Policies, Procedures, And Guidelines: Are Universities Effectively

Ensuring AI (Academic Integrity) In the Era of Generative AI?

by

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Abstract

The objective of this study was to analyze Generative AI guidelines and policies at Canadian universities, examining how these universities are ensuring academic integrity in the face of challenges posed by using Generative AI tools in academic work. Focusing on assessment redesign, AI-content citation, and AI-detection, the study employed qualitative document analysis of policies and guidelines from the top twenty Canadian universities according to Times Higher Education World Rankings. This purposive sampling strategy, focused on leading institutions from different provinces, aimed to provide a representative overview of best practices and emerging trends in Generative AI policy and guideline development. The analysis revealed both commonalities and differences in institutional approaches. While universities generally emphasize transparency through documentation, updated academic integrity policies, and instructor autonomy in AI use, they differ in their approaches to AI detection tools, as well as AI acknowledgment and citation. These results show Canadian universities' varied strategies to address the complexities of Generative AI in academic environments. The study identifies key recommendations for instructors, students, researchers, and staff, offering a foundation for developing comprehensive Generative AI guidelines at the university level.

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Chapter 1: Introduction

The term 'Generative AI' has become ubiquitous since the launch of ChatGPT, and the implications of its use in the academic sphere (e.g., for writing assignments and research papers), have taken considerable space in intellectual discussions and debates (Crawford, 2023). Universities, instructors, and policymakers are learning to leverage the possibilities of Generative AI technologies while gearing up to confront the emerging problems; the threat to academic integrity is a major one (Chan, 2023).

According to a UNESCO survey, less than ten percent of schools and universities have formal guidance on adopting Generative AI in the teaching and learning continuum (UNESCO, 2023b). Moreover, Plata et al. (2023) stated:

> By creating explicit rules, [Higher Education Institutions] HEIs can encourage accountability and openness when students use AI technologies. Additionally, having customized regulations will help HEIs adjust to their academic contexts' unique requirements and features. This adaptability enables institutions to use Generative AI's advantages while resolving any potential difficulties or worries particular to their educational contexts. (p. 753)

There is an imbalance between punitive and educative approaches to academic integrity, with many universities needing clear statements of institutional responsibility for upholding academic integrity standards (Perkins & Row, 2023). These institutional statements to deal with the issue of academic integrity can be framed and accommodated within the framework of either policies, procedures, or guidelines. Freeman (2013) presented a table (see Table 1) to define policy, procedure, and guidelines in a university context. He established that procedures and guidelines are subordinate institution-specific policy instruments to complement the canopy of policies.

Table 1

Definitions – Policy, Procedure, and Guideline

Policy	A policy is a statement of principle that articulates and aligns with legislative, regulatory, or organizational requirements.
Procedure	A procedure is a statement that provides information or step-by-step instructions to implement a policy.
Guideline	A Guideline is a statement that guides to support the implementation of and ongoing compliance with a Policy or Procedure.

Source: University of Melbourne, *Policy on Policy* (version approved by Council 29 April 2013), n.p.

There should be more engagement among all the stakeholders (students, professors, and universities) in academia to lay clear-cut guidelines and policies on when and how these technologies can be used constructively (Dwivedi et al., 2023). Rudolph et al. (2023) further suggested that the HEIs "develop policies and clear, easy-to-understand guidelines for the use of language models in learning and teaching - the guidelines should include information on the proper use of these tools and the consequence of cheating" (p. 15). Crawford et al. (2023) also considered it crucial for educational institutions to establish comprehensive guidelines outlining the acceptable use of AI-generated content and to emphasize the importance of attribution and academic integrity.

Although HEIs were initially unprepared for the development of Generative Artificial Intelligence [GAI], an increasing number of them have begun to develop guidelines about their use in teaching, learning, and assessment (Sullivan et al., 2023). In the aftermath of the first semester of AI usage in academic writing, several universities have revamped their educational integrity policies to plug any loopholes that may have existed before this new era (Qadir, 2023). There can be much to learn from different HEIs' responses to GAI, allowing for a collective

shaping of clear and consistent guidelines regarding GAI, academic integrity, and assessments (Moorhouse et al., 2023).

Chapter 2: Literature Review

This review traces the development trajectory of Generative AI tools from deep learning and how deep learning has evolved from a sub-field of Artificial Intelligence called Machine Learning. While searching for the potential uses and limitations of this new technology in education, this literature review brings to the fore the impact of this AI-driven large language model on academic integrity and Plagiarism. This literature review also illustrates the efficacy of AI detection tools in differentiating AI-generated content from human-generated content.

Definition and Evolution of Artificial Intelligence

AI systems are designed to achieve goals even when processing particularly complex information. The AI systems use methods similar to the problem-solving methods used by humans (McCarthy, 1988). The High-Level Expert Group on Artificial Intelligence (AI HLEG) of the European Commission (EC) (2018) defined Artificial Intelligence as "systems that display intelligent behaviour by analyzing their environment and taking actions – with some degree of autonomy – to achieve specific goals" (p.1). On the other hand, Agrawal, Gans, and Goldfarb (2022) said that modern technology does not bring us intelligence, only one of its components, predictions, so they use the term 'prediction machines' instead of artificial intelligence.

AI has gone through many peaks and troughs since its early inception in the 1950s, called AI "summers and winters" (Russell & Norvig, 2020). Since 2010, however, AI can be said to have once again entered a summer period, mainly due to considerable improvements in the computing power of computers and access to massive amounts of data (Anand & Verweij, 2019).

Machine Learning

The expansion in artificial intelligence has been driven mainly by applying machine learning as part of the neural network approach and by developing deep learning within machine learning (Taye, 2023). Furthermore, Taye (2023) explained:

> If artificial intelligence is like a brain, then machine learning is how AI gains new cognitive abilities. Deep learning is the most effective self-training system now available. Machine learning is the study of making computers learn and improve in ways that mimic or outperform human learning ability, and the entire discipline of artificial intelligence, known as machine learning, is founded on this principle of learning by example, of which deep learning is a subset. (p. 2)

Machine Learning has implications in the academic field, as students, instructors, and administrators can increasingly rely on it in their learning, teaching, and administrative tasks. Deep Learning is a subfield of machine learning that has contributed to the rapid development of Generative AI.

Deep Learning: A Subset of Machine Learning

Deep learning is a branch of machine learning that aims to develop a model that matches the level of the human brain in solving complex problems in the real world by utilizing artificial neural networks and simulation learning (Taye, 2023; Yu et al., 2023). Lynch (2020) further explained that deep learning is a subset of machine learning (see Figure 1) that uses neural networks with multiple layers of processing nodes to analyze various data factors for complex pattern recognition and prediction. Deep learning differs from traditional machine learning and data mining because it can generate very detailed representations of data from massive datasets (Taye, 2023).

Figure 1

Lynch's (2020) Venn diagram Depicting the Link Between Artificial Intelligence, Machine Learning, and Deep Learning
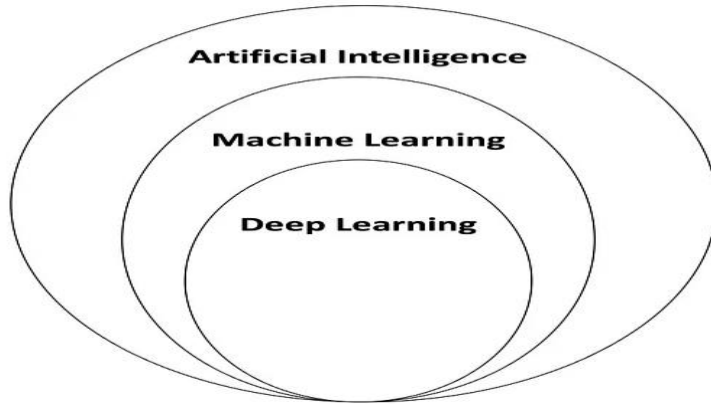
The growth in deep learning has paved the way for the development of Generative AI tools that have huge potential for use in the higher education sector.

Generative Artificial Intelligence

Generative AI models use advanced deep learning and transfer learning algorithms and machine learning techniques to learn patterns and relationships from the existing data and generate new content similar to human-created content in style, tone, or structure. (Yu et al., 2023). Furthermore, Farrelly and Baker (2023) defined Generative AI as a class of artificial intelligence systems designed to generate content or data, such as text, images, video, music, computer code, or even complex combinations of these media, that closely resemble human-created content. A comprehensive definition by Lim et al. (2023) described Generative AI as a technology that (i) leverages deep learning models to (ii) generate human-like content (e.g., images, words) in response to (iii) complex and varied prompts (e.g., languages, instructions, questions).

Generative Pre-trained Transformer (GPT) models of Generative Artificial Intelligence, which underlie popular tools like ChatGPT, are based on the use of publicly available digital content data to read and produce human-like text in several languages (natural language processing) and can exhibit creativity in writing (Baidoo & Owusu, 2023). Modern developments in natural language processing have paved the way for creating complex large language models like the Generative Pre-trained Transformer (GPT) family. For various applications, including chatbots and content production, GPT models have demonstrated an exceptional ability to produce coherent and contextually suitable text (Dalalah & Dalalah, 2023). This technology has led to the emergence of some popular Generative AI tools like ChatGPT, Gemini (previously Bard), Midjourney and so forth.

ChatGPT and Other Generative AI Tools

In late 2022, ChatGPT and other large language models rapidly entered the mainstream vernacular. Developed by OpenAI, ChatGPT, which stands for Chat Generative Pre-Trained Transformer, was the most prominent development in large language models [LLMs] created by software companies like OpenAI and others (Birks & Clare, 2023).

Since its launch, ChatGPT has garnered a user base of more than 150 million, and this rise in its use points to the enormous implications Generative AI will have in all spheres of human activities, including the education sector (Hu, 2023). This AI-based conversational tool can simulate a human conversation and improve over time by learning from its user interactions. It creates convincing essays and research papers, so a large segment of its user base is from the education sector in the form of the student community that is using this AI tool in their academic work like research, clarification of concepts, learning new skills, summarization, or writing papers (Sullivan et al., 2023). Apart from ChatGPT, there are numerous other Generative AI tools like

Chatsonic, Stable Diffusion, DALL-E, CactusAI, NotionAI, BERT, Bing, ClickAI, Jasper, Wartune, Writesonic, Midjourney, Bard and Llama (Farrelly & Baker, 2023) with a broad scope of application in the academic life.

Lim et al. (2023) stated these tools deal with texts and input-output that might range from a comprehensive data set like texts, images, PDFs, and other formats. The ChatGPT model is trained on diverse data sources, including articles, books, and websites, to ensure its access to a broad spectrum of language styles and topics (Kim et al., 2023). ChatGPT uses unsupervised pre-training and fine-tuning to generate human-like responses to queries and provide answers to topics that resemble a human expert (Dwivedi et al., 2023). The data used in ChatGPT is carefully curated to exclude low-quality and redundant information (Mijwil et al., 2023). Their abilities to generate new content based on given instructions and solve the given problems make Generative AI a potential opportunity and a matter of concern (Crawford et al., 2023).

Opportunities of Generative AI Use in Education

Cotton et al. (2023) stated that ChatGPT is an AI tool that offers a range of benefits, including increased student engagement, collaboration, and accessibility. In the education and research field, ChatGPT can help students, academics, and researchers at all levels with their research, including finding sources of information and assisting with literature reviews, data analysis, and manuscript preparation. It can advise enhancing a researcher's present work to take it to a finished product ready for publication (Dalalah & Dalalah, 2023).

ChatGPT and other language models can alter how academics conduct research and teach. These resources can spark original thought, offer context, and aid with critical analysis (Dalalah & Dalalah, 2023). ChatGPT can enhance the productivity of knowledge work through various mechanisms, such as simplifying the information search process. Still, the prediction is that its

most significant impact will be to provide a competent first draft for our most common written knowledge tasks (Dwivedi et al., 2023).

ChatGPT can be a writing collaborator who can assist you with generating words. This intellectual sparring partner can engage with you in stimulating discussions, be a dedicated research assistant who can quickly access information and conversationally fulfill your requests and be an administrative assistant to help draft reports (Atlas, 2023). Moreover, ChatGPT, or a natural language processing (NLP) model like it, can provide a virtual intelligent tutoring service where students can ask questions and receive personalized responses and feedback (Qadir, 2023).

Advancements in AI technology can improve efficiency, save time, and enhance productivity across a broad spectrum of tasks and activities, including education (Mijwil et al., 2023). Farrokhnia et al. (2023) also noted that Generative AI can increase access to information, facilitate personalized and complex learning, and decrease teaching workload, making key processes and tasks more efficient.

Scholars acknowledge the potential positive changes Generative AI technology can bring to the academic sphere. According to Lo (2023), this technology has the potential to revolutionize various activities in educational settings, such as searching for information, answering specific questions, enquiring about any topic, engaging in open conversations and discussions, writing and editing reports and essays, generating software codes; providing tutoring by explaining codes; providing samples of data for databases and analysis; and solving mathematical calculations and statistical analysis, as well as translating texts to other languages. Halaweh (2023) stated that Generative AI can generate ideas around one topic, familiarize one with the aspects and issues of a topic or problem, or generate possible codes for application programs. Still, produced texts should be considered something other than someone's final output. Reverse searching should be

used to find more about the issues and ideas found and cite them properly. Also, individuals can use these tools to paraphrase texts, check English writing, and provide suggestions for improvement.

Uzun (2023) mentioned that ChatGPT could be used to create chatbots or virtual assistants that challenge students to solve problems or answer questions through natural language interaction. Wang et al. (2024) added that universities can leverage Generative AI tools like ChatGPT to enhance educational experiences by using AI to generate interactive quizzes, writing prompts, grading rubrics, lesson plans, and educational materials. Scholars can use Generative AI tools for tasks such as writing reports, creating presentations, and summarizing large amounts of data (Lo, 2023). One potential opportunity for ChatGPT and other such tools in higher education is the creation of personalized assessments (Cotton et al., 2023). Furthermore, Luo (2024) added that by reevaluating the concept of originality and embracing the use of generative AI as a tool for learning and collaboration, universities can foster a culture of innovation and creativity among students. Besides the opportunities these tools present, there are concerns with using Generative AI in education.

Limitations of Generative AI in Education

Generative AI has overtaken the world, with notable educational tension (Lim et al., 2023). According to Qadir (2023), education has several potential pitfalls regarding the student use and abuse of ChatGPT and other artificial intelligence (AI) tools, such as plagiarism, overreliance, misinformation, and privacy concerns. Veletsianos (2023) noted that the rapid emergence of AI in education, combined with a general lack of understanding of the tool and its implications, has led to varying levels of concern and uncertainty across post-secondary institutions. Atlas (2023) mentioned several problems associated with using ChatGPT, stemming from its AI-based nature

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on one hand and its use in education specifically on the other hand; these include potential bias and discrimination due to its reliance on natural language processing; privacy concerns as search and query data may be saved and used for unintended purposes; worries about job loss (substituting instructors and academic writers), the lack of creativity and critical thinking, as well as inaccuracies and plagiarism. Foltynek et al. (2023) remarked that existing terms like plagiarism did not accurately include this type of academic misconduct, and they recommended using an umbrella definition for all types of unauthorised content generation, which means the production of academic work using unapproved or undeclared human or technological assistance.

