to the use by faculty of generative AI tools for the drafting of teaching portfolios, reference letters for students, and research proposals will need consideration by the appropriate offices.

**Third principle**: **As with all approved learning technologies, instructors have autonomy to decide whether they will use an approved generative AI tool for their teaching and assessments.** The quality of the learning experience is the most important consideration when choosing to use generative AI tools. Potential benefits for instructors are also important considerations if the use of such tools lightens the instructor workload without negatively impacting the student experience.

**Fourth principle**: **Instructors remain responsible for comporting themselves according to the highest standards of academic integrity in their use of generative AI tools.** Instructors maintain responsibility and accountability for all of their instructional materials whether independently created, third-party generated, supported by generative AI tools, or derived from other resources. Instructors must be explicit in course outlines about the expectations for use of generative AI tools and may set limits on their use in assessment tasks.

**Fifth principle: Students remain responsible for maintaining academic rigour. This involves both verifying the accuracy of information generated and acknowledging the use of generative AI tools, if applicable.** Students are responsible for informing themselves about and complying with instructors' explicit expectations and must respect limits established about the use of generative AI tools in assessment tasks.

***Recommendation 2*** **is that the Office of the Provost and Vice-Principal (Academic) (OPVA) provide clear mandates and resources to identified units and groups to develop and implement roadmaps to operationalize the principles.** The Libraries and Teaching and Learning Services (TLS) will be mandated to scale up existing programming and develop new offerings and resources for students and instructors. Other stakeholders will collaborate with the identified units or lead other aspects of the implementation. The allocation of additional resources will be made to ensure timely delivery of the programming.

Specific mandates include:

1. **Education:** The development of an ongoing University-wide education and awareness program. This program will have a variety of offerings and be updated regularly to keep pace with the evolution of the area. Considerations around equity, access, and individual privacy are highlighted in all actions. Members of the McGill community are provided with resources so that they fully understand what the tools do, how they work, and their potential opportunities and challenges. A module along the lines of It Takes All of Us, the Sustainability Module, or the Academic Integrity Tutorial would be an important first step. In parallel, Faculties and programs develop in-depth courses and other resources that are more closely focused on their disciplines. Specifically, instructors will need opportunities and support in learning about generative AI tools in general, with specific consideration of their potential use in teaching, including assessments. Instructors will need to be able to engage in discussions with students about the ethical impacts of generative AI, academic integrity, and where the two overlap. Individual Faculties are encouraged to complement the University programming with discipline-specific offerings.

2. **Pedagogical support**: Instructors will need access to training, additional time, access to tools, and ongoing support so that they may consider and implement appropriate approaches to the use of generative AI tools in their teaching. Uses may be wide ranging--in the articulation of

learning outcomes, the design process, the creation of materials and instructional strategies, or the creation and grading of assessments, including formative feedback. Additionally, those instructors who do not wish generative AI tools used in their assessments will be supported in adapting their assessment practices in consideration of the prevalence of these tools. TLS will construct and maintain a knowledge base of effective ways of using generative AI tools as part of the teaching and learning process. This work will be informed by research on the current knowledge and use of the tools by McGill students and instructors. Once the knowledge base is created, TLS will provide a variety of educational opportunities for instructors including resources, workshops, webinars and learning communities to offer multiple points of support for the instructor community. The University becomes and stays aware of students' and instructors' evolving knowledge of and attitude toward the use of generative AI tools. A preliminary survey undertaken by SSMU indicated that students believe that generative AI will be a constant presence in the future, and it is essential to embrace it and try to incorporate it into teaching to aid student learning (see Appendix III for report). Many students are already using these tools and would like clear guidelines for using generative AI for assignments and study aids, as well as general guidelines on how to properly and efficiently use AI to help their learning. It is also important to outline what would constitute academic dishonesty. By having this information clearly articulated, students would be able to use generative AI tools to their advantage while learning without compromising their respect for academic integrity principles.

3. **Research**: Given this emerging field in higher education, it is of great importance to better understand the pedagogical applications, benefits, and risks of implementing generative AI tools in teaching and learning. The University community should be engaged in building evidence as to how best to adapt to the advent of AI. For this purpose, research projects, interdisciplinary collaborations, quality improvement initiatives, and knowledge dissemination related to AI in higher education should be supported.

