Generative Artificial Intelligence in Canadian Post-Secondary Education: AI Policies, Possibilities, Realities, and Futures

2023 Special Topics Report

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We thank D2L for their sponsorship of the 2023 Special Topics Report on Generative Artificial Intelligence in Canadian Post-Secondary Education.

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ACKNOWLEDGEMENTS

The CDLRA's research initiatives are made possible with the support of our sponsors and partners. The primary funding agencies for the 2023 Pan-Canadian Digital Learning Surveys were BCcampus, D2L, Campus Manitoba, Contact North, eCampusOntario, the Maritime Provinces Higher Education Commission, and the Québec Ministry of Education. We also thank our partner organizations, Bay View Analytics, Academica Group, and WCET, for their support.

In addition, we acknowledge the work of the CDLRA research team, Dr. Nicole Johnson (Executive Director, Co-Director of Research, and Pan-Canadian Digital Learning Survey project lead), Dr. George Veletsianos (Co-Director of Research) and Dr. Jeff Seaman (Director of Analytics), along with the support of the individuals who served on CDLRA's Board of Directors in 2023 (Dr. Nicole Johnson, Dr. Stephanie McKeown, Cathy Newell-Kelly, Dr. Bruno Poëllhuber, and Dr. George Veletsianos).

We offer our gratitude to Alison Seaweed, from the Kwakiutl First Nation, who provided feedback on our 2023 surveys from an Indigenous perspective to help support the CDLRA in our efforts to begin decolonizing our work. The CDLRA acknowledges that, as a remote team, we live and work in many different locations on lands taken from Indigenous peoples. As a team, we seek to better understand the ongoing impacts of colonial systems and structures, particularly within the Canadian post-secondary education sector.

We thank the many people who have met with our team to discuss possible survey topics, to give feedback on our findings, and to share insights from the field. These perspectives have been critical in shaping our research initiatives.

We also thank the CDLRA team members and contractors who perform the tasks that support our day-to-day operations and our ability to conduct our research studies.

Most importantly, we thank our survey respondents.

EXECUTIVE SUMMARY

The *Pan-Canadian Digital Learning Survey* conducted by the Canadian Digital Learning Research Association in Spring 2023 received responses from 438 administrators and faculty members, located at 126 unique institutions across Canada.

This report examines faculty member and administrator perspectives on Generative Artificial Intelligence (AI), which is a technology popularized by ChatGPT that uses machine learning to process data and produce new content, including audio, code, images, text, simulations, and videos.

Findings indicate that,

1. The development of policies, regulations, and guidelines relating to Artificial Intelligence at Canadian institutions of higher education is at an early stage.
2. Faculty members and administrators express varying levels of optimism, concern, and uncertainty about AI.
3. Use of AI appears to be ad hoc, uneven, unequal, experimental, and largely guided by individual faculty, while supported by some institution-wide initiatives such as workshops and working groups.
4. Faculty members and administrators
    a. anticipate AI becoming a normal and common part of higher education.
    b. emphasize that its value depends on numerous factors.
    c. anticipate that it may lead to further questions around the cost of education.
    d. are concerned about the biases and limitations of AI, including the potential dystopic futures that it makes possible.

Recommendations include the following:

1. At the institutional level, leaders should further publicize the institutional stance, guidance, and/or policies to faculty members and administrators. Such guidance would be most useful if it supported faculty, staff, and administrators in learning about and experimenting with the technology, rather than controlling and penalizing its use.
2. At the institutional level, leaders should develop plans and initiatives around AI that account for institutional and disciplinary contexts, including ways in which the institution will support effective, creative, equitable, and responsible use/nonuse.
3. At the disciplinary, institutional, provincial, and pan-Canadian level, continue engaging in conversations around the limitations and biases of AI, and seek ways to engage with AI designers and developers in order to pro-actively impact the future of this technology.
4. At the disciplinary, departmental, and institutional level, continue engaging in conversations that address the question “What does ethical AI practice look like?”
5. At the institutional, provincial, and pan-Canadian level, continue engaging in conversations that center the question “What do preferable education futures look like?” that account for the emergence of AI, as well as the myriad of other challenges that higher education is facing.
6. At the pan-Canadian level, develop a database of institutional regulations, policies, and guidelines pertaining to AI.