According to Lo (2023), Generative AI also presents issues, such as generating incorrect or fake information and student plagiarism. Cotton et al. (2023) pointed out that ChatGPT and other tools raise challenges and concerns, particularly academic honesty, and plagiarism. With the emergence of ChatGPT, many problems have arisen regarding online assessment security and cheating in online exams. As these tools become more widespread and accessible, they potentially increase misrepresentation and academic malpractice opportunities. Some students may use these tools to generate essays, research papers, or other academic assignments without proper attribution, undermining the educational value of these tasks and the credibility of academic institutions (Perkins, 2023). Shiri (2023) also stated that ChatGPT threatens to erode academic integrity by enabling students to generate essays without thinking through the topic or translating their thoughts into words. There is a significant risk of research fabrication with the research abilities of GPT (Mijwil et al., 2023). GPT can compose an essay of hundreds of words in less than one minute, written at professional researcher quality. An article could easily be written entirely by GPT by breaking the main topic into subtopics and then having GPT write each section (Lund et al., 2023).

Cotton et al. (2023) questioned the ability of chatbots to conduct original research. Mijwil et al. (2023) highlighted other intellectual property issues and production originality.

One of the other main challenges is the potential for ChatGPT and other language models to perpetuate societal biases and discrimination. Substantial amounts of data train these language models; if that data is biased, the model will reflect that bias in its output (Dwivedi et al., 2023). ChatGPT and related technologies have the potential to impact academia, scholarly research, and publishing significantly. There is a risk of algorithm bias that can be inadvertently perpetuated when these models based on biased datasets are used to generate academic research, leading to the dissemination of hidden prejudice (Lund et al., 2023).

Another limitation is understanding human emotions, intentions, and moral reasoning. ChatGPT and other language models cannot understand human emotions, intentions, or moral reasoning, which is a limitation when using them for tasks that require empathy, such as providing counselling or tutoring (Atlas, 2023). Cao and Dede (2023) also added that while these AI technologies offer advantages such as accessibility, scalability, personalization, and non-judgmental interactions, an intrinsic lack of contextual and experiential knowledge, comprehension, and ways to teach implicit skills and dispositions limits their teaching ability.

There is also a threat of a decline in the critical thinking abilities of future-generation students due to excessive Generative AI use in Education. Farrokhnia et al. (2023) warned that the threats to education due to this technology include a lack of understanding of the context, threatening academic integrity, perpetuating discrimination in education, democratizing plagiarism, and declining high-order cognitive skills. Mijwil et al. (2023) agreed with Farrokhnia et al. (2023) in establishing that increasing the use of Generative AI would negatively impact future generations' ability to evaluate information critically. The capability of AI in creating essays,

creative texts, and content, among others, opens the gates to discussions about plagiarism, attribution, and the accuracy of the information, not to mention the possibility of decreasing students' critical thinking skills (Plata et al., 2023). This is because the use of Generative AI can simplify the process of obtaining answers or information, negatively impacting the students' motivation to perform independent research and arrive at their conclusions or solutions (Cotton et al., 2023).

ChatGPT has raised various ethical issues, such as encouraging plagiarism and cheating and being prone to errors such as the provision of fake information and a decline in their higher-order cognitive skills such as creativity, critical thinking, reasoning, and problem-solving (Tlili et al., 2023). In this way, ChatGPT and related technologies have the potential to impact academia, scholarly research, and publishing significantly. It is essential to carefully consider the ethical implications of these technologies (Lund et al., 2023). Therefore, immediate action is needed to address these potential issues and optimize using ChatGPT and other AI tools in education. One strategy to deal with AI-generated text is to use AI-detection tools, but there are increasing doubts over the efficacy of such AI detectors.

Efficacy of AI-Detection Tools

The development of tools to detect AI-generated content has become an urgent need in many fields (Uzun, 2023). The limited availability of technologies that can detect such violations poses a significant challenge to academic writing (Mijwil et al., 2023). Educators and publishers can use detection software like Chatzero or ChatGPT checker to check the authenticity of the research work (Shiri, 2023). Several tools and techniques can be used to detect AI-generated content, like stylometry, metadata analysis, and online AI detectors. In contrast, these tools and techniques help detect AI-generated content but also have limitations (Shiri, 2023). For example,

online tools may only sometimes be accurate, and content generated by new or less well-known AI models cannot be seen (Uzun, 2023).

As AI becomes increasingly proficient at imitating human-like text, traditional plagiarism-detection tools are rendered ineffective because AI-generated text deemed original is undetectable (Dwivedi et al., 2023). The performance of AI-detection tools becomes only marginally better than a random classifier (Feizi & Huang, 2023). Moreover, the existing AI detection tools are prone to false positives and negatives due to variable human writing styles (Dalalah & Dalalah, 2023). Additionally, there are reports of bias against non-native English writers due to the design of the detection tools, which looks for low perplexity writing as a marker for AI-generated text and penalizes non-native speakers with limited linguistic impressions (Liang et al., 2023). This study by Liang et al. (2023) also found that changing the prompting strategy can bypass the detection tools.

Even with potentially feasible solutions, such as credible AI detection tools and watermarking AI-generated output, students may also opt to edit the AI-generated works or use other means like paraphrasing to make the results less identifiable as machine-generated (Lancaster, 2023). Farrelly and Baker (2023) mentioned that OpenAI, the company behind ChatGPT, created a tool in January 2023 to detect content created by their model. Still, it is skeptical of its capability to detect AI-generated writing reliably. Still, the company warned early on that the nature of Generative AI was such that it would be impossible to see AI-generated writing reliably. Apart from using AI detectors, there can be policies and pedagogical approaches to ensure the ethical use of Generative AI in education.

Ethical Use of Generative AI in Education

The integration of Generative AI into academic institutions can only occur through comprehensive institutional policies. Clark et al. (2012) highlighted the importance of institutional policy:

> Institutional policies are vital to the well-being of institutions of higher education. They promote legal and regulatory compliance, are the primary means of informing the faculty, staff, and students of rights, responsibilities, and procedures, are a standard by which institutions are judged in litigation and can be an important facet of shared governance. (p. 12)

Perkins (2023) asserted that institutions must carefully consider how to create policies dealing with students' legitimate use of Generative AI software to support their education. It is not only the development of policies that can promote the ethical use of Generative AI, but there is a strong need to communicate these policies to different stakeholders. Perkins and Roe (2023) further suggested that communicating policies and guidelines to students regarding using AI models in academic work can go a long way in ensuring academic integrity at the institutional level.

These policies must be nuanced when dealing with complex Generative AI technologies. Perkins and Roe (2023) stated that ongoing transformations and complexities introduced by technological threats such as Generative AI tools require an even more proactive and informed approach to uphold academic integrity in the face of evolving challenges. According to Chan (2023), it is essential to develop clear and consistent guidelines and policies for referencing AI-generated content to ensure that researchers and students can provide proper attribution and credit for the sources they use in their work. A notable research gap remains regarding a broader

understanding of how to redevelop academic integrity policies considering new challenges brought about by technological developments (Perkins & Roe, 2023).

Apart from comprehensive institutional policies, curriculum designs must be modified to be compatible with the technological evolution of Generative AI. Bretag et al. (2018) urged universities to develop teaching and learning environments that nurture solid student-teacher relationships and reduce opportunities to cheat through curriculum and assessment design. Atlas (2023) and Wang et al. (2024) also emphasized the need to review and update examination policies, curriculum design, and teaching methodology due to the rising use of Generative AI tools.

Some scholars are skeptical about the liberal use of these emerging AI technologies in educational settings. Atlas (2023) cautioned that while ChatGPT can be a valuable tool for brainstorming and writing help, professional communications, and individualized learning, it is crucial to understand its capabilities and limitations. Wang et al. (2024) indicated the limitations in the form of the risk of increased plagiarism and questions about authenticity. Dalalah and Dalalah (2023) also showed their concern by arguing that for research contributions to be appropriately recognized and highlighted, it is crucial to employ these techniques deliberately but carefully.

The role of teachers in HEIs will also change drastically, necessitating a change in their pedagogical approach. The increased use of AI tools may change the role of instructors, leading to a shift from traditional lecturing to more interactive and collaborative learning experiences. It is important to note that the impact of AI on university education will depend on how these tools are implemented and used (Qadir, 2023). Qadir further added that it is essential for universities to carefully consider the potential benefits and drawbacks of incorporating Generative AI into their teaching and assessment practices.

The definition of plagiarism and the acceptable and non-acceptable use of generative AI tools will evolve as they become more prevalent, and alternative assessment methods, such as oral exams or projects, may become more popular to mitigate these risks (Qadir, 2023). There is a need to encourage critical thinking, originality, and proper citation practices (Halaweh, 2023). Ultimately, promoting awareness, providing guidance, and fostering a culture of academic integrity can help mitigate the potential negative impact of AI language models on academic integrity (Tlili, 2023).

Though there are concerns about plagiarism and the replacement of human jobs, a more productive way forward is for educators to focus on demystifying AI, emphasizing the learning process over the final product, honouring learner agency, orchestrating multiple sources of motivation, cultivating skills that AI cannot easily replicate, and fostering intelligence augmentation (IA) by building human-AI partnerships (Cao & Dede, 2023). The recent emergence of ChatGPT has led to multiple considerations and discussions regarding the ethics and usage of AI; in particular, the potential exploitation in the educational realm and future-proofing curriculum for the inevitable wave of AI-assisted assignments must be considered (Anders, 2023).

Chapter 3: Methodology

Knowledge Gaps and Research Questions

This study is in line with this emerging need to analyze institutional policies to deal with the issues of plagiarism and academic integrity in the era of Generative AI. The findings help us to understand the problems brought about by using Artificial Intelligence tools in academic life and the mechanisms universities have devised to deal with these issues. Therefore, the purpose of this research was to study the strategies employed by these institutions in managing Generative AI advancements, including the recommendations made for instructors on redesigning assessments, the stance on the use of AI detection tools, and the guidelines for acknowledging and citing Generative AI tools in academic work. By examining these aspects, the study seeks to contribute to a comprehensive understanding of how universities are navigating the complexities of Generative AI while upholding academic integrity and fostering effective educational practices.

A significant knowledge gap regarding how universities deal with Generative AI lies in the lack of comprehensive understanding of the specific strategies and policies that institutions are implementing to address the challenges posed by GenAI technologies (Perkins & Roe, 2023). While some universities have begun to establish guidelines, there is insufficient empirical research on these policies and their consistency across different institutions. This gap is important to research because as GenAI technologies evolve and integrate into academic environments, universities must ensure their academic integrity policies effectively mitigate risks such as plagiarism and bias and leverage the GenAI technologies for potential benefits in education. Understanding current institutional approaches can inform best practices, while also contributing to the broader discourse on ethical AI use in education. Therefore, I propose the following research question:

RQ1: How are universities in Canada dealing with Generative AI advancements through their Generative AI policies or guidelines?

A knowledge gap exists regarding the specific recommendations universities provide to instructors for redesigning assessments considering Generative AI. Researching this gap is crucial because effective assessment redesign is essential for maintaining academic integrity and ensuring that learning objectives are met in an era where GenAI can easily generate content. Therefore, I propose the following research question:

RQ2: What recommendations do universities make for instructors regarding redesigning assessment in the face of Generative AI use?

A knowledge gap exists concerning the recommendations universities make for instructors regarding the use of AI detection tools to identify AI-generated content. While some institutions may have guidelines, there is insufficient information on the consensus among universities about the effectiveness, reliability, and ethical implications of these tools. Researching this gap is important because the use of AI detection tools raises critical questions about academic integrity, privacy, and the potential for misidentification of student work. Understanding the recommendations can help clarify best practices for instructors, ensuring they are equipped to make informed decisions about using these tools. Therefore, I propose the following research question:

RQ3: Do universities recommend that instructors use AI detection tools in their Generative AI policies or guidelines? If not, why?

A knowledge gap also exists regarding the specific recommendations universities provide to students on using Generative AI in academic work. While some guidelines may exist, there is limited understanding of their consistency and effectiveness across institutions. Researching this

gap is crucial because students require clear guidance to use AI tools responsibly and ethically. Identifying these recommendations can help promote academic integrity and critical thinking, while also informing the development of resources that empower students in an AI-driven educational landscape. Therefore, I propose the following research question:

RQ4: How do universities recommend that students utilize Generative AI tools in assignments and research works?

Researcher Background

I landed in Thunder Bay on 19th January 2023 amid the snowy weather and stayed at my friend's place for a few days. The next day, she took me to the Lakehead University Campus to attend Lakehead's Academic Integrity Module workshop. In that session, I first learned about Academic Integrity and Plagiarism. We followed the instructions, completed the Academic Integrity Module, and received our certificates online. Completing the Academic Integrity Module was one of the requirements for the two courses we had undertaken. As I began to take the classes, there were more and more discussions on the importance of citing and referencing in research papers. I observed instructors taking extra care to ensure students were genuinely finishing their assignments by cross-questioning students and seeking personalized feedback. This assignment shift coincided with the emergence of a Generative AI tool, ChatGPT.

I spoke with other students from various departments on how ChatGPT could complete coding and essay assignments in minutes. I experimented with it myself and got good answers to my queries. From initial warnings in the classroom against its use in the assignments to my newsfeed being full of ChatGPT and Artificial Intelligence, I was drawn to study this topic in depth in one of my courses. I started examining the literature on the impact of Generative AI on Academic Integrity and narrowed my focus down to Lakehead University. I tried to search for

Lakehead University's policy on Artificial Intelligence. With further research, I learned that the policy was still being framed but that some basic guidelines on Generative AI are available on the university's website. After reading these basic guidelines, I became curious to learn about other universities' policies, procedures, and guidelines to understand their progress better and accommodate the exceptional improvement in the capacity to plagiarize with Generative AI technology use.

I found that many universities and colleges across Canada have formed task forces (consisting of their faculty, students, and administrators) on Generative AI. Additionally, many universities have updated their policies and developed guidelines for using Generative Artificial Intelligence in academic work. These policies and procedures are easily accessible through their websites.

My initial analysis found that most university policies and guidelines do not categorically prohibit using Generative AI tools. Rather than shunning the use, educational institutions devised guidelines to encourage the ethical use of these Generative AI tools in furthering educational goals. They gave the instructors the liberty to frame their syllabi as they chose to ensure the maximum achievement of the intended learning outcomes.