## Discussion of educational components

The question of depth and breadth of the educational offerings for the University community will need to be addressed with clear learning outcomes articulated for the mandates. However, as a start, students, instructors, and academic leaders will need to be educated about the factual aspects of generative AI tools and their potential implementation at McGill. Briefly, these are:

- To respect the University's Cloud Directive, all tools must be vetted for student and instructor use. Vetting the specific tools allows the University to ensure that all legal responsibilities are addressed (e.g., intellectual property rights, privacy of information). As with all tools, vetting applies to free software, as well as licensed tools.
- There is not yet a clear research-based understanding of how student use of these tools may impact the development of critical thinking skills. Would the use of generative AI tools enhance critical thinking skills? Could they diminish such skills? What would the impacts be of removing student-generated writing as a task on the development of critical thinking and analytical skills, especially in the humanities and social sciences disciplines? If generative AI is being used, how do we ensure that students are developing those intellectual abilities that are tacitly considered foundational to a university education?

- Using generative AI tools will change the learning activities for students, so consideration should be given to the impact of what is added as well as removed from those activities. The impacts should be assessed on a case-by-case basis, as the specific context (discipline, learning outcomes, etc.) will make generalizations fruitless. What constitutes appropriate instructional use must be discussed to generate norms, likely by discipline and/or department.
- Generative AI technology is not neutral. The normative nature of these tools may restrict original thinking. Depending on the datasets used to generate the output, different biases may be inherent and not explicit. The community must be educated on identifying the biases (political, normative, etc.) and develop strategies to mitigate them.
- This technology is changing rapidly, and constant updating and upgrading of knowledge about how existing tools work and what new tools are available is necessary.

Once students, instructors, and academic leaders are educated about the factual aspects of the nature of generative AI tools and their potential implementation at McGill, a next step is to educate them about the many creative opportunities for enhancing teaching and learning. These include (but are not limited to):

- Creating new types of teaching and assessment strategies,
- Creating personalized student learning experiences,
- Creating instructional materials,
- Providing opportunity for increased diversity and inclusion.

## Conclusion

It is abundantly clear that the arrival of generative AI tools is an inflection point in societal thinking around creativity, intellectual property, academic integrity, and responsibility and accountability for our collective and individual intellectual productions. The University has a responsibility to ensure that all tools used in attaining a McGill education play a positive role and respect the highest ethical principles. McGill should invest in research and capacity building and actively engage in deciding on the roles of generative AI in teaching and learning, research, and administration. It is incumbent on us to provide both education and guidelines to the community as well as guardrails which will create a roadmap for the responsible and positive integration of generative AI tools. The recommendations of the STL AI WG, if adopted, will provide the University community with clear direction for appropriate, thoughtful, and decisive actions in support of the academic mission.

# Appendix I

## Terms of reference – STL AI Working Group

**Mandate and duration**

The STL AI WG will provide recommendations for supporting instructors, students, and academic administrators regarding the appropriate use of AI-generative tools in teaching and learning at McGill. These will include:

- Informing the community about the current capabilities of AI-generative tools.
- Provide guidance on using such tools as part of instructional strategies.
- Provide guidance on using such tools in assessments of student learning.
- A proposed plan of activities for such support, including informational and community building. These may include:
    - Publishing documentation (e.g., Teaching and Learning Knowledge Base articles); blog posts
    - Producing instructional videos.
    - Offering consultations (e.g., review course outlines; design rubrics/rating scales).
        - For individual instructors
        - For departments/units/Faculties.

The STL AI WG will be expected to work until May 2023, with monthly reports to STL at meetings or by email.

**Composition**

The STL AI WG is designed to be a core team that will contribute their own expertise as well as consult with different stakeholders, as appropriate.

Chair: Laura Winer, Chair of STL and Director of TLS
Membership:
Dorian Bandy, Schulich School of Music
Lindsay Holmgren, Desautels Faculty of Management
Jocelyn Maclure, Faculty of Arts
Catherine-Anne Miller, Ingram School of Nursing
Tina Piper, Faculty of Law
Robin Beech, Dean of Students
Sandy Hervieux, Libraries
Carolyn Samuel, Associate Director, Faculty Teaching and Development, TLS
Scott Patterson, Graduate student
Kerry Yang, Undergraduate student
Secretary: Nancy St-Pierre, TLS
Resource person: Adam Finkelstein, Associate Director, Learning Environments, TLS

# Appendix II

## Selected resources

The following list is not intended to be exhaustive or even representative. Rather, members of the Working Group have suggested resources (articles, blogs, videos, etc.) that they found particularly helpful in educating themselves about the tools, framing the discussion, and/or thought-provoking. Note that some may require access through the McGill Library system.

