Teaching Innovation Incubator Report: Impacts and Implications of Inaccessibility in Postsecondary Institutions

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The University of Waterloo recognizes the many barriers and inequities that students with disabilities (SwDs) face in their education. This report aims to highlight some of the general barriers that SwDs face in postsecondary institutions, followed by specific reference to Waterloo, and finishes by discussing the need for continued efforts towards accessibility, all supported by the literature in this area.

While the experiences of SwDs are not homogenous, for the purposes of this report we will define a SwD as a student who has mental-health related, cognitive, physical, and/or sensory needs (Leanage & Arim, 2024).

Waterloo's Accessibility Landscape

a. Current State of Accessibility at Waterloo

Waterloo recognizes the need to create an accessible learning environment on top of the academic rigor and excellence it prides itself upon, which is why Waterloo is now more than ever striving to create a culture of diversity and inclusivity on campus. This is evidenced by the formation of Waterloo's <u>Disability Inclusion Steering Committee</u>, which follows the Postsecondary Education Standards¹ recommended by the Accessibility for Ontarians with Disabilities Act (AODA). This committee has reviewed matters of accessibility at Waterloo and developed strategic plans to address existing barriers that limit access to and participation in the educational services Waterloo offers. They are spearheading accessibility infusion to beyond mere compliance to standards, instead elevating intersectionality and community (nothing about us without us).

More recently, Waterloo has highlighted and acknowledged the work needed to achieve inclusivity through the establishment of the Teaching Innovation Incubator's <u>Accessible Education Project</u>, which prioritizes accessibility in teaching and learning at Waterloo and is currently working towards placing accessibility and disability inclusion at the forefront of the work done at Waterloo.

b. Vision for Accessible Education at Waterloo: Waterloo at 100

Waterloo at 100² envisions what Waterloo will look like at its 100th anniversary in 2057. Part of this vision involves building up future leaders who will use their skills acquired during their time at Waterloo to create equitable and sustainable solutions for their community. Waterloo also aspires to foster a campus environment where everyone can thrive, regardless of abilities, backgrounds, and identities. Waterloo recognizes its need to embrace new ways of doing things to improve the quality, flexibility, and accessibility of its teaching and broader educational experiences, such as co-op, exchange programs, and serving the community.

¹ The AODA's <u>Postsecondary Education Standards</u> sets out a series of recommendations of accessibility standards in PSEs. Generated based on joint efforts from those with lived experiences and experts in the field, these recommendations identify barriers that SwDs face and what needs to be done to remove and prevent these barriers in Ontario's publicly funded PSEs.

² Waterloo at 100 is a strategic plan published in 2022 which lays out the vision for where the University of Waterloo wants to be at its 100th anniversary in 2057. Taken from the input of the University community and based on founding values, this report envisions how Waterloo will continue to maintain its reputation yet also build a better future using values of boldness and unconventionality.

c. Vision for Accessible Education at Waterloo: Multi-Year Accessibility Plan

Waterloo's Multi-Year Accessibility Plan (MYAP) 2023-2025³ lays out the vision for accessibility at Waterloo by 2025: to place accessibility as at the core of university operations, rather than an added-on consideration. The MYAP also reports the progress that has been achieved since the last MYAP and lays out the further actionable steps it must take to make our institution more accessible, such as the integration of universal design into all facets of the university – such as policy, education, employment, and public space design.

General State of Accessibility at Postsecondary Institutions

There are many educational inequities that SwDs face in postsecondary education (PSE; which encompasses trade school, college, and university) (Leanage & Arim, 2024). For example, SwDs may face physical inaccessibility, unmet accommodation needs, and stigma around their disability (Furrie, 2017).

The following sections highlight the experiences of SwDs in the classroom and instructors' experiences in teaching SwDs, addressing the barriers and experiences that SwDs face in their academic environment.

a. Student Experiences

To understand how inaccessibility in PSE institutions has impacted SwDs, we must look to the insights and lived experiences of navigating PSE with a disability from students themselves.

A SwD faces additional difficulties that impact their success in their PSE journey compared to the general student body. For example, a large proportion (40%+) of SwDs reported their disability influencing their choice of courses and career, leading to a reduced course load, and/or taking longer to achieve their current education level (Furrie, 2017). A moderate proportion (20%+) of SwD reported their disability changing their course of studies, interrupting their studies for long periods of time, and/or creating additional expenses for their education (Furrie, 2017).