INTRODUCTION

The Canadian Digital Learning Research Association (CDLRA) conducted the Spring *2023 Pan-Canadian Digital Learning Survey* to explore critical issues in digital learning at publicly funded post-secondary institutions in Canada (see methodology section for the sample and research methodology used in the survey).

The primary objective of the research was to provide institutional leaders and key interest groups in Canadian higher education with valuable information as they develop institutional strategies.

This report analyzes the responses to the set of survey questions that focused on Generative Artificial Intelligence (AI). Generative AI is a technology which uses machine learning to process data and produce new content, including audio, code, images, text, simulations, and videos.

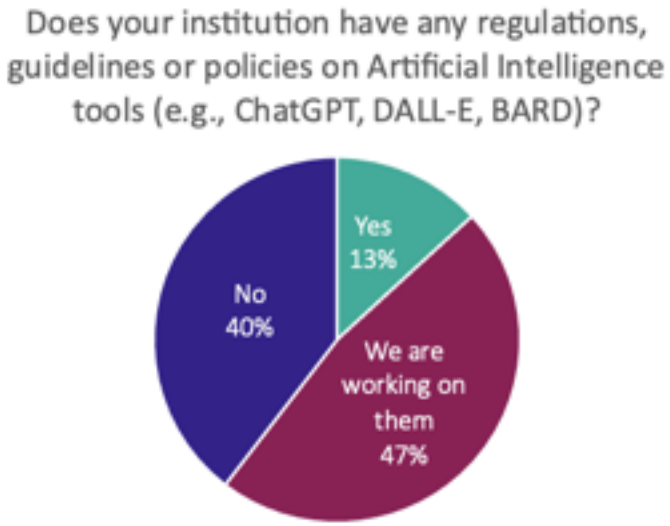
The report is divided into five sections:

- Institutional policies, regulations, and guidelines related to AI.
- Faculty and administrator perspectives on the potential of AI in education (i.e. state of the possible).
- Use of AI in practice (i.e. state of the actual).
- Speculative futures relating to AI.
- Recommendations.

AI POLICIES, REGULATIONS, AND GUIDELINES

Participants were asked whether their institution has established any regulations, guidelines or policies pertaining to Artificial Intelligence tools. Of 425 participants who responded to this question, 101 reported that they were unaware whether their institution had created any such principles of action. The remaining 324 responses were divided in two groups: a clear picture group and a blurry picture group.

The clear picture group included 146 participants representing 91 institutions. This group included individuals who were either the sole respondents at their institution, or multiple individuals at the same institution who provided the same response to the survey question around the existence of AI policies, regulations, and guidelines at their institution. As shown in the chart below, of these 91 institutions, the ones that have provided guiding principles are in the minority (13%). Forty percent do not have any guidance, and forty-seven percent are working towards developing guiding principles.



While this chart may suggest a clear view of the current state of institutional guidance around AI, it only tells half the story. The blurry picture group consists of 138 respondents from 34 institutions. These responses were grouped together they represented respondents from the same institution who provided conflicting answers (e.g., one person noting the existence of a policy while a second noting that no such policy is in place). While these responses complicate the quantitative analysis, they are informative because they are indicative of:

- The newness and emerging nature of AI policymaking at Canadian institutions of higher education.
- The possibility that policies and guidance at some institutions may not have had time yet to be propagated to everyone.
- The likelihood that confusion exists within institutions as to the existence of AI policy and guidelines.