Anselmo, L., Kendon, T., & Moya, B. (2023). *A first response to assessment and ChatGPT in your courses.* Taylor Institute for Teaching and Learning, University of Calgary. https://taylorinstitute.ucalgary.ca/first-response-assessment-and-chatgpt

Chronicle of Higher Education. (2023, May 25). *How will artificial intelligence change higher ed?* https://www.chronicle.com/article/how-will-artificial-intelligence-change-higher-ed?utm_campaign=20230530&utm_content=&utm_medium=Chronicle%20of%20Higher%20Education&utm_source=facebook&fbclid=IwAR3DhzjowyZb58UgHhJ0_LHB0nP1-oWOiejxtHoMpbuqu0oBsRW6StyZyow

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Eaton, S. E. (2023, February 2). *6 Tenets of postplagiarism: Writing in the age of artificial intelligence.* Language, Teaching and Leadership. https://drsaraheaton.wordpress.com/2023/02/25/6-tenets-of-postplagiarism-writing-in-the-age-of-artificial-intelligence/

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Lametti, D. (2022, December 7). *A.I. could be great for college essays.* Future Tense, SlateGroup. https://slate.com/technology/2022/12/chatgpt-college-essay-plagiarism.html

Lametti, D. (2023, January 31). *AI and academia: The end of the essay?* Maple League of Universities. https://www.youtube.com/watch?v=geKsTy8QKhY&ab_channel=MapleLeagueofUniversities

Marche, S. (2022, December 6). *The college essay is dead.* The Atlantic. https://www.theatlantic.com/technology/archive/2022/12/chatgpt-ai-writing-college-student-essays/672371/

McKinsey & Company (2023, January 19). *What is generative AI?* https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-generative-ai

Peters, D. (2023, May 10). *From ChatGPT bans to task forces, universities are rethinking their approach to academic misconduct.* University Affairs. https://www.universityaffairs.ca/news/news-article/from-chatgpt-bans-to-task-forces-universities-are-rethinking-their-approach-to-academic-misconduct/

Rudolph, J., Tan, S., & Tan, S. (2023). *ChatGPT: Bullshit spewer or the end of traditional assessments in higher education? Journal of Applied Learning and Teaching, 6*(1), 1-22. https://journals.sfu.ca/jalt/index.php/jalt/article/view/689

Terry, O.K. (2023, May 12). *I'm a student. You have no idea how much we're using ChatGPT.* The Chronicle of Higher Education. https://www.chronicle.com/article/im-a-student-you-have-no-idea-how-much-were-using-chatgpt?sra=true&cid=gen_sign_in

UNESCO. (2022). *Recommendations on the ethics of artificial intelligence.* https://unesdoc.unesco.org/ark:/48223/pf0000381137

UNESCO. (2023). *ChatGPT and artificial intelligence in higher education, Quick start guide.* https://www.iesalc.unesco.org/wp-content/uploads/2023/04/ChatGPT-and-Artificial-Intelligence-in-higher-education-Quick-Start-guide_EN_FINAL.pdf

U.S. Department of Education, Office of Educational Technology. (2023, May). *Artificial intelligence and the future of teaching and learning: Insights and recommendations.* https://tech.ed.gov/files/2023/05/ai-future-of-teaching-and-learning-report.pdf

# Appendix III

## Report on Student Opinions and Usage Regarding Generative AI

Kerry Yang

Students' Society of McGill University's Vice-President University Affairs

April 2023

### Executive Summary

This report summarizes the finding of a survey conducted from March 6th, 2023, to April 26th, 2023, to gauge student opinions and usage of generative AI technologies such as ChatGPT. This report is intended to shed light on current student usage of generative AI and provide an overall view of the different uses of these rapidly developing technologies at McGill University.

### Context

With the rapid rise in the usage of generative AI, a working group was established to create a framework around its usage in an academic context at McGill. This report seeks to provide the working group with an overview of how students currently use generative AI, and their opinions surrounding its usage.