I looked for resources that analyze these policies' content, but few options were available. I was interested in digging deeper into the policy implications of the rising use of Generative AI in the academic field. I analyzed the policies, procedures, and guidelines of universities across Canada to understand their approach to ensuring educational integrity in the era of Generative AI. As Dwivedi et al. (2023) remarked, it is critical to identify and implement effective policies to protect against misuse and abuse of Generative AI in academia.

Philosophical Approach

Constructivism is a viewpoint that sees meaningful human reality not as an objective truth waiting to be discovered but as something created by individuals through their interactions with the world and their interpretations of one another (Crotty, 1998). Constructivism serves as an epistemological foundation for this research by framing knowledge as a dynamic and context-dependent construct, shaped through social interactions and individual experiences. This perspective is particularly relevant when exploring how universities formulate recommendations regarding the use of Generative AI in academic settings. By analyzing diverse university policies and recommendations, the research can uncover how different institutional cultures and environments shape the understanding and use of Generative AI.

Research Design

Glaser and Strauss (1967) argued that documents, like an anthropologist's informant or a sociologist's interviewee, should be considered in social investigation. Although often neglected in methodological research, unobtrusive research methods, such as document analysis, are increasingly recognized as exciting and innovative strategies for collecting and assessing data (Berg, 2001).

As a qualitative method, document analysis is a systematic procedure for reviewing and evaluating documents that entail finding, selecting, appraising (making sense of), and synthesizing data contained within them (Bowen, 2009). I have used qualitative document analysis as a tool to analyze the Generative AI guidelines and policies of 20 selected universities across Canada. Altheide (1996) states that qualitative document analysis privileges the researcher's part in the study by employing a continuous comparative method of finding text themes, patterns, and

meanings. Morgan (2022) lists some strengths and limitations (see Table 2) of using document analysis as a method of qualitative research study.

Table 2

Morgan's (2022) Listing of the Strengths and Limitations of Conducting a Document Analysis

Strengths	Limitations
Fewer ethical concerns to deal with	Limited information
Unobtrusive form of research	Fewer opportunities to check for bias
Cost-effective method	Not enough data to complete a study that matches the researcher's interests
More opportunities to do research that would otherwise be difficult to do	

Considering Morgan's strengths and the timeliness this method ensures in analyzing the most recent policies or updates to existing policies, document analysis was the most suitable method for this research.

Document Selection

The document analysis in the study aimed to explore how Canadian universities address academic integrity issues related to Generative AI tools. The chosen documents were valuable data sources due to their detailed coverage of institutional policies, guidelines, and recommendations concerning academic integrity and AI technologies. Documents offered a structured and comprehensive insight into universities' strategies for managing academic integrity in the context of evolving technologies like Generative AI. I employed a purposive sampling strategy to select documents from the top twenty Canadian universities as per the Times Higher Education World University Ranking 2024 (Best Universities in Canada, 2023). I utilized Times Higher Education

(THE) rankings due to their reputation and credibility as a leading source for global university evaluations. THE's rigorous methodology assesses institutions across five key categories: Teaching, Research, Citations (research impact), International Outlook, and Industry Income, using a combination of 13 performance indicators to evaluate a university's overall performance in research, teaching, and knowledge transfer; with a focus on research quality, citation impact, international student and staff ratios, and industry income generated by the institution. By focusing on highly ranked institutions, this research targeted those at the forefront of educational innovation, allowing for effective benchmarking and the identification of best practices. Additionally, the diversity of universities represented in THE rankings enriches the analysis by capturing a wide range of perspectives and strategies, ensuring the results are relevant and applicable across various educational contexts. Diverse geographical representation from different provinces across Canada ensured a balanced view of academic integrity policies across various regions and institutions.

The selection criteria for documents included availability of the document in the English language on the official website of the selected universities as per initial access dates, that is, February 1, 2024, and February 2, 2024. I removed the University of Montreal, Université Laval, and the Université du Québec from the curated list as their policies are available only in French. While language translators are widely available, the accuracy and nuances of translation, especially in the context of complex academic policies and guidelines, can vary. Inaccurate translations by third-party translators like Google Translate could lead to misinterpretations or misrepresentations of the original content, impacting the validity of the study findings. The exclusion of three universities with French guidelines reduced the risk of miscommunication or misinterpretation from translated materials, ensuring that the representation of universities from across different provinces of Canada was balanced. To accommodate for the removal of the three

French-only universities, I included the universities ranked 21 through 23 in the final list of university guidelines to be studied for this research (see Table 3).

Table 3

List of Top 20 Canadian Universities Studied for this Research

No.	Canada 2024 Rank	World University Rank 2024	University Generative AI Policy/Guideline (Clickable)	Province	City
1	1	21	University of Toronto	Ontario	Toronto
2	2	41	University of British Columbia	British Columbia	Vancouver
3	3	49	McGill University	Quebec	Montreal
4	4	=103	McMaster University	Ontario	Hamilton
5	5	=109	University of Alberta	Alberta	Edmonton
6	6	=111	University of Montreal	Quebec	Montreal
7	7	=158	University of Waterloo	Ontario	Waterloo
8	8	=177	University of Ottawa	Ontario	Ottawa
9	=9	201–250	University of Calgary	Alberta	Calgary
10	=9	201–250	Western University	Ontario	London
11	=11	251–300	Université Laval	Quebec	Quebec City
12	=11	251–300	Queen's University	Ontario	Kingston
13	=11	251–300	Simon Fraser University	British Columbia	Burnaby
14	14	301–350	Dalhousie University	Nova Scotia	Halifax
15	=15	351–400	University of Manitoba	Manitoba	Winnipeg
16	=15	351–400	University of Saskatchewan	Saskatchewan	Saskatoon
17	=15	351–400	University of Victoria	British Columbia	Victoria
18	=15	351–400	York University	Ontario	Toronto
19	=19	401–500	University of Guelph	Ontario	Guelph
20	=19	401–500	Université du Québec	Quebec	Quebec City

21	=21	501–600	Carleton University	Ontario	Ottawa
22	=21	501–600	Concordia University	Quebec	Montreal
23	=21	501–600	Memorial University of Newfoundland	Newfoundland and Labrador	St John's

Six of these twenty HEIs (University of Toronto, University of British Columbia, University of Waterloo, Queen's University, University of Manitoba, and University of Saskatchewan) hold membership in the International Center for Academic Integrity (ICAI) and are intensely engaged in academic integrity. The ICAI, founded by the educational integrity specialist Don McCabe in 1992, is known for developing the six fundamental values of academic integrity on which many HEI policies are built: honesty, trust, fairness, respect, responsibility, and courage.

Data Collection

The policies and guidelines described specific statements for defining Generative AI and related terms, its implications for education in the institutional setups, maintaining academic/educational integrity in the face of these emerging technologies, and recommendations for students and instructors on various aspects of Generative AI usage in their academic lives. Terminology for these policies and guidelines varies greatly among institutions, so multiple searches were undertaken using a range of combinations of multi-word terms along with the university name, including 'Generative AI policy,' 'recommendations on Generative AI,' 'academic integrity policy,' 'Generative AI guidelines,' and so forth.

Universities disseminate their policies and guidelines primarily through websites that combine policy details with educational multimedia such as FAQs, videos, quizzes, and links to

external organizations (For example, McMaster's website integrates various resources in the form of downloadable PDFs, podcasts, and even hosting a blog on this issue of Generative AI in education to improve AI literacy). I considered all formats of policies, guidelines, and recommendations acceptable documents for this study if these were the authentic versions of the universities' policies and procedures on Generative AI use and its link to academic integrity. Since most of these websites did not contain the information on a single page, data was collected by navigating through other sections and links on each site. The information was then copied and pasted into individual Google Docs. As a result, I compiled twenty documents, each containing the Generative AI guidelines of a selected university. Later, a separate Google Doc containing the content of these twenty documents was also created by merging the content of these twenty documents to facilitate data sharing and information retrieval.

I extracted and captured data from selected documents systematically to ensure reliability and accuracy in capturing information. I identified and coded relevant sections and extracted excerpts and quotations to condense the content into manageable themes. I meticulously documented and organized the data under identified themes concerning recommendations for different academic stakeholders, ensuring it was structured for easy reference and analysis. I regularly updated the sub-themes and categories with my subsequent readings of the documents.

Data Analysis

Bowen (2009) suggested that the document analysis process involves skimming (superficial examination), reading (thorough examination), and interpretation. Document analysis consists of partitioning the candidate documents into subdomains and selecting the subdomains for further analysis (Salminen et al., 1997). In general, document analysis involves a combination

of content and thematic analysis. Content analysis as a research technique refers to analyzing documents' words, language, or text (Bryman, 2003). The phases of content analysis of documents often include domain definition, category construction, sampling, analysis, and interpretation (Merriam, 1998). Thematic analysis is a form of pattern recognition with the document data that has elicited emerging themes and moved these into categories for further analysis. Thematic analysis entails careful, focused reading and re-reading of data, as well as coding and category construction (Bowen, 2009). Analyzing documents involves systematically identifying underlying themes in materials, analyzing these themes, and providing an interpretation that augments a theoretical argument.

The approach used to analyze the data extracted from the documents aligned with the research questions. The qualitative document analysis employed a systematic approach to identify themes and patterns related to using Generative AI tools in academic settings. The coding process involved the following steps (Creswell, 2014) for the systematic identification of codes and themes:

- Open Coding: The initial phase involved closely examining the data extracted from the documents to create descriptive codes that captured key concepts and ideas related to Generative AI guidelines.

- Axial Coding: Subsequently, connections between the initial codes were explored to group them into larger categories or themes. This process involved identifying overarching themes or sub-themes.

- Selective Coding: In the final stage, categories or themes/sub-themes identified during open and axial coding were simplified and combined to highlight the main themes or key ideas conveyed by the documents.

The coding framework in this research serves as a systematic method for analyzing qualitative data related to the use of Generative AI in educational settings. It involves categorizing and organizing information into themes and sub-themes, which helps in identifying patterns and insights regarding definition of Generative AI tools, academic integrity, guidelines for AI usage, ethical implications, and the impact of AI on education. This structured approach allows for a comprehensive understanding of how institutions address the challenges posed by Generative AI, ensuring that the findings are reliable and transferable to other higher educational contexts. By employing a coding framework, the research can effectively synthesize data from various sources, leading to nuanced conclusions and recommendations for stakeholders in the academic community.

Through a careful and focused reading of the literature on this topic, I identified *a priori* or preliminary, themes and codes (see Table 4) related to Academic Integrity Policies, Guidelines on Generative AI tools, Ethical Implications of Generative AI, Impact of Generative AI on Academic Integrity, Recommendations for instructors, Use of AI detection tools, and Acknowledgement of AI tools. I linked each of these themes with the relevant literature and research questions.

Table 4

Table of Preliminary Codes

Themes	Preliminary Codes	Definition	Citation	Research Question
Academic Integrity Policies	Punitive and Educative Approaches, Academic Integrity, Policy Review and Redevelopment	Refers to the policies established by academic institutions regarding academic integrity.	Perkins & Roe (2023)	RQ1

Guidelines on Generative AI	Stakeholders' Involvement, Educating Students, Training Faculty	Encompasses the guidelines and procedures specifically related to the use of Generative AI tools.	Chan (2023)	RQ1
Ethical Implications of Generative AI	Potential Bias, Unethical Usage, Fabrication of Research, False Information	Considerations and discussions surrounding the ethical aspects related to the use of Generative AI tools dedicated to addressing Generative AI issues.	Mijwil et al. (2023)	RQ1
Impact of Generative AI on Academic Integrity	Challenges in Assessment, Possibility of Plagiarism	Explores the impact of Generative AI tools on academic integrity within educational institutions.	Cotton et al. (2023)	RQ1
Recommendations for instructors	Understand the implications, Adapt, Minimize negative consequences	Includes recommendations and suggestions provided to instructors on integrating Generative AI.	Qadir (2023)	RQ2
Use of AI detection tools	Tools to detect AI-generated Content, Limitations of AI-detectors	Focus on the use and recommendation of AI detection tools to identify misuse of Generative AI	Uzun (2023)	RQ3
Acknowledgement of AI tools	Citation of AI tools, Acknowledgment	Guide the users on how to correctly and transparently acknowledge the use of AI tools in an assignment,	Foltynek et al. (2023)	RQ4

		dissertation, thesis, paper, or article.		

I began a thorough review of policies, procedures, and guidelines from twenty Canadian universities. I systematically and iteratively conducted manual coding of the documents. I created codes to represent specific ideas, recommendations, and guidelines, assigning them to relevant document sections. The preliminary codes were broad, and with a thorough analysis of the guidelines, I identified specific themes encompassing the preliminary themes and codes. Several of these themes emerged from the document analysis, adding to the preliminary themes. Appendix A presents the final themes derived from the analysis of the documents related to Generative AI guidelines in educational settings. These themes encompass the preliminary themes identified earlier and include additional themes that emerged during the analysis process. The comprehensive nature of these themes reflects a thorough examination of the data, capturing the complexities and nuances of how universities approach Generative AI. By integrating both initial and newly identified themes, the analysis provides a robust framework for understanding the various dimensions of Generative AI policies. This structured approach ensured that the results are well-organized and facilitate meaningful insights into the role of Generative AI in education.

Trustworthiness and Rigour

This study involved a thorough review of the Generative AI guidelines and policies of twenty selected universities across Canada with a qualitative document analysis methodology, ensuring a comprehensive understanding of the subject matter. The guidelines analyzed for this study represent official documents prepared by universities through their taskforces after detailed considerations, debates, and discussions among various stakeholders. As the selected documents

are official policies and guidelines developed by the universities to regulate the use of Generative AI tools and uphold academic integrity standards, analyzing these authoritative sources of information offers a structured and systematic way to understand the institutional stance on Generative AI. Hence, the research findings are appropriately transferable to other higher educational settings.

I maintained the dependability of this research by taking a systematic approach to maintaining a continuous record of collected data in the form of a Google Spreadsheet and twenty Google Docs (later merged into a single document). I properly noted the date the studied guidelines were accessed from their website and systematically entered the data retrieved from the guidelines on a spreadsheet.

I continuously reflected on my biases, assumptions, and perspectives during the research process. I also tried to maintain objectivity in this research through systematic data recording, data interpretation, and analysis using tables, figures, and charts. I also conducted an extensive literature review to support the methods and findings, enhancing the study's confirmability.

By implementing these strategies, the study aimed to uphold its findings' credibility, transferability, dependability, and confirmability, contributing to the robustness and reliability of the research outcomes in the realm of Generative AI guidelines in Canadian universities.

Chapter 4: Results

Description of the Sample

To understand how universities in Canada deal with Generative AI advancements through their Generative AI guidelines and policies, it was necessary to investigate policies and guidelines from universities across Canada. I selected twenty universities from different provinces of Canada.