In responses to follow-up open-ended questions, participants noted the need for institutional guidance regarding the use of AI tools. What such guidance looks like will vary from institution to institution. One respondent for example noted that "academic Integrity policy is essentially decentralized at [my university], meaning it is up to the discretion of faculty members to indicate in their course syllabi what is permissible, and [a relevant university office] has provided sample syllabus statements that faculty members are free to use or adapt as they like." At other institutions, guidelines came such places as the Library, the Writing Centre, and the Centre for Teaching and Educational Technology.

This is not to say that all institutions ought to have a formal policy or that a formal policy is necessarily a good development at this stage. For example, the data reveal that at some institutions, formal policies and guidelines are not currently pursued. For instance, one administrator reports that their institution is "not creating separate policies or regulations for AI," which follows the same path described by an administrator at their own institution: "rather than developing policies we have been working to support faculty to understand how to incorporate AI into programming and assignments and how to develop authentic assessments."

THE STATE OF THE POSSIBLE[1]

When participants were asked to offer their reflections on the potential of AI, the prevailing sentiment in the data was that AI is here to stay and that universities must adjust to this change. Participants expressed varying levels of optimism, concern, and uncertainty.

Many participants expressed optimism about AI's potential. They indicated that AI tools can be used to enhance teaching and learning, improve efficiencies, and offer new opportunities for students and instructors. For instance, one participant noted that AI "might be used for tutorials, critical analysis (i.e. analyze results of a GPT query), writing improvement/analysis, etc." while another noted that "for essay and project-based courses there will be a greater opportunity to focus on the communication of work rather than the generation of the content."

Such a development would require a shift in pedagogical and assessment practices. On one end of the spectrum, participants noted that teaching and assessment might shift by emphasizing critical thinking, research skills, and reflective thinking. For example, one participant noted that the presence of AI makes it "vital to create assignments that require significant reflective thought, with evidence of process along the way, not just final product assessment," which was echoed by a second participant who said "the nature of some assignments should change to align with the fact that the AI is here... It makes no sense to forbid it." On the other end of the spectrum, a few participants noted that assessment might need to shift towards ways that mitigate the likelihood of AI being used for cheating, such as for example shifting assessments towards in-person testing.

Finally, a few participants noted that they are "uncertain about AI's full potential and ramifications" and suggested a need for more information and critical discourse, especially around the technology's limitations such as "lack of transparency around the source material, training corpus bias, data privacy issues for users." For this reason, several participants noted that their institutions are approaching AI cautiously. For example, one institutional leader noted that they are "encouraging creative, responsible, and ethical use of the tools" while another noted that their institution is encouraging a "user-centered care-based, ethical approach to decision making around AI."

[1] The headings "state of the possible" and "state of the actual" were inspired by Neil Selwyn's (2010) looking beyond learning: notes towards the critical study of educational technology. In that paper, he contrasts 'state-of-the-art' which addresses "what *could* happen and what *should* happen once the latest technologies and digital media are placed into educational settings" with 'state-of-the-actual' which focuses on "what is *actually* taking place when a digital technology meets an educational setting."

THE STATE OF THE ACTUAL

While there is much conversation about the potential of AI in education, it is also necessary to understand the ways in which AI is used on the ground, in actual practice.

A thematic analysis of the data suggests that the use of AI tools at Canadian institutions of higher education is unclear, emerging, and uneven both within and between institutions. For instance, participants described how "individual professors/instructors span the full spectrum of interest and usage around AI tools for teaching and learning" with "many using AI for a range of innovative teaching & learning activities, while many want nothing to do with it and treat student usage of AI punitively." There is also lack of clarity around student use and prevalence, and information around use appears anecdotal, as aptly illustrated by a participant who wrote "there is a high probability that students are using these tools to assist with schoolwork, however, there is no 100% certainty that this is occurring."

One participant described use at their institution as "ad hoc; people decide themselves if and how to use" and another noted that they're "not sure how much AI tools are being used beyond experimentation at the individual level amongst faculty and staff." Another participant noted that "faculty's use of ChatGPT is uneven on our campus" while another noted that "some faculty are doing it as a part of their own personal research."