### Methodology

A survey was created on March 5th, 2023, to ask undergraduate students about their thoughts regarding generative AI. It consisted of 9 questions divided into three sections. The first section was to collect demographic data of the respondents. The second set of questions pertained to usage rates and opinions, while the third section asked for direct examples of generative AI usage. The survey was open from March 6th, 2023, to April 26th, 2023 and was distributed using Student Society of McGill University (SSMU) email blasts to all students, along with email blasts from student-faculty associations, student promotion, and word of mouth.

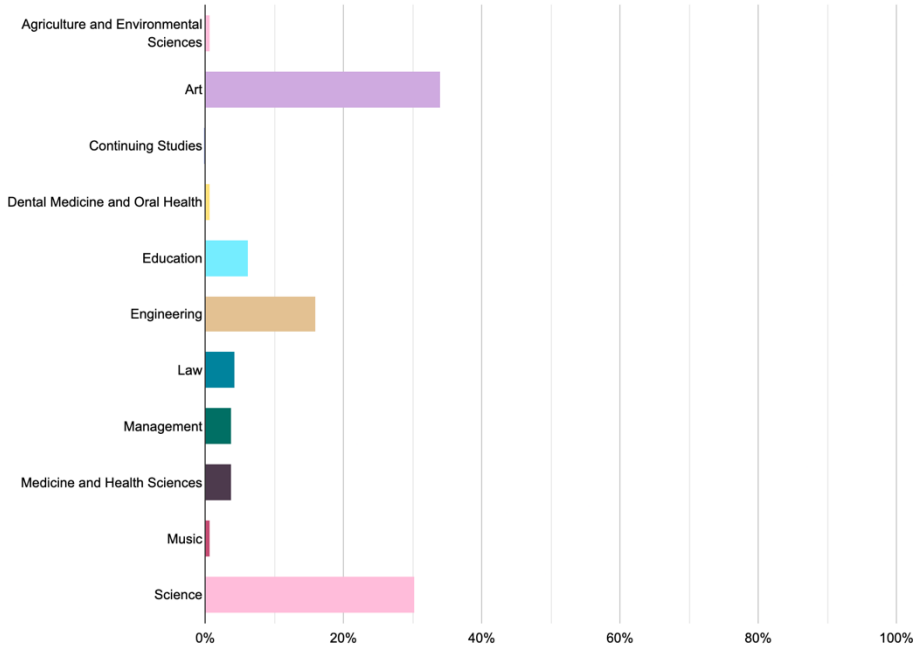
### Results

A total of 162 individuals responded to the survey. 98.1% (n=159) of the respondents were undergraduate students, 1.2% (n=2) were graduate students, and 0.6% (n=1) responded other.

## Respondent Demographics

2. What faculty are you in?

Answered : 162 , Skipped : 0




| Answer Choices | Responses | Count |
|---|---|---|
| Agriculture and Environmental Sciences | 0.6% | 1 |
| Art | 34% | 55 |
| Continuing Studies | 0% | 0 |
| Dental Medicine and Oral Health | 0.6% | 1 |
| Education | 6.2% | 10 |
| Engineering | 16% | 26 |
| Law | 4.3% | 7 |
| Management | 3.7% | 6 |
| Medicine and Health Sciences | 3.7% | 6 |
| Music | 0.6% | 1 |
| Science | 30.2% | 49 |