Figure 2

Representation of Universities from Different Provinces
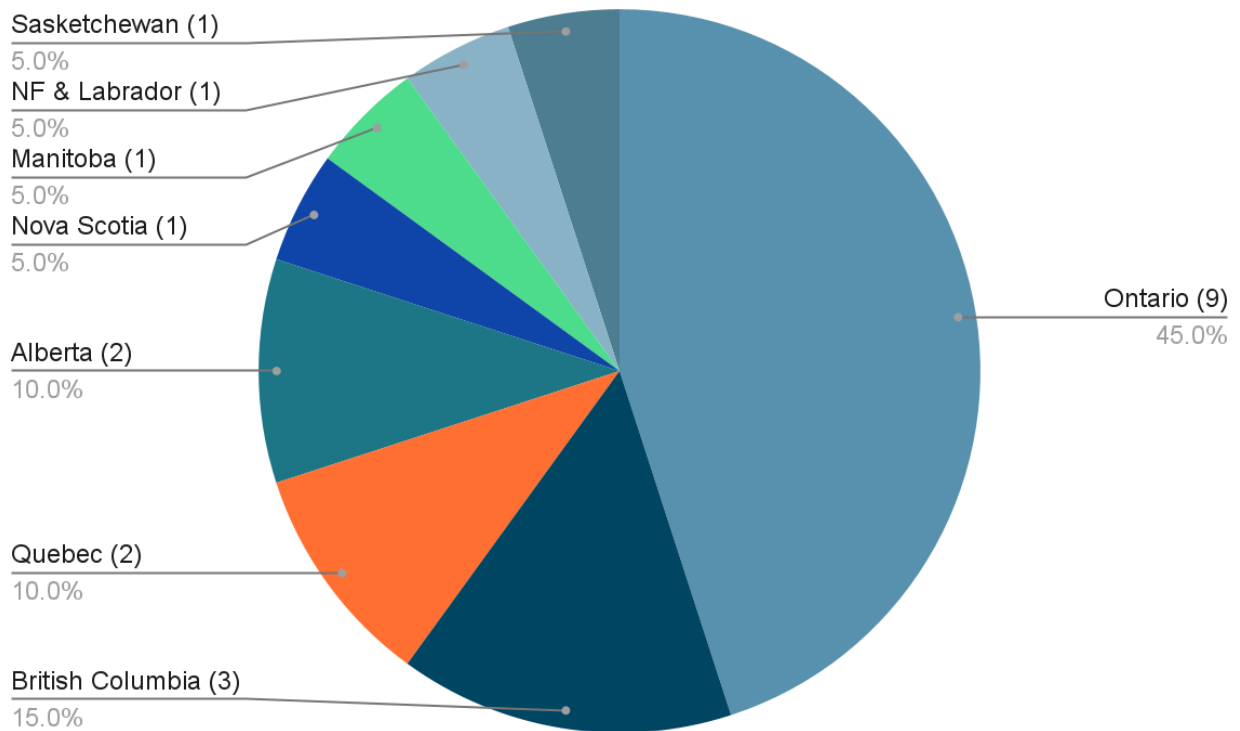
As evident from the above figure (Figure 2), nine of these twenty universities belong to a single province, Ontario. Three universities belong to British Columbia, two from Quebec and Alberta, and one from Nova Scotia, Manitoba, Newfoundland and Labrador, and Saskatchewan.

No universities from the remaining two provinces, Prince Edward Island and New Brunswick, are featured in the top twenty universities of Canada. These numbers led me to think about why Ontario is over-represented in the data, and I checked the population statistics of these provinces, which justified this seemingly skewed sample.

The representation of these eight provinces in top universities' rankings in Canada is more or less proportional to their share in the total population of Canada (see Figure 3). Quebec's data appears inconsistent, but three universities (University of Montreal, Universite Laval, and Université du Québec) from this province were removed from the list of twenty universities as these policies were available only in French.

Figure 3

Comparison of Population Share and Universities' Representation in Provinces
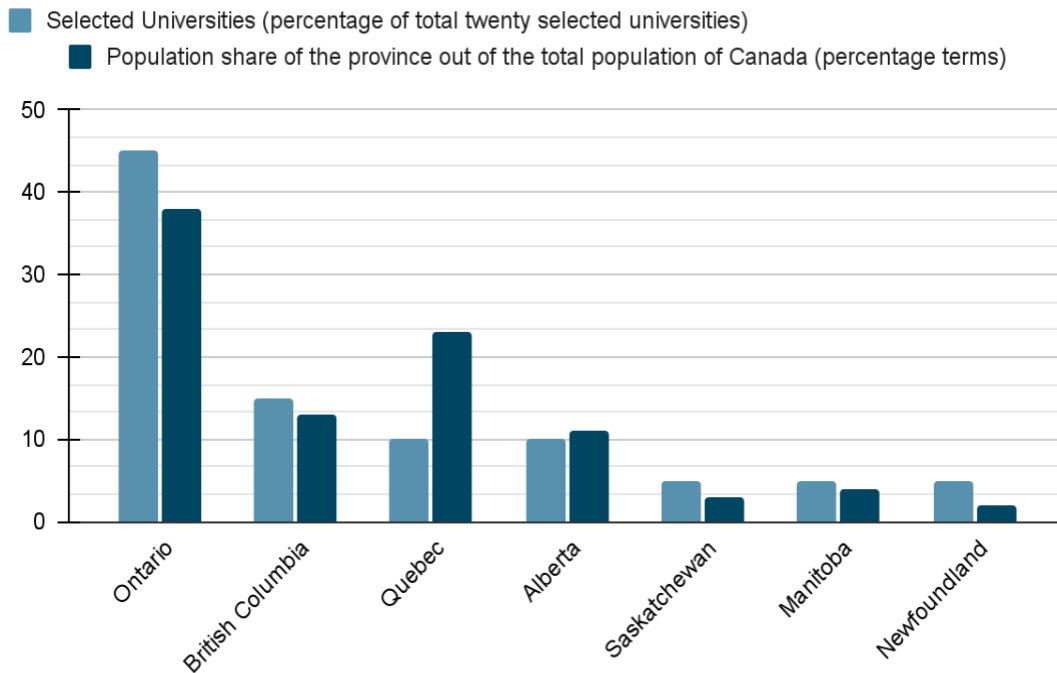
Examples of Generative AI tools as Given in the Guidelines

Generative AI tools exist in various functional domains (see Table 5). The guidelines

mention the different categories of generative tools and the examples under these categories.

Table 5

Examples of Generative AI Tools as Given in the Guidelines

University	Examples of Generative AI tools mentioned in the policy/guideline		
	Writing Assistant GenAI tools	Image/Video/Sound GenAI tools	Computer Code GenAI tools
University of Toronto	Bing, Jasper, Notion AI, Caktus AI, ChatGPT	DALL-E2, Midjourney, Stable Diffusion	GitHub, Copilot
University of British Columbia	Bing, Bard	DALL-E2	–
McGill University	ChatGPT, Bing, AnonChatGPT	Images - Bing, Adobe Firefly, Midjourney, DALL-E2, DiffusionArt Sound - Voiceify, Texttomusic Video - D-ID	GitHub, Copilot, AOC
McMaster University	Anthropic's Claude 2	Midjouney, Stable Diffusion, DALL-E, Adobe Firefly	Microsoft's Copilot, Code Interpreter
University of Alberta	Google Bard, Microsoft Bing	DALL-E2	–
University of Waterloo	It only mentions ChatGPT but acknowledges that other Generative AI software exists.		
University of Ottawa	Siri, Google Alexa, DeepL, ChatGPT, Jasper, Writer, Moonbeam	DALL-E 2, Midjourney, Stable Diffusion	GitHub, Copilot

University of Calgary	Jasper, Writesonic, Article Forge, WordAI, AI Writer, Ink, Moonbeam	Midjourney	–
Western University	ChatGPT, Bing, Claude	–	–
Queen's University	ChatGPT, Jenni AI Jasper AI, Writesonic, Bloomai, Microsoft Co-Pilot integrated with Bing and O365 applications, Google Bard	Stable Diffusion, Midjourney, Dall-E2	–
Simon Fraser University	ChatGPT, Bing	–	–
Dalhousie University	ChatGPT, Explainpaper, Goblin Tools, Hugging Chat	Elicit, Speaker Coach	–
University of Manitoba	ChatGPT, Google Bard	DALL-E, Midjourney	–
University of Saskatchewan	ChatGPT, Bing, Perplexity AI	–	–
York University	ChatGPT	DALL-E	–
University of Victoria	ChatGPT	–	–
University of Guelph	ChatGPT	–	–
Concordia University	ChatGPT	–	–
Carleton University	ChatGPT	–	–
Memorial University of Newfoundland	ChatGPT, Ecree, Writeful, TooWrite, CoAuthor	DALL-E, Movio	–

Farrelly and Baker (2023) list several Generative AI tools such as ChatGPT, Chatsonic, Stable Diffusion, DALL-E, CactusAI, NotionAI, BERT, Bing, ClickAI, Jasper, Wartune, Writesonic, Midjourney, Bard, and Llama. Some of these examples are also mentioned in these guidelines. Both the University of Saskatchewan and Memorial University of Newfoundland reference https://www.futurepedia.io/ and Lachief.io as growing repositories of Generative AI

tools. These examples underscore the variety of Generative AI tools for content creation across different media, emphasizing the need for careful selection based on ethical and educational considerations. Although the term 'ChatGPT' is often used to refer to a broad range of tools, this research has used 'Generative AI' or 'GenAI' to describe the technology in all its forms.

Construction of Themes

I have organized the results according to the identified themes (see Appendix A) to ensure that information is structured, systematic, and easily readable. Moreover, structuring and presenting recommendations on a stakeholder-specific basis under these guidelines was the most appropriate approach because it provides a robust foundation for developing a comprehensive set of Generative AI guidelines in the future. Following a thorough exploration of the results presented in this chapter, I will interpret and discuss these results in the context of the research questions and the general comprehensiveness of these guidelines in Chapter 5: Discussion.

The analysis of the content of the Generative AI policies of the selected universities revealed that the studied universities are mostly aligned in their approach to defining generative AI. The guidelines identify the ethical concerns related to Generative AI technology, give possible ideas of how Generative AI can be used in an academic environment, and provide recommendations for various stakeholders like students, instructors, employees, and researchers.

Theme 1: Definition of Generative AI according to the Studied Guidelines

The studied guidelines define Artificial Intelligence (AI) as a broad field encompassing numerous theories, technologies, and practices. They refer to Generative AI as AI that uses various machine learning algorithms to create new, unimodal (single mode - text or image, for example) or multimodal (multiple modes - text and image, for instance) content based on human user inputs

(or prompts). The twenty Generative AI guidelines commonly cover three aspects of these tools, and these resonate with how Lim et al. (2023) define Generative AI:

(i) Utilization of Machine Learning and Large Language Models

(ii) Capability to generate content in multiple formats (such as text, audio, visual, codes, etc.)

(iii) Ability to mimic human learning and problem-solving skills

University of British Columbia states:

Generative AI is a type of artificial intelligence that can produce new text, images, audio, and video in response to user prompts. It includes tools like ChatGPT, Google's Bard and Bing's Chatbot. Generative AI creates text that mimics human writing. It is a type of machine learning based on massive datasets that follows language patterns by predicting combinations of words that are likely to occur together. However, the ability to follow patterns is not the same as the ability to discern facts. It does not actually understand the context or the meaning of the text it creates (University of British Columbia).

Theme 2: Possible Uses of Generative AI in Education

Generative AI has diverse applications in education, specific applications include analyzing and summarizing text, writing computer code, translating languages, generating ideas, and producing text with specific attributes like tone and sentiment. These technologies can benefit both students and educators by providing personalized educational experiences tailored to individual learning styles, streamlining the creation of customized teaching materials, automating routine administrative tasks, and offering insights into student performance.

The University of Ottawa states:

AI is used in academia for various purposes, such as research, teaching, and improving learning outcomes. It can help researchers analyze large amounts of data, make predictions, and discovering new patterns. It's also used to enhance the learning experience through personalized feedback, recommendation systems, and gamification (University of Ottawa)

The University of British Columbia's guidelines describe the probable roles, pedagogical benefits, and pedagogical risks of AI use in an academic environment (see Figure 4).

Figure 4 *AI Uses and Probable Roles as per UBC Guidelines*

AI USE	ROLE	PEDAGOGICAL BENEFIT	PEDAGOGICAL RISK
MENTOR	Providing feedback	Frequent feedback improves learning outcomes, even if all advice is not taken.	Not critically examining feedback, which may contain errors.
TUTOR	Direct instruction	Personalized direct instruction is very effective.	Uneven knowledge base of AI. Serious confabulation risks.
COACH	Prompt metacognition	Opportunities for reflection and regulation, which improve learning outcomes.	Tone or style of coaching may not match student. Risks of incorrect advice.
TEAMMATE	Increase team performance	Provide alternate viewpoints, help learning teams function better.	Confabulation and errors. "Personality" conflicts with other team members.
STUDENT	Receive explanations	Teaching others is a powerful learning technique.	Confabulation and argumentation may derail the benefits of teaching.
SIMULATOR	Deliberate practice	Practicing and applying knowledge aids transfer.	Inappropriate fidelity.
TOOL	Accomplish tasks	Helps students accomplish more within the same time frame.	Outsourcing thinking, rather than work.

The different uses suggested by the studied guidelines indicate that Generative AI technologies hold potential for utilization in education by both students and educators.

Subtheme 2.1 Potential Applications of Generative AI for Students.

Universities recognize the potential of Generative AI to enhance interactive learning environments. These tools support personalized learning with timely feedback on drafts and facilitate exam preparation and language learning through practice questions and conversation assistance. Generative AI also offers significant benefits for students with special needs. By integrating voice recognition and computer vision, these tools can create tailored learning experiences. Advanced models can interpret users' environments, providing personalized inputs, particularly for visually impaired students.

McMaster University states that:

Strategies also exist for students to use generative AI tools to support their learning. For example, they can be used to brainstorm ideas; create images to support assignments such as presentations; and summarize documents (McMaster University)

Subtheme 2.2 Possible Uses by Instructors.

Baidoo & Owusu (2023) enumerate the main possible uses of Generative AI in Education by instructors as Personalized Tutoring, Automated Essay Grading, Language Translation, Interactive Learning, and Adaptive Learning. The universities expand on these use cases and analyze how the technologies can be leveraged to enhance the learning experiences.

McMaster University states that:

Many different strategies exist for using generative AI tools in course teaching. For example, instructors can use them to create sample texts for students to analyze; create images for presentations; design entire presentation materials; and generate sample practice questions (McMaster University)

Subtheme 2.2.1 Formative Assessment

Formative assessment using Generative AI involves leveraging AI tools to provide students with timely and constructive feedback on their work before final submission. This approach focuses on enhancing the learning process rather than merely evaluating the end product. AI can analyze drafts, suggest improvements in areas such as grammar, style, and argument structure, and offer personalized feedback.