Numerous participants noted that their institutions are unprepared to deal with AI. However, numerous others highlighted ways in which institutions support individual faculty and staff efforts through institution-wide initiatives such as:

- *"information sessions and guidelines for managing ChatGPT in various learning environments and how to include direction in course syllabi and alignment with plagiarism regulations"*
- *"a working group dedicated to researching best practices on the use of AI tools in the classroom, including education on AI tool use for our students. This information is also being shared across schools and is being used to inform and develop faculty and staff training through our [Centre for Teaching and Learning]."*
- *"symposia and workshops on AI... [and] encouraging faculty to be curious about the tools rather than blanket bans."*

Much of the use described is experimental. For example, one individual noted that "students, staff, and faculty are in the process of figuring out how those tools might be useful and appropriately employed in an academic/research environment" while another noted that AI tools are used "experimentally to generate a variety of documents (e.g., draft job description, draft course outline)." Given the emergent nature of these tools, much of the evidence presented by participants is anecdotal, illustrated aptly by the following quote:

> *"I'm not sure how much AI tools are being used beyond experimentation at the individual level amongst faculty and staff, about which I am hearing lots (anecdotally) - using it to create documentation, draft writing, create assessments, etc."*

When participants described actual usage, such usage largely focused on supporting instruction, including the development of content, activities, rubrics, and assessments. Responses indicative of these practices include the following:

- Faculty are using these tools to assist with content creation such as lesson plans, learning outcomes, and question creation.
- Some educators are using Large Language Model tools to help create drafts of lesson plans and learning outcomes. Some are also encouraging students to use these tools as an "expert on the side" to proof student work before it gets handed in. One example is to have students write the code for an assignment, then get the AI to write the code as well, and then the student compares the two to see what the student can improve and what the AI got wrong.
- Some faculty members have students analyze/assess ChatGPT responses to questions in order to assess their strengths, weaknesses, and accuracy. Others have students analyze code written by ChatGPT.
- Some instructors are using it in their courses (1) as a mode of adaptive learning, (2) to provide personalized response to students, (3) as an aid to student writing or (4) as a topic of study.
- Some instructors are using it to generate content, rubrics, and communications. I've personally used it to develop fictional case studies and learning scenarios.

It is important to note that fewer participants contributed comments relating to this section about actual use that any other section of the report. Fifty-nine individuals contributed to this section compared to 138 respondents who commented on the *state of the possible* section and 245 respondents who commented on the *artificial intelligence futures* section. While this may be reflective of the methodological approach taken, it may also be indicative of a lack of awareness or low patterns of use at this point in time.

ARTIFICIAL INTELLIGENCE FUTURES

Speculative methodologies are approaches used to consider and investigate topics relating to education futures. As such, they are amendable to exploring the ways in which artificial intelligence (And other educational technologies) might or might not be integrated in future learning environments. Such methodologies take different forms. The CDLRA survey included the following speculative prompt:

> *"Imagine that the year is 2033, ten years into the future. Olivia is enrolled in a course in which instruction is shared between the human instructor and an artificial intelligence bot. For example, the bot might make recommendations for course readings and discussion prompts or might assign extra work to Olivia based on her progress in the course. How does Olivia feel about the involvement of the artificial intelligence bot in her education?"*

The power of speculative methodologies (and prompts like the one above) lie on the fact that our thinking about the future is indicative of current realities, concerns, anxieties, and hopes. In other words, while the prompt focuses on Olivia, and participants described Olivia's feelings as ranging from disheartened and discouraged to excited and appreciative, its intent is to reveal ways in which faculty members and administrators think about AI in education. A thematic analysis of the responses revealed four themes: (1) normal and commonplace, (2) the value of AI integration depends on numerous factors, (3) cost of education, and (4) "what a dystopia."