*Figure 1.1 Students by faculty of the respondents*

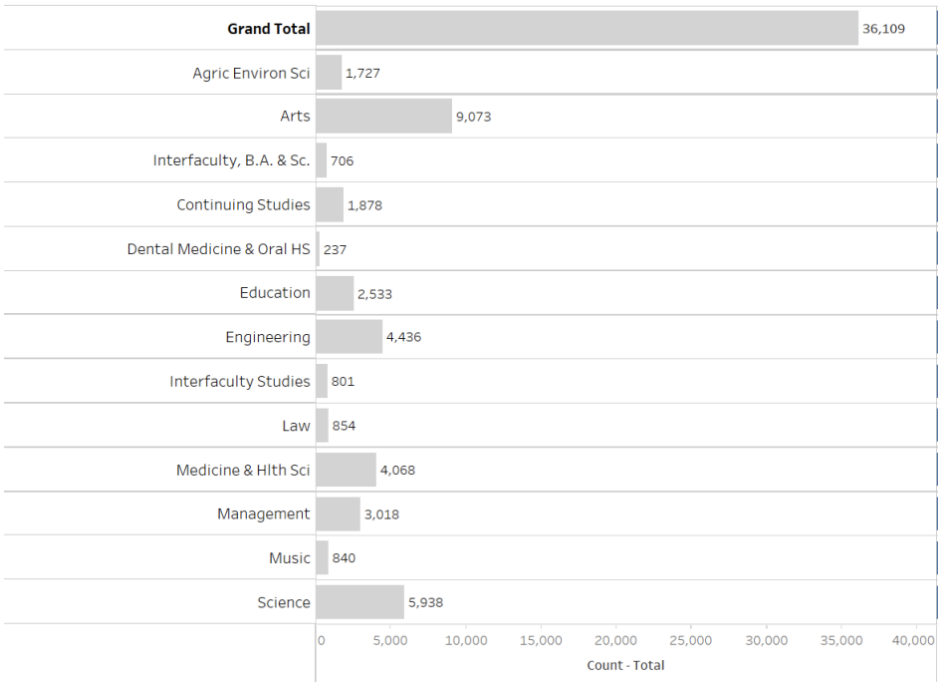
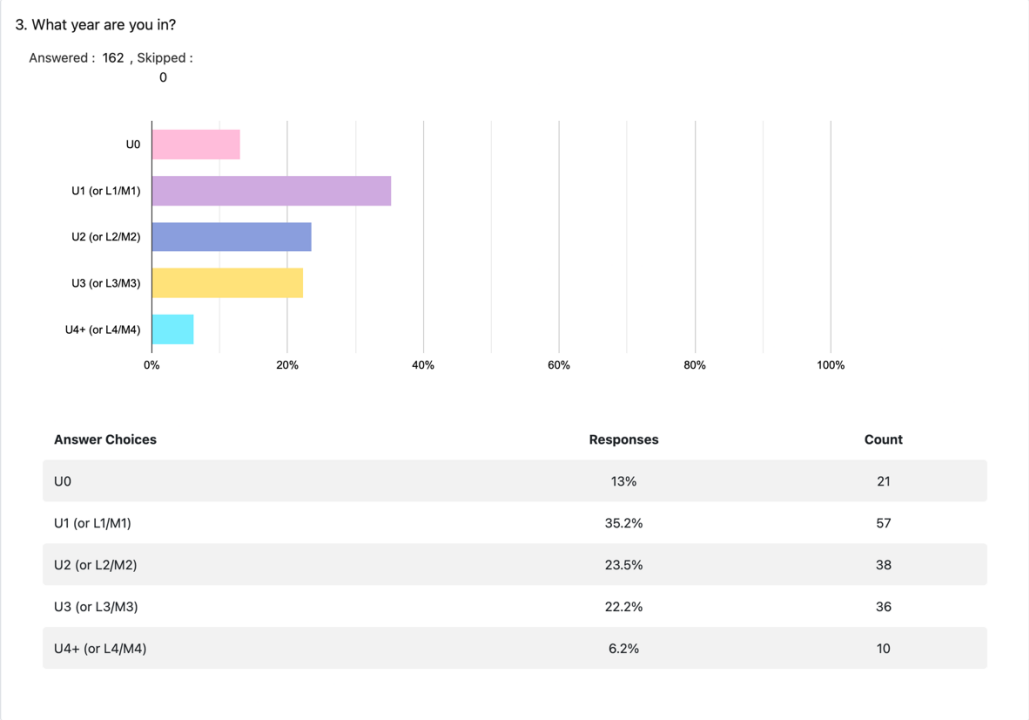



*Figure 1.2 Students by faculty at McGill (taken from the Student Census Report of Biennial Data to Senate – April 2023)*




| Answer Choices | Responses | Count |
|---|---|---|
| U0 | 13% | 21 |
| U1 (or L1/M1) | 35.2% | 57 |
| U2 (or L2/M2) | 23.5% | 38 |
| U3 (or L3/M3) | 22.2% | 36 |
| U4+ (or L4/M4) | 6.2% | 10 |