McMaster University states that:

Formative feedback is feedback that is not for grades, but rather gives students fast and specific advice on how to improve. Formative feedback from a generative AI tool might be given on an essay outline or draft, for instance, while you or the teaching assistant would be responsible for assessing and grading the final essay submission (McMaster University)

Subtheme 2.2.2 Process-Driven Learning

Process-driven evaluation emphasizes assessing students based on their learning journey and the methods they use to arrive at conclusions, rather than solely focusing on the final product. This approach encourages students to engage in reflective practices, showcasing their thought processes, problem-solving strategies, and development over time.

University of Alberta states that:

When used ethically and in pedagogically sound ways, AI-tools can offer academics the chance to reconsider and reimagine an educational focus, not on deliverables and summative end-products (such as written assignments and standard exams) as measures of learning, but instead on process-driven and evaluated assessment (University of Alberta)

Subtheme 2.2.3 Generating Academic Content

Instructors can use AI to generate content in various ways, including creating study materials like summaries and quizzes, drafting lecture notes, and assisting with research by analyzing data and generating reports. AI can also personalize learning by tailoring content to individual student needs, provide initial feedback on assignments, and develop engaging educational games or simulations. By leveraging these capabilities, instructors can enhance their teaching effectiveness and improve student engagement.

McMaster University states that:

With respect to generating academic content or performing academic skills, you want to think carefully about what the core learning outcomes are for the course, and whether and how students can demonstrate these outcomes. Those skills or knowledge that are not essential to the core learning outcomes might be appropriate for 'cognitive offloading' to a generative AI tool. Cognitive offloading refers to the use of external resources or tools to change the information processing requirements of a task so as to reduce cognitive demand (McMaster University)

Theme 3: Ethical Considerations of Using Generative AI in Education

Baidoo and Owusu (2023) identify several ethical issues associated with the use of Generative AI in education, including lack of human interaction, limited understanding, bias in training data, lack of creativity, dependency on data, lack of contextual understanding, limited ability to personalize instruction and privacy concerns. Various universities echo these legal, ethical, political, ecological, social, and economic concerns, stressing the importance of assessing the capabilities, issues, and potential biases of GenAI tools.

McMaster University states that:

Broader issues related to generative AI include privacy of personal data, risks of misinformation, existential risks, concerns about job dislocation or loss, environmental costs, labour exploitation, and copyright (McMaster University)

Subtheme 3.1 Academic Integrity Concerns

The guidelines raise several academic integrity concerns regarding the use of generative AI, including the risk of misrepresentation and plagiarism, as students may produce assignments without proper attribution. Moreover, many students lack a clear understanding of the ethical implications of using AI, which can lead to unintentional violations. To address these issues, there is a need for comprehensive guidelines that define acceptable uses of AI tools and outline the consequences for violations.

McGill University states that:

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 (McGill University)

Subtheme 3.2 Misinformation and Disinformation

Misinformation and disinformation in generative AI content involve the generation of inaccurate or misleading information. Misinformation is shared without malicious intent, while disinformation is intentionally deceptive. Generative AI models can produce text that appears plausible but may include factual inaccuracies or fabricated details, known as "hallucinations." This concern is emphasized in universities' Generative AI guidelines and policies.

University of Ottawa states that:

One area where generative AI tools often fail is in repeating facts or quotations. To a model trained to sound convincing, the only important aspect of a fact is that it sounds like a fact. This means that models like GPT-3 frequently generate claims that sound real, but to an expert are clearly wrong (University of Ottawa)

Subtheme 3.3 Fabrications/Hallucinations

Certain AI tools, like Large Language Models such as ChatGPT, are prone to 'fabrications,' producing inaccurate, misleading, or harmful content that can perpetuate falsehoods based on their training data. These models are designed to sound convincing, prioritizing the appearance of factuality. Additionally, using ChatGPT as a "search engine" is problematic due to its tendency to generate factual errors and 'hallucinate' citations.

University of Alberta states that:

Since many of these tools are prone to fabrication (factual inaccuracies), don't trust its outputs. Assume they may contain errors unless you either know the answer or can confirm it using another source. You will be responsible for any errors or omissions provided by the tool that you fail to identify and resolve (University of Alberta)

Subtheme 3.4 Algorithm Bias

Generative AI tools can replicate social biases (racial and gender) and may miss critical balancing information, highlighting the need for users to apply critical thinking. Moreover, AI systems can be biased and discriminate if trained on skewed data.

Queen's University states that:

Generative AI tools, as they have been designed and developed, reproduce biases, reinforce discrimination, and amplify stereotypes, leading to further harm to equity-

deserving groups. This is because they use large amounts of data from the internet, and do not distinguish between reliable and unreliable data. (Queen University)

Subtheme 3.5 Diminishing Critical Thinking

Reliance on ChatGPT and other Generative AI tools in academic contexts may diminish traditional academic skills and critical thinking abilities. It is recommended to use critical thinking and analysis to understand the limitations of these tools, as AI often lacks the necessary critical thinking skills for academic work. More research is needed to assess how student use of these tools affects the development of critical thinking skills.

University of Calgary states that:

Explore AI software and tools to understand what they can and cannot do, especially with topics you already know a lot about. Take the time to critically analyse their response. AI often lacks the critical thinking skills needed to complete your assignments (University of Calgary)

Subtheme 3.6 Copyright Infringement and Intellectual Property Issues

Despite potential benefits, no universities recommend unrestricted use of Generative AI tools in academic settings. It is suggested that all tools, whether free or licensed, undergo a vetting process to ensure legal responsibilities are met, including intellectual property rights and privacy concerns. These recommendations arise from the need to address ethical considerations associated with using Generative AI in education.

McGill University states that:

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 for our collective and individual intellectual productions (McGill University)

Subtheme 3.7 User Data Privacy

Ethical concerns arise from requiring students to accept terms that allow AI tools to profit from their data. Sharing personal information with AI systems is discouraged due to privacy and security issues. Users should review data usage terms carefully, and instructors are advised to consult IT for security assessments before sharing personal information on educational software.

University of Ottawa states that:

AI systems raise important ethical and moral concerns, particularly in regard to privacy, data security, and the impact they may have on employment and other aspects of society. Be mindful of the data that AI systems collect; we strongly advise against sharing personal or private information (University of Ottawa)

Subtheme 3.8 Business Practices

OpenAI has been criticized for outsourcing toxic content identification to low-paid workers, raising ethical concerns about psychological harm. Data from students and instructors may be used to train AI models, risking the discrediting of their contributions. Mandating the use of these tools can result in free labour for companies, prompting caution about unrestricted use of Generative AI.

University of Waterloo states that:

Open AI, the company that developed ChatGPT, has been criticized for unethical and exploitative labour practices to clean its datasets of toxic content and hate-information (University of Waterloo)

Subtheme 3.9 Reduces Linguistic Diversity

Generative AI tools can limit linguistic diversity and create homogenized language output. This bias may marginalize non-standard languages and dialects, highlighting the need to consider these implications in AI development and usage.

University of Waterloo states that:

ChatGPT and similar GenAI defaults to generating text in Standard American English (SAE), which reduces linguistic diversity and stylistic variety. If you use ChatGPT as a model for your own writing or speaking or to give you examples to build from, consider how your voice, your languages, and your choices make your writing individual and unique (University of Waterloo)

Subtheme 3.10 Inequitable Access

Many AI tools require paid subscriptions, creating inequitable access for marginalized students who cannot afford them. However, some studies suggest that AI tools can reduce the cost of personalized tutoring for equity-deserving groups. Additionally, access to Generative AI tools may be restricted in certain countries due to government bans or censorship.

Carleton University states that:

Cost of tools poses a barrier for many students in accessing generative AI tools. With many tools currently available for free, some of these – like ChatGPT – have paid tiers with significant improvements in functionality and performance for paid subscribers. Those students who can afford to pay for paid tiers may be disproportionality advantaged in assignments that incorporate the use of generative AI (Carleton University).

Theme 4: Recommendations for Higher Education Institutions

Veletsianos (2023) recommends that higher education institutions should promote AI understanding and experimentation and develop supportive, context-aware AI plans that encourage responsible use. To ensure the responsible and ethical use of Generative AI in both academic and non-academic activities, higher education institutions should consider promoting research, establishing dedicated task forces, fostering AI Literacy, providing pedagogical support, developing resource modules, organizing educative sessions, including AI in administration, and establishing some fundamental principles of Generative AI use.

Subtheme 4.1 Promoting Research

There is a strong advocacy for funding research on the pedagogical applications, benefits, and risks of Generative AI tools in education.

McGill University states that:

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 (McGill University)

Subtheme 4.2 Establishment of Dedicated Task Forces

Task forces on Generative AI in Teaching and Learning have been formed, including diverse members from the academic community. They are crucial for ensuring the responsible use of AI in education.

University of Alberta states that:

Taskforce will provide recommendations back to our different university communities such as General Faculty Council, Faculty Councils, students and instructors on how best to deal

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with the opportunities and challenges of generative artificial intelligence in the learning

environment (University of Alberta)

Subtheme 4.3 Fostering AI Literacy

AI Literacy involves understanding and critically reflecting on AI applications without technical expertise. Emphasizing education on Generative AI tools, including their capabilities and ethical considerations, enhances student effectiveness. Continuous development of an inclusive education program is essential to keep pace with AI advancements while prioritizing equity and privacy.

McMaster University states that:

While introducing AI literacy within the academic setting (in addition to peer-to-peer and self-directed learning) will benefit students' ability to use the tools effectively in academic and career settings, the academic integrity literature also suggests that if students are taught how to use generative AI tools effectively and in accordance with the expectations of the course, they are likely to use these tools appropriately (McMaster University)

Subtheme 4.4 Providing Pedagogical Support

Instructors should be supported in learning about Generative AI tools for teaching and assessments, engaging in discussions on ethical impacts and academic integrity. Guidelines promote discipline-specific enhancements and encourage creative use of AI technologies to foster dialogue on ethical and societal implications.

McGill University states that:

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
(McGill University)

Subtheme 4.5 Development of Resource Modules

Some university guidelines mention the resource modules created for faculties and students to ethically leverage Generative AI tools in teaching and learning. These modules guide instructors in understanding optimal AI use and often include links to external resources and documents explaining key AI terms.

Concordia University states that:

Faculty need to equip students with the knowledge and skills needed to responsibly engage
with GenAI tools. Develop modules that emphasize the ethical use of AI, including proper
citation of AI-generated content (Concordia University)

Subtheme 4.6 Organizing Educative Sessions

Guidelines suggest creating centralized educational programs for staff and students, including self-paced modules and courses, to address the ethical implications of Generative AI, appropriate usage, and respect for intellectual property. A community of practice can also host monthly sessions for presentations and discussions.

McGill University states that:

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 (McGill University)

Subtheme 4.7 Inclusion in Administration

McGill University states that: It is recognized that Generative AI will impact not only classroom settings but also administrative functions such as data management, scheduling, and resource allocation. Institutions are encouraged to adopt ethical and productive uses of Generative AI in these areas as well.

McGill University states that:

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. (McGill University)

Subtheme 4.8 Principles of Academic AI Use

The policies regarding the use of generative AI in education emphasize several key principles. For example, they highlight the importance of ethical use, ensuring that both instructors and students understand the implications of AI on academic integrity. These principles aim to promote responsible and effective use of generative AI while enhancing the educational experience.

Western University states that:

Before considering specific roles and example use-cases, we suggest ethical principles that can help guide our community's engagement with generative AI:

- ***Transparency****: The algorithms, data, and design decisions underlying AI systems, and the applications of AI systems, should be openly accessible to the extent possible.*

- ***Accountability****: Individuals and teams using generative AI bear the responsibility for the consequences of the AI's actions and decisions.*

- *Integrity: The use of generative AI in academic work must be clearly disclosed to preserve the principle of academic honesty.*

- *Privacy: Personal data should be adequately protected, and AI should not be used to infringe upon individuals' privacy rights.*

- *Inclusion: Accessibility and fairness in AI tools should be actively considered, ensuring they don't perpetuate existing biases (Western University)*

Theme 5: Recommendations for Instructors

Qadir (2023) notes that evolving technologies like generative AI place instructors at the forefront of transformation. This transformation is based on course learning outcomes, instructors' individual interests, and the discipline's conventions and expectations. However, instructors have the autonomy to use generative AI tools for teaching and learning, and the universities provide them with some basic recommendations on how they can teach with and teach about generative AI. The guidelines also elaborate on the use of AI detectors and innovative assessment strategies that can be used by instructors to deal with the rising use of generative AI.

Subtheme 5.1 Embracing Experimentation with Generative AI in Educational Settings

Experimentation with Generative AI tools is crucial as the field evolves and optimal usage remains undefined. Instructors are encouraged to explore tools like ChatGPT to assess their effectiveness in assignments and improve text coherence. Contextualizing experimentation within specific tasks helps understand student usage through strategic prompt engineering. Caution is advised to protect personal information, and guidelines affirm that openly licensed works can be used with new technologies, respecting license conditions and intellectual property.

McMaster University states that:

Instructors are welcome and encouraged to test ChatGPT, use of which is currently free upon registration. You can also test other similar AI tools to assess their capability, for instance to see if they can respond to the assignments used in your courses, or the way in which they improve the readability and grammar of a paragraph. Experimentation is also useful to assess the limits of the tool (McMaster University)

Subtheme 5.2 Communicating Expectations with Students

Universities are promoting clarity in the use of Generative AI tools by encouraging instructors to outline appropriate usage in syllabi and engage students in discussions about ethical considerations, such as equity and privacy. Clear communication of expectations helps students navigate AI's ethical and practical aspects. Instructors should co-create guidelines with students, facilitate discussion threads, review privacy policies, and explore AI's implications in their fields. This approach fosters ethical behavior, academic integrity, and student engagement.

Dalhousie University states that:

Communicating with your students about A.I. is important. In addition to a general conversation about A.I., including the equity and privacy concerns around its use, you will want to talk with your students about when and how they may choose to use it for course work, and about circumstances where its use may not be appropriate or allowed. In addition to in-class discussions, these same ideas can be added to your syllabus (Dalhousie University).

Subtheme 5.3 Clarity in Syllabi Statements and Course Outlines

To assist instructors in navigating the use of Generative AI in courses, some institutions provide sample syllabi statements (See Table 6). Instructors are encouraged to specify which AI tools may

be used and any restrictions on their usage in learning outcomes and assessments. Three sample statements include:

i) **Permitted with citation**: Students may use Generative AI tools like ChatGPT, provided they cite the generated material. Any other use violates academic integrity.

ii) **Permitted for specific assignments with citations**: Generative AI tools are allowed only when explicitly noted in assignment instructions, and students must cite the generated material. Any other use violates academic integrity.

iii) **Not permitted**: The use of Generative AI tools in submitted work is prohibited, and original work must be completed solely by the student.