NORMAL AND COMMONPLACE

Most participants considered this future to be an inevitability and described it as normal, commonplace, or unspectacular. As one participant put it "by 2033 AI will be common, normal and used in many aspects of society, [and as such] it will be viewed as the norm by Olivia." Another noted that by then, "AI assistance will become ubiquitous in higher education and society in general," while a third said that "Olivia would know no different - only her parents remember a time when this was not completely normal." Comments categorized under this theme also noted that AI integration in education will be so common that Olivia may not notice or "give a second thought" that an AI is involved in co-teaching this course. Examples of such comments included the following:

> *"Olivia…may not even label it as 'artificial intelligence' involvement; It may just be the way things are."*

> *"She is completely comfortable with this and may not even recognize that there is an AI bot in the course."*

One participant had this to say:

> *"Learning with an AI bot in 2033 has become normalized; Olivia has been doing so for several years even before entering university. She knows the capabilities and limitations of the bot, and understands what she can/should not rely on it for. She has enough agency and capacity to critique its output and advice when needed based on her understanding of its operation and potential biases, or to ask for help in doing so from her human instructors. She treats the bot as a resource, but not a teacher, just like a textbook."*

What this quote reveals is that "normal" and "commonplace" do not necessarily mean an indiscriminating acceptance of AI use in education. For this, we turn to the next theme in the data.

THE VALUE OF AI INTEGRATION DEPENDS ON NUMEROUS FACTORS

Most participant comments emphasized that there's a need to understand how to use such tools ethically and effectively, and state that whether Olivia finds value in the bot will depend on a variety of factors. Some of those factors included the instructional and technical quality of the AI bot; the instructor's investment in Olivia's education; the amount of support that the institution provides to Olivia and her instructor; and the ways in which Olivia, her instructor, her institution, and society at large come to understand the use of AI tools. For example, one participant noted:

> *"This will depend on how she has come to understand the role of AI. If she sees it as a source of "knowledge" then she will happily accept it as unproblematic, her worldview will be limited and she will increasingly see the professor as "making things too complicated" and unnecessary to the process; or, if she develops some sense that there is more to it but the university is only providing half a professor and just giving her computer generated simulation as half her education, she will become increasingly cynical about education itself as useless information sharing. If, however, she sees it as a tool for some forms of information (among other tools and ways of knowing, including indigenous ways, etc.) and is able to critically assess AIs role, then it could be integrated into her education in a more limited and useful way and she will be able to more clearly and critically assess knowledge, truth, wisdom, insight etc. as she leaves university."*

Two factors that appeared frequently in the data are the role of the bot and the larger concerns around AI that require further investigation.

First, participants noted the role of the bot is-a-vis the role of the instructor. Participants emphasized that there is value in this scenario so long this technology is not displacing human interactions and the value that human instructors bring to education. It is worthwhile to note that the concern here was largely about education rather than educators' employment, illustrated in quotes such as "as long as it is seen as a complimentary tool and not a replacement for human interaction" and "if this method is used in combination with traditional methods that have worked (e.g., pedagogy and affect, sensorial relations, life experience of students and teachers) then the bot will be another tool like the laptop, cell, telephone, car, etc." In reflecting upon the relationship between Olivia, her instructor, and the bot, participants often expressed hope that the bot will act in a supplementary and supportive role. For example, one participant said: "Hopefully Olivia gets a lot of meaningful time with her human instructor, so she benefits from the time that AI frees up for the human instructor" while another noted that the presence of an AI bot that takes on instructional tasks would ideally "reinforce the value of [Olivia's] interactions with her course professor." In short, while participants noted that Olivia would likely appreciate the AI bot providing prompt, reliable, and personalized recommendations, the bot "could not come at the expense or interfere with the things Olivia values such as personal interaction with her instructor," the "real-world experiences [instructors] share in their teaching," and the "strong relationship[s] with their human instructor who would support them as they navigate their deeper learning and make connections to create new knowledge."