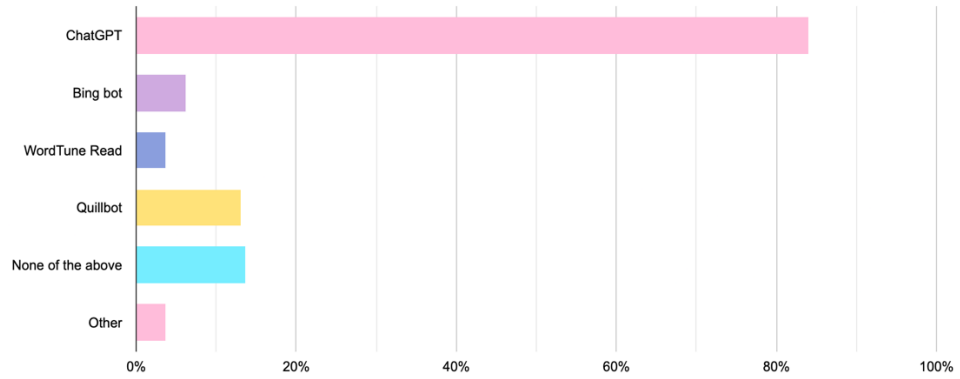
*Figure 1.3 Students by year of the respondents*

Comparing the response to the current student faculty demographics at McGill as of April 2023, there are over- and under-representations of student respondents in the survey data. Science represents 30.2% of respondents, although it represents 16.4% of the student population. Several of the smaller faculties are underrepresented. This has influenced the examples provided by students, which should be noted.

## Generative AI Usage Rates

4. What Generative AI Tool(s) have you used?

Answered : 162 , Skipped : 0




| Answer Choices | % of Respondents | % of Responses | Count |
|---|---|---|---|
| ChatGPT | 84% | 67.7% | 136 |
| Bing bot | 6.2% | 5% | 10 |
| WordTune Read | 3.7% | 3% | 6 |
| Quillbot | 13% | 10.4% | 21 |
| None of the above | 13.6% | 10.9% | 22 |
| Other | 3.7% | 3% | 6 |

*Figure 1.4 Usage rates of different Generative AI technologies*

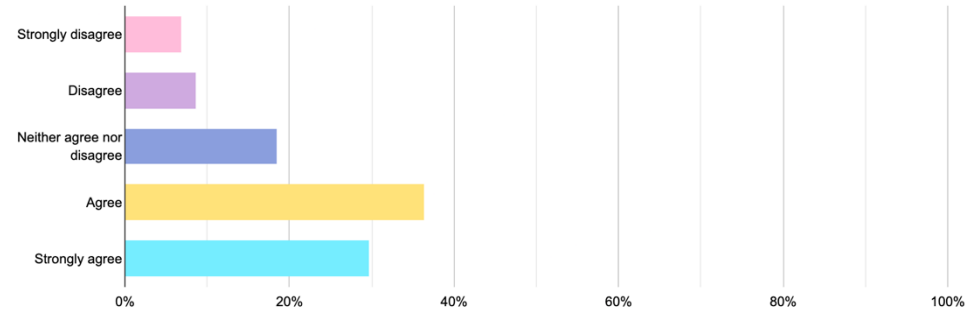
In terms of usage rates by students of the various types of generative AI, the overwhelming majority of students have used ChatGPT (85%). Other generative AI technologies used include Quillbot (13%) and Bing (6.2%), with 13.6% of respondents saying that they have not used any of the technologies as mentioned above. Other technologies that students have used include the OpenAI API, MidJourney, DeepL translate, stable diffusion, GitHub copilot, AOC and Microsoft GODEL.

## Respondent Opinions and Usage of Generative AI

Respondents were asked if they thought generative AI tools had aided their learning. While the majority of respondents believe that generative AI has helped with learning (66.0%), 18.5% of respondents were neutral. In comparison, 15.4% of respondents either disagreed or strongly disagreed with the idea that generative AI has aided their learning.

5. Do you believe Generative AI Tools have aided your learning?

Answered : 162 , Skipped : 0




| Answer Choices | Responses | Count |
|---|---|---|
| Strongly disagree | 6.8% | 11 |
| Disagree | 8.6% | 14 |
| Neither agree nor disagree | 18.5% | 30 |
| Agree | 36.4% | 59 |
| Strongly agree | 29.6% | 48 |

The respondents were then asked to provide specific examples of how they have used generative AI to aid their learning. Of the 162 respondents, 92 answered. Although there was a significant degree of variation, there were some common ways respondents used generative AI for learning.

The most common use for generative AI is to summarize or simplify class material. Many respondents have been asking AI to summarize material from class textbooks, readings, and articles, and to simplify class content in an easily digestible manner. The summaries created by generative AI can help clarify different arguments and concepts of various texts or be used to reword and provide a more precise understanding of course content. It is also quite useful for students who are absent and have very limited information on what was taught in the classes they missed. For students who are short on time, generative AI can help create concise summaries or take out the key themes and messages of readings to help aid comprehension.