³ Waterloo's <u>Multi-Year Accessibility Plan 2023-2025</u> provides updates on progress since the MYAP 2018-2022 and provides a three-year bridge plan to ensure the completion of all accessibility projects and initiatives which incorporate the recommendations proposed by the AODA.

There can be many reasons for these additional challenges. In part, it could be due to a lack of proper support for SwDs, such as too few offerings of online courses (Fujita et al., 2023). One qualitative study conducted in the United States investigated the college decision-making process (the factors they considered when choosing an institution to enroll in) of SwDs currently enrolled in an American college and found that SwDs an availability of online classes influenced their decision (Fujita et al., 2023). This meant that SwDs preferred taking online versus in-person courses due to the flexibility of learning at one's own pace and at one's desired time, sharing their own lived experiences of not always being able to learn at a set time (e.g., chronic illness flare-up that day, inaccessible weather; Fujita et al., 2023). This suggests that lack of accessible online classes can hinder the success of SwDs in their classes.

Furthermore, Furrie's (2017) study analyzed various disability-specific surveys conducted by Statistics Canada and found that many SwDs did not receive the accommodations they believed they needed to succeed (ranging from 8.3% to 32% depending on the type of accommodation). Carroll's (2020) literature review provides further insight into why this is the case, suggesting that SwDs face new challenges in PSE because the level of support in PSE is less than what was available in high school, since university instructors do not have specific training in teaching SwDs unlike high school instructors (Carroll, 2020). Carroll (2020) also found that students reported it being much harder to advocate for oneself and navigate the stigma around accommodations in PSE (Carroll, 2020).

One focus group study of STEM SwDs investigated the role of instructors in SwDs' learning more closely and found that they reported their instructor having the biggest impact on their ability to be successful in class (Jenson et al., 2011). Supportive instructors helped them to be more motivated and persevere even when the course become more difficult, and they were highly influential in determining students' confidence, motivation, anxiety, and stress – all determinants of academic success (Jenson et al., 2011).

Clearly, despite the challenges that SwDs face in their classes, many of them also felt as though they could succeed if they had supportive instructors.

Graduate Programs

Graduate programs pose unique accessibility challenges to SwDs because of the structural differences compared to undergraduate programs (Rose, 2010). The learning and evaluation structure of graduate programs are generally more independent, based on reaching rigid milestones and involve producing supervised research (NEADS, n.d.). Whereas undergraduate programs have relatively standardized course work, graduate programs are more open-ended and also involve non-course work components, such as

lab work, placements, seminars, theses, independent research, and teaching/research assistantship (Rose, 2010).

There is also the novel addition of the student-supervisor relationship, which impact many outcomes of the graduate-level SwDs, such as degree quality and completion, career advice and direction, future references (NEADS, n.d.; Rose, 2010). In fact, the graduate student's disability can often lead to strain the student-supervisor relationship in certain situations, particularly if the supervisor holds attitudinal barriers (NEADS, n.d.). This, again, highlights the importance of instructor/supervisor support in SwDs' success.

Thus, many graduate SwDs report needing a greater breadth of accommodations in their transition from an undergraduate to graduate degree because of these additional challenges (NEADS, n.d.). The accommodation process for graduate students also less clearly established compared to the policies and processes for undergraduate students, making it more difficult for graduate SwDs to receive the accommodations they need (NEADS, n.d.; Rose, 2010). In fact, many graduate SwDs report not receiving the accommodations they need to be successful in their graduate program, which often leads to graduate SwDs feeling forced to disclose their disability directly to their supervisor to receive informal accommodations (Collington & Fowler, 2024; NEADS, n.d.).

Thus, there are additional factors when considering the experiences and accommodation needs for SwDs in graduate programs.

b. Instructor Experiences

Given that SwDs perceive instructor support as an important factor in the quality of their education, we will explore instructor experiences in teaching SwDs, to highlight relevant trends and challenges in their experiences with teaching SwDs.