Second, participants noted critical issues that need addressing. Even if this is a normal and natural development of what a potential future may look like, participants identified a number of issues of broader concern that make them apprehensive. While some of these concerns were educational (e.g., inequity gaps, who has access to these technologies vs who receives greater human attention), participants also noted the broader social, political, economic, and environmental concerns of these technologies. For example, one participant noted that "the larger concern should be the environmental and economic costs of such technologies, and who is paying for them," while another said:

> *"[While] Olivia won't really notice or care, because it will be so normalized, I am concerned about the tendency of AI to be skewed by data sources that are politically and socially problematic. I'm concerned about AI learning racism, sexism, and ableism and perpetuating those beliefs, unchecked."*

Concerns about the biases inherent in AI tools led participants to encourage skepticism and further reflection. Two quotes that illustrate these critical and far-reaching issues are included below:

> *"I think it will depend on whether or not Olivia, as a student, has been involved in discussions about the role that AI should/could play and whether she has choice. She may have concerns about how the AI was built (whose labour, whether it was extractive or exploitative, whose knowledge was given preference, where that knowledge came from, et cetera), whether or not the implicit bias that is encountered in AI has been addressed, and what the purpose of the AI help might be (again whose goals is it serving? Olivia's? Or an institution which may want to nudge her towards different kinds of courses which may serve their own (or government's goals or perspectives on productivity) purposes? I can see a time where AI is used to make decisions (as learning analytics are now) about how a student should study and what value certain courses/programs might have - and that is troubling."*

> *"Olivia's perception in 10 years will] depend immensely on how people view AI and bots. Are they going to be considered mindless automatons (in which case why go to a university when there will be dozens of bots who can do the same thing for free) or will they be highly specialized and trained and given a measure of respect and standing (i.e. will we recognize intelligence and training in bots)?"*

COST OF EDUCATION

Some participants noted that the integration of AI technologies in the way described raises questions about the cost of education. For instance, one participant noted that Olivia "may complain about fees and argue that her fees should be lower if her human instructor is spending less time teaching her." Another stated that Olivia will push back because "she feels that she paid good money for human interaction." A third cautions that this will be especially true "If [Olivia] sees the machine as a replacement for the instructor, [in which case] she will resent spending a lot of money on education." Another participant further clarified that while Olivia might have "no issues with the bot" she might "harbour resentment towards the humans who are still charging her exorbitant tuition to interact with a bot. Even though two participants noted that use of the bot might translate to cheaper tuition, by and large the data coalesced around the following question asked by one participant: "Why is she paying so much tuition to be taught, even in part, by a bot?" Might students be willing to "accept this scenario," another asked, "if it led to significantly lower tuition with no decrease in quality?"

"WHAT A DYSTOPIA."

A few participants described this scenario as dystopic, "cold and uncaring," noting their concern not just for Olivia the fictitious character, but for themselves and their children if this future became a reality. One participant described the scenario as a "terrifying thought" while another said: "If Olivia was me, I would HATE every single thing about the bot. If Olivia was my kid, I would move her to an institution with humans." A third, agreed: "I hope she has the sense to leave." Two participants expressed their fear that Olivia might not question what the AI provides to her, leading to "a world [that] is a little or a lot worse for it, depending on who is running that AI bot. She has no idea how to do research without that bot, and possibly no way of doing research without that bot." Summarizing such concerns, a final participant noted:

> *"Disconnected, cheapened, and likely to leave because who wants to work for a bot? This situation would clearly be done so that the human instructor can teach more classes, have fewer instructors employed at the institution, and further disaffect students from community and real-world engagement, damaging culture, democracy, and society as a whole. What a dystopia."*