Students have used generative AI to help create bullet point notes and flashcards to aid studying and review, along with generalizing course content to develop overviews that help students understand the big picture of a class. Generative AI also helps students with learning disabilities who find it difficult to

read large amounts of text. It helps them keep focus and read the course material in digestible chunks. Students have used generative AI to summarize scientific articles when doing research or writing papers. Another way they used these technologies was to summarize readings in an assignment instead of reading them. After getting the summaries, they picked their favourite article to do their assignment on.

Another widespread use of generative AI is to explain concepts, ideas, and definitions that are complex or hard to grasp. It allows students to get explanations while studying in an easy-to-digest manner, making learning more personalized and efficient. This is particularly useful when readings get technical and use much complex academic jargon, shortening the time needed for a student to grasp an idea and improving retention. Not all instructors are adept at explaining complex topics, and generative AI, like ChatGPT, can help cover gaps in understanding. Generative AI can also improve understanding of different concepts by generating examples or explaining ideas from different perspectives and lenses, including in visual forms, allowing students to have a more holistic understanding. For students who are more introverted and less active in class, AI can aid comprehension, explain assignments, and answer simple questions.

Generative AI has played an important role in helping students approach essays and assignments. They have proven to be useful for students in creating templates or starting points for brainstorming. Generative AL can be used to create prompts or generate ideas and mind maps that can then be used as the basis for writing assignments. Many students need help finding an initial direction or approach to an essay or assignment, and AI is a valuable tool to help them start and bounce ideas. It can streamline thought processes and be used as a search engine to provide ideas quickly and efficiently. It can also suggest academic sources and articles that help with researching for an assignment. It can also provide insight into the links between readings and assignment prompts or suggest academic sources, providing students with a direction to explore further. Its usefulness is wider than just word-based tasks. Students have also used it to provide a starting direction for calculation-based assignments. For respondents who tutor or teach, AI has aided in generating ideas for lesson plans. It has also been a useful tool for those who struggle with executive function and can help organize thoughts clearly and coherently.

Along with brainstorming ideas and creating outlines, generative AI can be used to provide feedback on writing. It can help find areas of improvement, brainstorm new ideas, suggest better vocabulary, and help make more coherent arguments. Many students who have English as a Second Language find the feedback from generative AI particularly useful in the writing process. It greatly aids in their ability to improve their language skills. AI is quite good at changing the writing style to match what the student requires, whether embellishing the writing to make it more academic-sounding or simplifying the text to make it more coherent to the reader. It can be used as a thesaurus to find synonyms, or rewrite sentences so they do not sound repetitive. Students can save time with generative AI for situations when they know what ideas they want write about but are stuck on how to phrase them. It can also help generate summaries and abstracts for reports and papers.

Students who code are also avid users of generative AI. Generative AI can help generate solutions to coding problems, find bugs, and write boilerplate code. A big benefit AI provides is that it can explain errors in detail in an easy-to-understand manner and propose multiple solutions that can be further explored. It can also help students understand snippets of code, teach syntax, and explain coding concepts learned in class to give them a deeper understanding. It can be quick and content-specific and helps students remember and retain the information and skills that they have learned. Generative AI,

such as GitHub copilot and AOC, can also recommend functions and syntax that students can learn more about, promoting active learning compared to more passive forms of knowledge, such as reading code or textbooks. Students have found generative AP to improve recall and comprehension due to its ability to provide suggestions, advice, and real-world examples while coding.

AI has proven to be a very useful tool for active learning. It does an excellent job at creating practice questions with their corresponding solutions. It can take a set of notes and turn them into a quiz that students can go through or scan pdfs and create appropriate exam questions based on the readings assigned in class. Students can use it for active recall and personalize their learning by seeing what concepts they are confused about. Although it struggles to answer more complex questions and has caused students confusion due to its hallucinations, many students like that it can provide solutions. Students strongly prefer practice questions with answer keys so that they can determine whether they are solving problems correctly. Generative AI can provide students with the solutions and feedback they need to enhance their understanding of the material.

Some students enjoy using generative AI to increase their knowledge base and understanding of various topics they are interested in that are outside their fields of study. Generative AI can help break down topics into smaller, more digestible bits, and can also be used to generate stimuli for laboratory research.