McMaster University states that:

There should be no default assumption as to the use of generative AI tools. Therefore, University recommends that instructors explain to students in their course outline what the appropriate use or non-use is of generative AI tools in the context of that course. The use or non-use of these tools should align with the learning outcomes associated with the course. For this reason, instructors will need to write their own context-appropriate course outline statements (McMaster University)

Table 6

Sample Syllabi Statements Given in the Guidelines

No.	University	Sample Syllabi Given	No.	University	Sample Syllabi Given
1	University of Toronto	YES	11	Simon Fraser University	NO
2	University of British Columbia	YES	12	Dalhousie University	YES

3	McGill University	YES	13	University of Manitoba	YES
4	McMaster University	NO	14	University of Saskatchewan	NO
5	University of Alberta	NO	15	York University	NO
6	University of Waterloo	NO	16	University of Victoria	YES
7	University of Ottawa	NO	17	University of Guelph	NO
8	University of Calgary	NO	18	Concordia University	NO
9	Western University	NO	19	Carleton University	YES
10	Queen's University	YES	20	Memorial University of Newfoundland	NO

Subtheme 5.4 Ensuring Equitable Access

Instructors should ensure digital equity and accessibility when allowing the use of Generative AI tools in courses. They must consider the cost barriers of paid tools, which can disadvantage some students. Educators are encouraged to design activities using free AI tools and provide options for students to opt out of AI-based assignments, offering alternative assessments for those who prefer not to use AI or face restrictions due to regulations.

Queen's University states that:

Some generative AI tools are available free of cost for a limited time or have free tiers with fewer functionality than paid tiers. Consider whether asking students to use such tools in courses might mean that those who can afford to pay have a disproportionate advantage over those who cannot (Queen's University)

Subtheme 5.5 Teaching About Generative AI

Instructors should ensure students understand Generative AI tools and their academic implications. This includes teaching key terms, terms of use, and data utilization to highlight ethical and social criticisms. Additionally, fostering discussions on ethical AI use, potential biases,

and the importance of acknowledging AI assistance encourages students to reflect on responsible choices in their academic work.

University of Alberta states that:

Identify creative uses for generative AI in your course (idea generation, code samples, creative application of course concepts, study assistance, language practice). Discuss limitations of tools like ChatGPT in the topics covered by your course, including the limitation of data used (prior to 2021), factually inaccurate information, biases and discrimination in the data used to generate text and in the output, and the use of culturally inappropriate language and sources. (University of Alberta)

Subtheme 5.6 Pedagogical Uses of Generative AI/Teaching with Generative AI

Instructors can utilize Generative AI as a pedagogical tool in various ways. AI can enhance learning by generating study materials such as summaries, flashcards, and quizzes. It can also analyze large datasets and make predictions, providing deeper understanding of topics. Additionally, AI can create interactive educational games to motivate learning and retention, assist in managing courses through scheduling and administrative tasks, and support research by analyzing data, making predictions, and discovering new patterns. However, there are concerns about the ethical use of these tools.

Subtheme 5.7 Use Of AI-Detectors

A primary concern for instructors is the misuse of Generative AI, which can hinder student engagement in learning. Many institutions are considering AI detectors but express significant reservations due to their unreliability, frequent false positives and negatives, and privacy issues. Some institutions prohibit their use based on personal information protection policies.

Concerns about the accuracy of these tools are widespread, especially regarding bias against non-native English speakers, leading to misclassification of their work. While some have tested AI detection features in plagiarism checkers, issues of reliability and security persist. Consequently, many universities advise against relying solely on AI detection tools for academic misconduct decisions, emphasizing the need for transparency and adherence to standard misconduct processes.

Concordia University states that:

Online detectors, like GPTZero are known to be unreliable – commonly producing both false positive and false negative results. There are additional privacy concerns surrounding the use of such detectors, making them an overall unsatisfactory response (Concordia University)

Subtheme 5.8 Assessment Redesign

According to Moorhouse et al. (2023), the development of Generative AI technologies has complicated the higher education institutions' assessment landscape and blurred the line between acceptable and unacceptable practices. The lack of clarity could be troubling for instructors and learners, who look to institutional guidelines to guide their practices. The studied universities have given due consideration to the need for assessment redesign to keep academic integrity intact from probable misuse of emerging Generative AI technologies.

McMaster University states that:

Assessment alternatives that may be less susceptible to the use of generative AI include oral exams, presentations followed by a Q/A, invigilated/in-class assessments, practical tests, assessments that incorporate class discussion/activities, and process-based work (McMaster University)

Theme 6: Recommendations for Students

Universities require students to uphold academic integrity and follow their academic code of conduct while encouraging experimentation with the GenAI technology. Students must provide appropriate citations for AI usage to maintain transparency and uphold their commitment to academic integrity and seek help from instructors when in doubt.

McGill University states that:

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 task (McGill University).

Dalhousie University Generative AI guide takes this graphic (see Figure 5) out from UNESCO's quickstart guide on Generative AI to help students decide if they should use ChatGPT or other Generative AI tools:

Figure 5

Safe Case Scenario for Using ChatGPT

Start

Does it matter if the output is true?

Yes

No

Do you have the expertise to verify that the output is accurate?

Yes

Are you willing and able to take full responsibility (legal, ethical, etc.) for missed inaccuracies?

Yes

No

No

Possible to use ChatGPT*

Unsafe to use ChatGPT

Safe to use ChatGPT
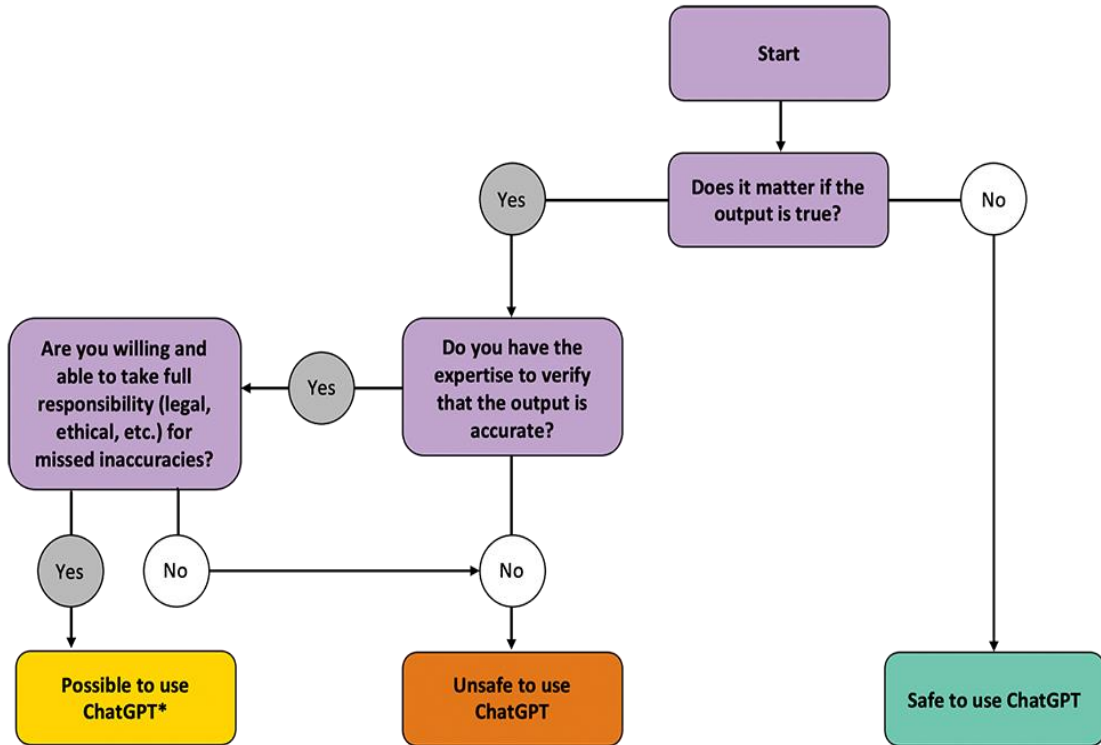
Subtheme 6.1 Exploration/Experimentation with Emerging Technologies

The Universities encourage students to explore and critically analyze AI software and tools to understand their capabilities, particularly in familiar subjects.

University of Alberta states that:

Learning to use AI tools well will take time and practice, so be proactive and set aside some time to 'play' with the AI tools used in this class. Since AI Literacy is an emerging skill (for instructor and student), we will experiment together to discover how best to use them for our academic work and learning (University of Alberta).

Subtheme 6.2 Citation, Acknowledgement, and Documentation of AI-generated Content

The use of Generative AI is permitted as per the studied guidelines if there is transparency through documentation and citation regarding how and where it is used.

Subtheme 6.2.1 Citation

Proper citation practices are emphasized as essential for ethical scholarly conduct, acknowledging sources, and helping others understand the origin of information. Students are required to show that their sources include either quoted or paraphrased information from a Generative AI platform. The universities also provide different formats like American Psychological Association (APA), the Modern Language Association (MLA), and the Chicago Manual of Style (CMS)] to cite the use of Generative AI.

University of Waterloo states that:

Citation is a way to demonstrate your critical thinking by showing how you can bring ideas and perspectives from others together with your thinking. You are expected to search for evidence from a variety of research sources. Do not rely on ChatGPT as your primary or only source of information, even if you find other citations to support what ChatGPT has produced. Citation is also a necessary part of managing your academic integrity. If you do include information from a GenAI platform, either quoted or paraphrased, you must show that this is where it came from. If you confirm that information via another source, which is recommended, you should include that citation reference as well (University of Waterloo).

Subtheme 6.2.2 Documentation

Documentation refers to the systematic recording and organization of information, data, or evidence. The guidelines mention that documentation should include any content produced by AI tools and the prompts used to generate that content. This documentation may be in the form of a reflective summary, an appendix or a part of methodology.

University of Waterloo states that:

Documenting refers to keeping track of your activities with GenAI and your corresponding actions. These actions may be related to idea generation and drafting, so documentation is not limited to what ends up in your finished document. While ChatGPT keeps a record of your prompts and its responses by default, your documentation will (a) form a summary of these activities, and (b) identify what actions you took as a result of your interactions with GenAI (University of Waterloo).

Theme 7: Recommendations for Researchers

Some Universities give recommendations for researchers as well.

Western University states that:

Employing AI in primary research is governed by all the same policies and regulations that govern non-AI-assisted research. Most publishers will not accept AI as a co-author, but many require disclosure of how AI was used in the preparation of the manuscript (and, of course, in the conduct of the research). In the preparation and evaluation of grants, there are some funding agencies (e.g., NIH and CIHR) that have issued direct guidance on permitted use of Generative AI while others are relying on existing policies, most importantly the recognition that a Principal Investigator is fully and solely accountable for what they submit (Western University)

Theme 8: Recommendations for Employees

As the use of Generative AI will not be limited to the classroom and it will impact administrative functions of the higher education institutions; in addition to the instructors, students, and researchers, some universities provided recommendations for the employees on the issue of Generative AI use in their administrative tasks.

Western University states that:

You must respect all existing policies with special attention to those around privacy and data security. You should not, e.g., submit <u>personal information</u> to an insecure public chatbot like ChatGPT. But where it is appropriate, you should feel empowered to experiment with how these tools can improve your work life. If you aren't sure if a use case is permitted, ask your supervisor (Western University)

Chapter 5: Discussion

Though the previous chapter explored aspects of answers to the research questions, this Chapter interprets the results with reference to the research questions and provides additional insights concerning the universities' comprehensiveness of their Generative AI policies and guidelines.

RQ1. How are universities in Canada dealing with Generative AI advancements through their Generative AI Policies or Guidelines?

Multiple benefits are associated with using Generative AI in an educational space (Dalalah & Dalalah, 2023; Cotton et al., 2023). This research highlights that higher education institutions in Canada have recognized these opportunities of Generative AI, such as ChatGPT, and have developed guidelines to advise instructors and students on their usage in line with Chan's (2023) emphasis on developing clear and consistent guidelines and policies by higher education institutions on Generative AI. The guidelines developed by the institutions in Canada do not impose a blanket ban on Generative AI tools. Instead, they advocate for their appropriate and ethical use in educational contexts while acknowledging potential concerns. These concerns, which are also highlighted by Veletsianos' (2023) findings, include biases in algorithms and the risk of using Generative AI in ways that could compromise academic integrity and intellectual property rights.

Guidelines Within the Framework of Existing Policies

The issue of academic integrity in the context of Generative AI tools like ChatGPT is addressed by several universities within their existing frameworks of educational policies in form of recommendations and guidelines. For example:

Western University emphasized that creating policies for rapidly evolving technologies is challenging. Instead of formulating new policies for Generative AI, it relies on existing academic integrity policies. Any misuse of AI that violates course rules is considered a breach of academic honesty.

University of British Columbia (UBC) referred to its academic integrity policy, which considers any attempt to gain an unfair academic advantage as misconduct. While AI tools like ChatGPT are not explicitly mentioned, their unauthorized use could be deemed an unfair advantage or an unauthorized means of completing an assignment.

These universities have adopted a common approach – rather than creating new, specific policies for Generative AI, they incorporate the use of such technologies into their existing academic integrity frameworks. Unauthorized use of AI tools is thus being treated as various forms of academic misconduct, such as plagiarism, use of unauthorized aids, or submission of false information.

Though the universities have developed some basic guidelines within their existing academic integrity policies. Considering the evolving generative AI technologies there is a need for continuous review and updating to remain relevant and clear (Perkins & Roe, 2023). Perkins and Roe (2023) further add that these updates should provide explicit instructions about what constitutes acceptable and unacceptable uses of AI tools. Regular updates can minimize potential misunderstandings and clarify the newer concepts related to Generative AI and the consequences of policy breaches, enhancing the comprehensiveness of these policies and guidelines.

RQ2. What recommendations do universities make for instructors regarding redesigning assessment in the face of Generative AI use?

Tertiary institutions worldwide must quickly consider how these new technologies might impact current assessment structures (Birks & Clare, 2023). Shiri (2023) established that there are efforts underway by academic and educational institutions to develop recommended practices for alternative assessment approaches and academic integrity policies. In the assessment redesign strategies of the studied universities, I identified several key recommendations and approaches in these guidelines:

1. Focusing on the process over the product in writing assignments to enhance student engagement and learning outcomes.

2. Using scaffolded assignments to guide students through the writing process incrementally improves writing and learning outcomes.

3. Breaking down assignments into stages with detailed instructions and time allocations to reduce stress and the need for external help.

4. Providing students with a choice among modes of assessment to support diverse learners in expressing their learning.

5. Implementing authentic assessment practices to promote deeper learning experiences and holistic understanding.

6. Formulating real questions grounded in ongoing debates within disciplines to foster critical thinking and deter reliance on AI tools.