RECOMMENDATIONS

Grounded on these results, I offer the following recommendations,

1. At the institutional level, leaders should further publicize the institutional stance, guidance, and/or policies to faculty members and administrators. Such guidance would be most useful if it supported faculty, staff, and administrators in learning about and experimenting with the technology, rather than controlling and penalizing its use.
2. At the institutional level, leaders should develop plans and initiatives around AI that account for institutional and disciplinary contexts, including ways in which the institution will support effective, creative, equitable, and responsible use/nonuse.
3. At the disciplinary, institutional, provincial, and pan-Canadian level, continue engaging in conversations around the limitations and biases of AI, and seek ways to engage with AI designers and developers in order to pro-actively impact the future of this technology.
4. At the disciplinary, departmental, and institutional level, continue engaging in conversations that address the question “What does ethical AI practice look like?”
5. At the institutional, provincial, and pan-Canadian level, continue engaging in conversations that center the question “What do preferable education futures look like?” that account for the emergence of AI, as well as the myriad of other challenges that higher education is facing.
6. At the pan-Canadian level, develop a database of institutional regulations, policies, and guidelines pertaining to AI.

METHODOLOGY

Information for this report comes from the 2023 Spring Pan-Canadian Digital Learning Survey which was open to participants from May 1 to June 30, 2023. The universe of interest for the 2023 Spring survey consists of all publicly-funded post-secondary institutions in Canada. Almost all universities in Canada are funded provincially.

Institutions that are not included in the roster include Canadian private for-profit universities, most of which are very small and fully private career colleges and institutes.

The 2023 Spring roster included:

- 82 universities (including Francophone colleges of Anglophone universities)
- 80 colleges outside Québec
- 51 CEGEPs
- 21 private subsidized colleges in Québec

438 individuals responded to the survey, of which 394 provided responses in English and 44 in French. Participants indicated that they were located at 126 unique institutions across Canada. They came from all provinces and territories except for Nunavut. Specifically, participants were in New Brunswick (105), Nova Scotia (99), British Columbia (68), Ontario (66), Quebec (38), Prince Edward Island (20), Alberta (18), Saskatchewan (10), Manitoba (9), Newfoundland and Labrador (2), Yukon (2), and the Northwest Territories (1).

37% of participants indicated that they were faculty members, and nearly 63% indicated that they were administrators, with such roles as teaching and learning leaders, senior administrator, educational developer, and other administrator. Nearly 96% of faculty members participants reported that they had taught in the past 12 months. Approximately 33% of administrators also reported that they had taught in the past 12 months, giving them the dual view of both administrator and instructor.

The section *State of the Possible* is informed by 138 individual responses (81 faculty members, 57 administrators) to the question: *What is your opinion on the potential for the use of Artificial Intelligence tools (e.g., ChatGPT, DALL-E, BARD, etc.) at your institution?*

The section *State of the Actual* is informed by 59 individual responses (2 faculty, 57 administrators) to the question: *In what ways, if any, are Artificial Intelligence tools (e.g., ChatGPT, DALL-E, BARD, etc.) being used at your institution?*

The section *AI futures* is informed by 245 responses (98 faculty members and 147 administrators) to the following scenario: *Imagine that the year is 2033, ten years into the future. Olivia is enrolled in a course in which instruction is shared between the human instructor and an artificial intelligence bot. For example, the bot might make recommendations for course readings and discussion prompts or might assign extra work to Olivia based on her progress in the course. How does Olivia feel about the involvement of the artificial intelligence bot in her education?*

Pan-Canadian Survey

The CDLRA research team designed the questionnaire based on prior CDLRA surveys from 2017 to 2022. Potential respondents on the roster received an email invitation to participate in the survey. Each survey invitation included a link to the online survey form. The outreach email and questionnaire content were identical in both the English and French versions. The link to the survey was also shared on the CDLRA's social media channels and included in CDLRA sponsor and partners email newsletters and social media posts.

The survey included a total of 20 questions, 14 of which were displayed to all respondents. Of the remaining six questions, three were displayed to respondents who indicated they had taught over the past 12 months, and three were displayed to respondents who indicated they had not taught over the past 12 months.

Several questions had a potential follow-up, which were only displayed if the respondent made specific choices to the primary question. The survey also included three optional open-ended questions, where respondents were invited to provide an in-depth response.

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