The usefulness of generative AI extends beyond the academic realm. Several respondents have mentioned using generative AI to draft emails or build a basic template for cover letters. Some students find cover letter and email writing difficult, so generative AI is useful for improving the written communication abilities of students and can help students save time on these activities. Students have also used it to write reference letters for themselves that professors have asked them to write for them and have also used generative AI to create interview questions for guest speakers during panel events.

Although generative AI has many usages, some respondents have raised concerns about its ability to hallucinate. Some students have tried using generative AI before discovering it provides inaccurate information. Some students found that they had to go back and verify all the information generative AI had told them, causing it to be more time-consuming to use rather than not using it. It has made some students unwilling to use these technologies in the future. When deciding on a framework around generative AI, it is essential that students are provided with proper education and awareness of its potential pitfalls and drawbacks so students know well in advance what to expect when using these technologies.

When respondents were asked about how their friends and classmates used generative AI technologies to aid their learning, 59 responses were received. Many answers were quite like the uses provided by the respondents themselves. Students use generative AI to help explain different concepts in class, improve writing skills, provide summaries of class presentations and notes, and provide feedback on their writing. Respondents also said their friends and classmates found it helpful to reduce the time it takes to make teaching plans, plot and image generation, and connect different readings. Other people have also used generative AI to explain mathematical proofs to them, work on hackathon projects, develop ideas for assignments, and generate responses with different styles to help with brainstorming.

It is also important to note that a significant number of respondents mentioned that their friends and classmates often use generative AI to cheat. Although cheating was not mentioned when respondents

were asked how they used generative AI, cheating was a common response for how friends and classmates used generative AI. Students have used AI to write essays for them, search for assignment solutions - similar to how Chegg is used by students - and write assignment code for introductory computer science classes. Cheating with generative AI is prevalent across most faculties and is an important consideration when deciding on a framework.

Respondents were also asked about how instructors were using generative AI to aid learning. 49 responses were received. Several respondents said that professors were not using it or banning its use in class. Other professors used generative AI to aid student learning. Some instructors have used AI to answer students' questions in class, write formal conclusions about data, and use it to generate code that could be compared to sample code. Several instructors have shown the benefits and drawbacks of generative AI and helped raise awareness around major issues, such as hallucinations.

One instructor that has been receiving strong positive feedback is Professor Andrew Piper. In his BASC 201 course, he has incorporated generative AI into the course. Students were appreciative of the fact that he has explored the uses and the limitations of generative AI. The professor would ask generative AI questions, analyze the response, and then use that as a teaching opportunity. ChatGPT provided definitions and generated examples that taught students about AI and language models. The limitations of generative AI were explored, such as showing that ChatGPT is a poor creative writer. Generative AI was also permitted for the writing assignments in BASC 201. A marking rubric was created, and a guide was created so that students could learn how to cite AI in their writing correctly. Students were very appreciative of the approach Professor Piper took and found his course quite educational.

Respondents were also asked to provide any final thoughts regarding the use of generative AI in an academic setting. A few of the respondents did not support the use of generative AI. They found the negative implications of generative AI, such as privacy, intellectual property, and academic integrity, more significant than the immediate benefits it might bring. There is skepticism around its reliability, and it was raised that there could be significant drawbacks if it replaces critical thinking and creativity. Some students also believe that evaluation mitigation strategies should be used to ensure student learning can still be appropriately tested.

Most respondents believe that the university needs to embrace generative AI. They believe that generative AI will be a constant presence in future, and it is essential to embrace it and try to incorporate it into teaching to aid student learning. Students believe there needs to be clear guidelines for using generative AI for assignments, study aids, and just general guides on how to properly and efficiently use AI to help learning. It is also important to outline what would be permitted (e.g. active learning, writing feedback, explaining concepts) and what would constitute academic dishonesty (e.g. copying material generated, not properly citing). By having this information laid out, students would be able to use generative AI to their advantage while learning.

## Concluding thoughts

Although generative AI has only been widely used for a few months, it is already beginning to completely transform the post-secondary learning environment. Students are finding many different uses of generative AI and discovering the risks posed. Although many students are using it in a manner that is not in line with academic integrity, its potential as a transformative tool for learning has barely been explored. This report can hopefully shed light on the opinions students have regarding generative AI and provide deeper insight into how students are currently using these technologies to aid their learning.