7. Prioritizing evidence of original thought and critical thinking in student work to differentiate from AI-generated content.

8. Incorporating disciplinary, situational, and individual-based questions into assessments to encourage the application of knowledge in context and challenge AI responses.

9. Designing assessments that connect to class discussions, online forums, or previous courses to enhance relevance and authenticity.

These strategies aimed to address the challenges posed using Generative AI tools in academic settings and promote academic integrity. Some common themes included experimenting with Generative AI tools in assessments, clear communication between instructors and students regarding the use of AI technology, integration of AI detection tools to prevent plagiarism, and redesigning assessments to focus on higher order thinking skills not easily replicated by AI tools. Additionally, universities emphasized the importance of authentic assessment practices, personalized and contextualized assessment tasks, and fostering deeper student engagement through real-world problem-solving and experiential learning opportunities. Moorhouse et al. (2023) commented that though instructors are given advice on modifying their assignment tasks in the Generative AI world (e.g., blogs, newsletters), many look to their institutions for guidance and direction regarding assessment with Generative AI. By recommending these assessment strategies, universities sought to guide instructors and ensure that assessments accurately reflect students' understanding, critical thinking abilities, and disciplinary expertise while mitigating the risks associated with the misuse of Generative AI tools in academic work.

Furthermore, the idea of post-plagiarism (Eaton, 2023) encourages a shift in pedagogical approaches, urging educators to redesign assessments that prioritize the process of learning over the final product. This aligns with the research's recommendations for universities to support instructors in creating engaging and meaningful learning experiences that integrate AI tools responsibly.

RQ3. Do universities recommend that instructors use AI detection tools in their Generative AI policies or guidelines? If not, why?

Foltynek et al. (2023) asserted that it is increasingly challenging to reliably distinguish AI-generated content from human-produced content. Dwivedi et al. (2023) agreed that as AI improves its ability to imitate human-like text, traditional plagiarism-detection tools are becoming ineffective because AI-generated text is considered original and thus remains undetectable. The guidelines and policies I studied also echoed these concerns, and there was a noticeable split in the approaches among universities regarding the use of AI detection tools. (see Table 7)

Table 7

Use of AI Detectors Recommended by the Guidelines

No.	University	AI detectors recommended	No.	University	AI detectors recommended
1	University of Toronto	NO	11	Simon Fraser University	NOT MENTIONED
2	University of British Columbia	CAUTIOUS USE	12	Dalhousie University	NO
3	McGill University	NO	13	University of Manitoba	NO
4	McMaster University	CAUTIOUS USE	14	University of Saskatchewan	NO
5	University of Alberta	JUST A CAUTION	15	York University	NO
6	University of Waterloo	NOT MENTIONED	16	University of Victoria	NOT MENTIONED
7	University of Ottawa	NO	117	University of Guelph	NO
8	University of Calgary	NOT MENTIONED	18	Concordia University	NO
9	Western University	JUST A CAUTION	19	Carleton University	NO
10	Queen's University	NO	20	Memorial University of Newfoundland	YES

As the above table shows, most universities do not encourage using these tools. The universities cite reliability (potential for false positives and negatives) and data privacy (worries

about how third-party AI detection tools handle student data, including data breaches or misuse risks) as primary concerns while cautioning against or discouraging using AI-detection tools. Despite this general caution against the use of AI detectors by the studied universities, some institutions allow AI detection tools but recommend a cautious approach. They emphasize the importance of privacy checks, allowing only AI detectors that have passed stringent privacy checks established by the universities. On the other hand, Memorial University of Newfoundland (MUN) takes a more proactive stance by listing specific AI detectors that instructors can use to verify the authenticity of student work. However, the consensus remains that careful human observation and inspection are the most reliable methods for detecting AI-generated work. Guidelines for detecting such content as also identified by Cotton et al. (2023), include looking for repetitiveness, lack of nuance, generic descriptions, inconsistencies, a neutral tone, semantic errors, and absence of critical thinking, among other indicators.

Concordia University has prepared two checklists to detect potential use of Generative AI. One is for detecting potential misuse (see Table 8), and the other one is for identifying appropriate use (see Table 9) of Generative AI.

Table 8

Checklist for Detecting Potential Misuse of Generative AI

Level	Factor	Points
Potential Evidence	Writing is overly broad or generic	1
Potential evidence	Departure from the student's usual style	1
Potential evidence	Lacks specificity related to class content	1
Moderate evidence	Incorrect information related to class concepts	2
Moderate evidence	Inappropriate responses to assignment prompts	2
Moderate evidence	Overly polished writing beyond student's abilities	2

Strong evidence	Student unable to explain or discuss work in detail	3
Strong evidence	Text that includes fabricated references	3
Strong evidence	Student admits to Generative AI misuse	3

Note: Please consider the ranges: Minimal evidence (0-2 points), moderate evidence
(3-5 points), and strong evidence (6+ points).

In addition to this, Concordia University has developed a checklist to identify student work

that effectively integrates AI as a resource, providing a balanced approach to recognize students

who use Generative AI to enhance their learning and original thought.

Table 9

Checklist for Detecting Exemplary Use of Generative AI

Level	Factor	Points
Developing	Writing reflects the student's voice and style	1
Developing	Specific details related to class concepts	1
Developing	Students can explain in their own words	1
Competent	Accurate information related to course content	2
Competent	Appropriate responses to prompts	2
Competent	Writing quality matches student's abilities	2
Mastery	Student cites AI as a resource appropriately	3
Mastery	Student understands and can discuss work	3
Mastery	Writing shows original thought and effort	3

Note: Please consider the ranges: Developing (0-3 points), Competent (4-7 points),
and Mastery (8+ points)

Human inspection, particularly with experience, can help identify AI-generated content by

flagging false references and notable differences in writing style. However, this places a

considerable burden on instructors and teaching assistants. A key question arises: Should educators

act as trusted guides or as surveillance agents? Ultimately, detection and enforcement will be challenging, with policies primarily relying on self-compliance.

Additionally, the guidelines are in line with Atlas' (2023) suggestion, which recommends that educators play a more proactive role in designing authentic assessments that are less susceptible to AI manipulation, promoting scaffolded evaluations that make it difficult for students to rely solely on AI tools, and engaging students in discussions about academic integrity to foster a deeper understanding of its importance (Tlili, 2023). McMaster University particularly underscores the need to prioritize student learning over merely catching cheaters, suggesting that fostering a culture of academic integrity is a more effective long-term strategy than relying heavily on detection tools. Luo (2024) also agrees that shifting the focus from surveillance and prevention of academic misconduct to supporting students in producing original work can increase student engagement and empowerment in the learning process. Overall, while a few universities permit using AI detection tools under strict conditions, the prevailing attitude is one of caution, emphasizing privacy protection, authentic assessment design, and education on academic integrity to address the challenges posed by Generative AI.

RQ4. How do universities recommend that students utilize Generative AI tools in assignments and research works?

Universities agree with Halaweh (2023) and Dalalah and Dalalah (2023) on the need to encourage proper citation and attribution practices. Universities are still learning to devise approaches to address this issue. Twelve of the twenty studied universities provide formatting guidelines for the citation of AI-generated content (see Table 10). These universities employed various approaches in recommending the citation of AI-generated content. Some institutions

advise treating AI-generated materials as a non-recoverable source or akin to personal communication, suggesting adherence to relevant citation guidelines with the chosen reference style. In a more progressive stance, some universities argue against labelling AI tools' output as 'personal communication' due to the non-individual nature of AI, proposing an alternative citation style that excludes authors and omits AI-generated work from the reference section of research works. One of the studied universities offers a distinctive solution by permitting Generative AI to assist in drafting text but not for direct copying. It requires students to differentiate their work from AI-generated content, potentially through colour-coding and documenting the prompts used in the process. Emphasizing the significance of proper citation, universities view it as essential for engaging in ethical academic research, showcasing critical thinking by integrating external ideas into one's thought process while also cautioning against excessive reliance on AI tools as primary information sources. Through these varied perspectives on citing AI-generated content, universities aim to guide students in ethically acknowledging the use of AI tools, fostering critical thinking skills, and upholding academic integrity in the dynamic realm of technology integration in education.

APA, Chicago Manual, and MLA have provided some preliminary guidance on the citation of Generative AI Content. Six of the studied provide links to these resources in their guidelines. Some universities provide a reference guide that comprehensively suggests citation and considerations for APA, Chicago Manual of Style, IEEE, JAMA, and MLA Citation Styles when using and citing generative AI.

Table 10

Recommendation on AI-content Citation in Guidelines

S.No.	University	Recommendation on citation	S.No.	University	Recommendation of Citation
1	University of Toronto	YES	11	Simon Fraser University	NO
2	University of British Columbia	YES	12	Dalhousie University	NO
3	McGill University	YES	13	University of Manitoba	YES
4	McMaster University	YES	14	University of Saskatchewan	YES
5	University of Alberta	YES	15	York University	NO
6	University of Waterloo	YES	16	University of Victoria	NO
7	University of Ottawa	NO	17	University of Guelph	YES
8	University of Calgary	YES	18	Concordia University	NO
9	Western University	NO	19	Carleton University	YES
10	Queen's University	YES	20	Memorial University of Newfoundland	NO

I observed that the guidelines provided links to other universities' recommendations on the citation of Generative AI, including references to prominent universities, even those from outside Canada, by two of the studied universities. This use of external resources from other universities depicted an interlinkage among universities' guidelines, which suggests that though higher education institutions are developing recommendations independently to address their specific needs and considerations, they are also learning from each other to deal with the academic challenges emerging due to the use of Generative AI tools.

Comprehensiveness of Generative AI Policies or Guidelines

The analysis of Generative AI policies and guidelines is a novel area of research, and there needs to be more literature available to comment on the comprehensiveness of academic integrity policies. Based on my analysis of the collected data, it is evident that some generative AI policies and guidelines need more comprehensive information in several critical areas. This observation

aligns with the findings of Veletsianos (2023) in his work titled *Generative Artificial Intelligence in Canadian Post-Secondary Education: AI Policies, Possibilities, Realities, and Futures*. His research indicates that the policies and guidelines by Canadian higher education institutions are still in their infancy. Additionally, faculty members and administrators have mixed feelings about AI, and its use is irregular and largely guided by individual faculty members. My research also found that these universities vary in their efforts to include details on risks, potential uses and concerns, and the resources for students and instructors in their guidelines. While some universities have quite detailed guidelines, others need to seriously consider expanding their guidelines on the various academic issues of using Generative AI.

Some universities do not provide specific and clear guidance, such as detailed use cases and precise definitions of terms like 'ethical use' and 'misuse.' This lack of clarity can lead to confusion about what constitutes acceptable AI practices. This research found that many universities lack robust policy frameworks specifically tailored to address the use of Generative AI in higher education assessment, leading to difficulties in effectively regulating its use. Additionally, the scope and applicability of these policies are limited, failing to address the diverse ways different disciplines use generative AI and overlooking non-academic applications, such as extracurricular activities and administrative functions. Another significant gap is in implementation and enforcement. Many policies do not outline clear mechanisms for monitoring AI use, ensuring compliance, or specifying the penalties for violations.

Furthermore, many of these guidelines need more support and resources, including comprehensive training programs and technical support for students and instructors. Stakeholder involvement in creating and revising AI policies is also insufficient. Moreover, policies also need provisions for regular updates to keep pace with rapid advancements in AI technology and

structured feedback mechanisms for continuous improvement. When updating these policies, it is essential to consider various types of Generative AI tools, such as image-generating AI tools like MidJourney, Dall-E 2, Imagen, and Stability AI's Stable Diffusion, and code-generating generative AI tools like OpenAI Codex, CodeT5, Copilot, SourceGraph's Cody, and Tabnine.

Before researching this topic, I was unaware of the extensive uses of Generative AI and the concerns this technology raises. Most students have yet to understand the issues associated with using Generative AI in academic contexts. Even platforms focused on research ethics, like the [Tri-Council Policy Statement 2: CORE (Course on Research Ethics)](#), lack content about the ethical implications of using Generative AI. There is an emerging need to highlight these issues in all the related guidelines and platforms that promote research ethics.

I found one more area these guidelines mostly miss: ensuring academic integrity in an online learning environment. There can be two modes of teaching and learning in online courses: asynchronous web-based learning and zoom-based learning. In the Zoom-based model, instructors can interact with students and assess their learning virtually. However, gauging students' learning levels in a web-based model is challenging, particularly after the emergence of Generative AI technologies. Dalhousie University recommends using the track changes and comments features of Google Docs and Microsoft Word. Still, the guidelines need further research on the impact of Generative AI in online learning environments, especially web-based ones, where the ethical implications of these technologies are considerable.

Current policies also need clearer guidance for students regarding the use of Generative AI tools. Instead, they place the responsibility for clarity on the instructors, some of whom may be uncertain about these technologies. As these technologies continue to evolve and expand, so does the uncertainty surrounding them. Hence, guidelines must be clear for instructors and students,

and universities should regularly update their policies based on thorough research. In this regard, Luo (2024) suggests the need for empirical research on how teachers and students interpret and respond to Generative AI policies, hindering universities' ability to make informed decisions based on rigorous data.

Moreover, these guidelines cannot be static. They must evolve to keep pace with the latest developments in Generative AI. Some universities, like Simon Fraser University, host a blog on Generative AI, which enables the university community to discuss issues and uncertainties related to Generative AI. Such platforms can serve as a hub for ideas and insights, helping to update AI-related policies and guidelines.

Veletsianos (2023) makes a crucial recommendation that institutions engage in comprehensive discussions about AI's limitations, biases, and potential across disciplinary, institutional, provincial, and pan-Canadian levels while shaping ethical AI practices and envisioning preferable educational futures. Veletsianos (2023) adds that a database of AI-related regulations, policies, and guidelines should be created at a pan-Canadian level to ensure adherence to established norms.

Implications for Universities

The implications of this research for universities are significant. It highlights the need for institutions to develop or update comprehensive policies regarding the use of Generative AI tools, ensuring they promote academic integrity in a rapidly evolving technological landscape. The results advocate for fostering a culture of ethical AI usage through training programs that educate students and faculty about the risks and responsibilities associated with Generative AI.

Additionally, universities are encouraged to continuously review their academic integrity frameworks to include clear guidelines on acceptable AI use and establish penalties for violations.

This proactive approach can minimize misunderstandings and clarify the implications of AI technologies in academia.

Moreover, the research supports universities in assisting instructors with redesigning assessments that leverage Generative AI, promoting innovative teaching practices that enhance student learning outcomes. Overall, this research empowers universities to integrate Generative AI into their academic frameworks, prioritizing ethics, integrity, and innovation in education.

Implications for Instructors

The implications of this research for instructors are significant, as it provides a comprehensive understanding of institutional policies regarding Generative AI, enabling them to align their teaching methods with these expectations and promote academic integrity. Instructors can utilize insights from the study to redesign assessments that emphasize critical thinking and creativity, enhancing student engagement while reducing the risk of academic misconduct. Additionally, the findings on the acknowledgment and citation of Generative AI tools equip instructors to guide students in ethical academic practices. The research also highlights the need for ongoing professional development, encouraging instructors to seek training on the implications of Generative AI in education. Ultimately, this research empowers instructors to effectively integrate Generative AI into their courses, fostering an environment that values ethics, integrity, and innovative teaching practices.

Implications for Students

This research emphasizes the importance of academic integrity in the context of Generative AI, equipping students to understand the ethical considerations and potential issues associated with using such technologies, thereby promoting responsible usage, and reducing instances of academic

misconduct. This study's results regarding how to acknowledge and cite Generative AI tools will provide essential guidance on proper academic practices, helping students avoid plagiarism and ensure appropriate credit is given for AI contributions. Understanding the evolving landscape of Generative AI will also prepare students for future challenges in their educational and professional careers, making them more adept at leveraging AI tools responsibly and ethically. Ultimately, this research encourages critical thinking, fostering a mindset that values discernment when engaging with AI-generated content, thus empowering students to enhance their learning experience while upholding the principles of academic integrity.

Future Research

As generative AI technology is rapidly evolving, assessing the efficacy of these guidelines in ensuring academic integrity is challenging. This research only presents an analysis of the content of the selected universities' policies and guidelines. However, it could guide further research studies on the efficacy of these policies and guidelines in assisting different stakeholders, especially students and instructors, in using generative AI technologies. As this research focuses solely on Canadian universities, a potential area for further research could be comparing guidelines and policies between Canadian universities and those in other countries.

Limitations

As the data sources for this research study are documents in the form of policies, procedures, and guidelines from universities across Canada, this research would benefit from confirmation from a direct data source such as interviews. When studying how Generative AI tools impact education, academic integrity, and institutional policies, choosing to talk to instructors,

students, and policymakers through interviews can be helpful. Interviews can bring forth personal experiences and thoughts about Generative AI and its impact on academic integrity in educational settings. This differs from just looking at documents, as interviews can help reveal hidden knowledge, unspoken worries, and current feelings, making this study more focused on people. Moreover, personal interviews can generate additional insights through the researcher's active participation in gathering data about how academic integrity policies are framed and enforced in HEIs. However, a detailed document analysis of the Academic Integrity Policies and Guidelines of universities in Canada is an appropriate and effective way to achieve the research objectives. Given the scope of this research, the number of universities' policies that can be analyzed must be limited. Also, the study is limited to the information contained in the documents prepared by universities to deal with the issue of academic integrity in the era of Generative AI.

Chapter 6: Conclusion

Academic integrity entails a commitment to upholding the academic community's fundamental principles of responsibility, respect, and fairness. Many educators and the public view a perceived lack of academic integrity among students as a significant threat to educational institutions' fundamental function. Generative AI tools can potentially increase opportunities for misrepresentation and academic malpractice. Some students may misuse these tools to produce research papers, essays, and other academic assignments without proper attribution, undermining these tasks' educational value and the credibility of educational institutions. Hence, educational institutions need to establish comprehensive guidelines for the acceptable use of AI-generated content and emphasize the importance of attribution and academic integrity.

This research study analyzed top-ranking Canadian universities' Generative AI policies and guidelines. These policies and guidelines are meaningful and valuable documents formed after extensive discussions and research. A qualitative document analysis was used as the research methodology to examine the twenty selected policies, proving effective in answering the research questions on how these universities recommend instructors use AI-detection tools, redesign assessment strategies in the light of Generative AI, and how these universities recommend students cite the use of Generative AI tools. This methodology offered a timely research approach within the rapidly evolving era of Generative AI.

The themes that emerged from the research included the definition of Generative AI, examples of Generative AI tools, possible uses of Generative AI in education, ethical considerations of using Generative AI in education, and recommendations for higher education institutions, and their instructors, students, researchers, and employees. These themes help to understand the commonalities and differences among these policies and guidelines. On most topics, the guidelines had similar approaches. For example, universities have similar stances on

the use of AI-detection tools. All the universities provided recommendations for students and instructors, which were largely similar.

Due care was taken to include all important aspects and themes from all twenty policies and guidelines. The collective recommendations and themes that resulted from this research can provide the fundamental basis for an ideal and comprehensive Generative AI policy for a higher education institution. These recommendations can be further improved and modified to keep pace with the evolving field of Generative AI.

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Appendix A

Themes, Sub-Themes, and Codes

Theme	Sub-Themes	Codes	Description	Sample Quote	RQ
Definition of Generative AI according to the Studied Guidelines	-	Machine Learning, Large Language Models (LLMs), Natural Language Processing (NLP), Generate Content	Synthesis of definitions of Generative AI as provided by the universities	Generative AI is a broad term referring to a type of AI employing various machine learning algorithms to create new, unimodal (single mode - text or image, for instance) or multimodal (multiple modes - text and image, for instance) content based on human user inputs (or prompts) - UoA	RQ1
Possible Uses of Generative AI in Education	Potential Applications of Generative AI for Students	Exam Preparation, Language Learning, Grammar, Writing Skills, Preliminary Research, Assignments	Potential applications of Generative AI tools in various domains of teaching-learning by students and teachers	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. - McGill University	RQ1
	Possible Uses by Instructors	Formative-Assessment, Process-Driven Learning, Generating Academic Content			
Ethical Considerations of Using Generative AI in Education	Academic Integrity Concerns	Academic Integrity, Hard to detect, Honesty, Fairness, Academic Misconduct	Ethical Considerations involved in using Generative AI tools in academia mainly involve concerns related to academic integrity, misinformation, fabrication, biases, data privacy, critical thinking, linguistic diversity, inequitable access, and intellectual property issues.	In any educational setting, especially when utilizing third-party software not officially supported by an institution, it is crucial to consider privacy, security, and student and instructor intellectual property. These concerns are particularly relevant when implementing Generative AI tools, such as ChatGPT, for academic purposes. - University of Alberta	RQ1
	Misinformation and Disinformation	Accuracy, Misinformation, False Information			
	Fabrications/ Hallucinations	Misleading, Harmful Content, Factual Errors, Hallucination			

	Algorithm Bias	Reliability, Biasness, Stereotypes			
	Diminishing Critical Thinking	Critical thinking skills			
	Copyright Infringement and Intellectual Property Issues	Intellectual property rights, copyright infringement			
	User Data Privacy	Privacy, Data Security, Security Assessment			
	Business Practices	Labour Abuse			
	Reduces Linguistic Diversity	Homogenized Linguistic Output, Cultural Diversity, Linguistic Bias			
	Inequitable Access	Financial Cost, Bans Paid Subscriptions			
Recommendations for Higher Education Institutions	Promoting Research	Research and development, Pedagogical Applications, Collaborations	Recommendations collated from the guidelines appropriate to be adopted at the institutional level primarily include promotion of AI literacy, Research on Generative AI, Organizing Educative Sessions, and Development of Resource Modules	Commits to supporting faculty, instructors, students and staff to understand how GenAI works and to develop skills for effective and responsible use of GenAI and other digital tools through workshops, podcasts and toolkits offered by the Division of Learning and Teaching Support and Innovation. - University of Victoria	RQ1
	Establishment of Dedicated Task Forces	Taskforces			
	Fostering AI Literacy	AI Literacy, Education and Awareness Program			
	Providing Pedagogical Support	Dialogue, Discipline-Specific Guidelines			

	Development of Resource Modules	Resource Module, Learning Module, External Resources		New and ongoing education for faculty is very important here, yet there is a need and desire in this area for continuous programming, such as workshops and boot camps in tandem with one-time offerings. Faculty and students need to continue to learn and keep learning here as we go: we all really are in this together, and we need ongoing conversations separately and together. At the basic level, information sessions for faculty and graduate students are an integral starting place for developing capacity and stamina with our AI literacies. - University of Alberta	
	Organizing Educative Sessions	Educative Sessions, Workshops, Facilitated Discussions			
	Inclusion in Administration	Automation in Administrative Tasks, Data Management, Timetabling, Resource Allocation			
	Principles of Academic AI Use	McGill University Five Principles, Autonomy to Instructors			
Recommendations for Instructors	Embracing Experimentation with Generative AI in Educational Settings	Explore, Experimentation, Prompt Engineering	Recommendations suggested in the guidelines for the instructors to leverage the Generative AI technologies without compromising the integrity of the teaching-learning process	Instructors are welcome and encouraged to test ChatGPT, which is currently free upon registration. You can also test other similar AI tools to assess their capability, for instance, to see if they can respond to the assignments used in your courses or the way in which they improve the readability and grammar of a paragraph. Experimentation is also useful to assess the limits of the tool. - University of Ottawa	RQ2, RQ3
	Communicating Expectations with Students	Clear expectations, Explicit Instructions			
	Clarity in Syllabi Statements and Course Outlines	Transparent Sample Syllabi, Advise Students		When considering whether to incorporate generative AI tools into a course, instructors need to start by determining whether these types of tools align with the course learning outcomes. Learning outcomes should guide the knowledge and skills students will gain from the course and help	
	Ensuring Equitable Access	Digital Divide, Free Access, Paid Version, Opt-out Option			

				determine types and approaches to assessments. - Carleton University	
	Teaching About Generative AI	Key AI terms and concepts, Discussions on AI		Concordia's optimal strategy is to assist instructors in understanding the quickly evolving nature of GenAI in order that they may make informed decisions about its use in their classes. Above all else, it is essential that professors dedicate time to articulating their positions on GenAI clearly within the classroom, on Moodle sites, and in syllabi. - Concordia University	
	Pedagogical Uses of Generative AI/Teaching with Generative AI	Content Creation, Gamification, Research, Not submitting student work to AI tools			
	Use Of AI-Detectors	AI-content Detection, AI Detectors, Security and Privacy Review, Reliability Enforcement, Self-Compliance		Instructors should indicate if this technology can be used in a course and, if so, what the parameters of its use will be. Generative AI has distinct impacts on course assessment practices. Instructors have the most immediate sense of the potential impacts on their courses, and they are best placed to make key decisions about whether generative AI fits with their learning outcomes. It is essential, then, that instructors speak to their classes about their perspectives on generative AI and detail the conditions for its use in their courses. - Queen's University	
	Assessment Redesign	AI-proof assignments, Staged Submissions, In-Class Activities Oral Assessment, Integrating AI in Classroom, Personal Reflection and Experiences, Discussions, Presentations, Situational Questions, Labour-based grading scheme, Experiential Learning, Multimodal Assessment			

Recommendations for Students	Exploration/ Experimentation with Emerging Technologies	Explore, Experiment, Brainstorm	Recommendations suggested in the guidelines for the students in their ethical use of Generative AI tools and technologies	Proper citation is critical for engaging in ethical scholarly practices. It demonstrates that you are joining a larger scholarly conversation and acknowledging the ideas and information that your work connects to. It also helps other researchers see where your information and thinking comes from. -University of Waterloo	NA
	Citation, Acknowledgement, and Documentation of AI-generated Content	Citation of AI tools, Acknowledgement Reflective Summary, Documentation			RQ4
Recommendations for Researchers	-	Generative AI in doctoral research and thesis writing, AI as co-author	Recommendations suggested in the guidelines for researchers	Researchers, including graduate students, must exercise caution in using generative AI tools, because some uses may infringe on copyright or other intellectual property protections. - University of Toronto	NA
Recommendations for Employees	-	AI for Employees, Administrative Functions	Recommendations suggested in the guidelines for the employees	Western trusts the community to innovate and experiment with generative AI responsibly and ethically. Employees must respect Western's existing policies and think carefully about privacy. - Western University	NA

Appendix B - Coding Matrix

The Xs in the cells represent the detection of that theme within the case.

Theme	Sub-Themes	U1-TORONTO	U2-UBC	U3-MCGILL	U4-MCMASTER	U5-ALBERTA	U6-WATERLOO	U7-OTTAWA	U8-CALGARY	U9-WESTERN	U10-QUEEN'S	U11-SIMON FRASER	U12-DALHOUSIE	U13-MANITOBA	U14-SASKATCHEWAN	U15-YORK	U16-VICTORIA	U17-GUELPH	U18-CONCORDIA	U19-CARLETON	U20-MUN
Definition of Generative AI according to the Studied Guidelines	-		X	X	X	X	X	X	X	X	X		X	X	X	X	X		X		X
Possible Uses of Generative AI in Education	Potential Applications of Generative AI for Students	X		X		X	X				X				X					X	X
	Possible Uses by Instructors	X		X	X	X	X				X										X
Ethical Considerations of Using Generative AI in Education	Academic Integrity Concerns	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Misinformation and Disinformation				X	X		X			X										
	Fabrications/Hallucinations		X		X	X		X											X		

	Algorithm Bias		X	X	X	X	X		X	X		X			X			X	
	Diminishing Critical Thinking				X		X			X									
	Copyright Infringement and Intellectual Property Issues	X	X	X	X	X				X			X		X			X	
	User Data Privacy	X	X	X	X	X			X	X		X	X	X	X			X	
	Business Practices			X		X												X	
	Reduces Linguistic Diversity					X	X												
	Inequitable Access			X	X													X	
Recommendations for Higher Education Institutions	Promoting Research						X												
	Establishment of Dedicated Task Forces			X	X														
	Fostering AI Literacy	X		X		X		X		X		X	X			X	X	X	X
	Providing Pedagogical Support			X	X	X		X		X			X	X			X		
	Development of Resource Modules			X						X									

	Organizing Educative Sessions				X													X		
	Inclusion in Administration			X					X											
	Principles of Academic AI Use			X					X											
Recommendations for Instructors	Embracing Experimentation with Generative AI in Educational Settings	X		X	X	X		X		X	X		X	X	X	X	X		X	X
	Communicating Expectations with Students	X		X	X	X		X			X	X	X	X	X	X	X	X	X	X
	Clarity in Syllabi Statements and Course Outlines	X	X	X	X	X					X	X	X	X	X	X	X		X	X
	Ensuring Equitable Access				X	X		X			X									
	Teaching About Generative AI				X						X							X	X	
	Pedagogical Uses of Generative AI/Teaching with Generative AI	X		X		X		X			X		X			X			X	

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		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Use Of AI-Detectors	X	X	X	X	X		X		X	X		X	X	X	X		X	X	X	X
	Assessment Redesign	X		X	X	X		X		X		X	X	X	X	X		X	X		
Recommendations for Students	Exploration/Experimentation with Emerging Technologies	X		X		X	X		X	X	X	X	X	X	X	X	X			X	
	Citation, Acknowledgement, and Documentation of AI-generated Content	X	X		X	X	X		X		X	X	X	X	X			X	X	X	
Recommendations for Researchers	-	X					X	X	X	X											
Recommendations for Employees	-	X								X											