One mixed-methods study administered questionnaires and interviews to college instructors in Ontario and found that most instructors wanted to support SwDs, but they did not feel equipped to do so (Hansen, 2013). Instructors had moderate ratings in positive attitudes and knowledge in teaching SwDs (specifically learning disabilities), but in practice, they felt unprepared to teach them (Hansen, 2013). They also held many misconceptions of what a learning disability is and the needs of those with a learning disability (Hansen, 2013). In fact, only 40% of instructors reported having undergone training for teaching students with learning disabilities, and most had limited understanding of Universal Design for Learning, despite the AODA stating that educators must be trained in accessible course design and delivery (Hansen, 2013). Consequently, many instructors voiced a desire for more professional development in teaching SwDs, emphasizing the need for institutions to train instructors explicitly in inclusive education

instead of their "training" occurring through trial and error on the job (Hansen, 2013). The study also found that faculty members were more willing to support SwDs when they felt as though they had sufficient support from the disability services office at their institution (Hansen, 2013).

Evidently, both SwDs and instructors express the importance of the instructor's role in SwDs' academic experience. Students often feel unsupported and instructors ill-equipped, both of which have implications for the wider institution.

c. Implication of Risks: Enrollment and Retention Rates

One implication of the barriers that SwDs face in their academics is the risk of their lower enrollment rates or higher drop-out rates. The following sections explore the implications of when an institution fails to address accessibility considerations in its academic operations on their enrollment and retention rates.

Enrollment in Postsecondary Education (PSE)

In Canada, PSE enrollment rates for SwDs are indeed found to be lower than non-SwD enrollment rates (Finnie et al., 2011). A database study conducted in British Columbia (BC) using longitudinal data of BC high school graduates' enrollment rates in PSE found lower average enrollment rates of SwDs into PSE (73.2%) compared non-SwDs (82.4%; Leanage & Arim, 2024). A report conducted by the Higher Education Quality Council of Ontario in 2011 reported similar findings: lower enrollment rates into university (i.e., excluding trade schools and college) by age 21 among Ontarians with disabilities (22.1%) compared to Ontarians without disabilities (48.5%; Finnie et al., 2011).

Moreover, according to Leanage & Arim's study (2024), BC high school graduates with disabilities were also less likely to enroll in PSE *immediately* after graduation compared to those without a disability (45.1% compared to 53.1%).

These findings highlight a critical demographic gap in student enrollment in PSE institutions in Canada, suggesting that there are factors which impact SwDs' decision and/or ability to enroll in a PSE. Furthermore, this suggests that current conditions which inform enrollment for SwDs inequitable, demonstrating a need for greater accessibility in PSEs to provide access for this student demographic.

Retention in University

Enrollment rates do not always paint the full picture of SwDs in PSE, as enrollment rates do not capture students who enroll but discontinue their education before reaching graduation. One way to capture the picture of SwDs in PSE more holistically is to also look at retention rates (i.e., the number of students that are still enrolled after a period of time).

Looking at enrollment rates and retention rates in conjunction with one another helps more fully capture the nuance of how SwDs participate in and experience PSEs, as their decision and reasoning to initially enroll versus stay enrolled may be different.

One longitudinal study in BC examined the retention rates of SwD in PSE two years after enrollment and found that SwDs were less likely to remain enrolled in PSE compared to non-SwDs (average of 74.7% versus 84.2%; Leanage & Arim, 2024). Furthermore, a report using data from Statistic Canada's General Social Survey (2016) indicated higher PSE attainment rates (implying retention until successful completion of degree) for non-SwDs compared to SwDs in Ontario: 74% of Ontarians without a disability have PSE attainment by age 65 compared to an average of 61.8% of Ontarians with disabilities (Chatoor, 2021).

These findings suggest that there are additional factors that inform a SwD's willingness and/or ability to persist in the PSE in addition to the impeding factors for initial enrollment.

Enrollment in STEM Programs

Beyond general enrollment, there appear to be factors in science, technology, engineering, and mathematics (STEM) programs in particular that decrease the likelihood for SwDs to enroll those programs.

According to Leanage and Arim's (2024) study, SwDs in Canada are on average less likely to enroll in STEM programs (14.6%) compared to non-SwDs (25.8%). Rather, SwDs tend to enroll in non-STEM programs such as business, humanities, health, arts, social science, and education (Leanage & Arim, 2024; Mccloy & Declou, 2013).

This suggests that there are characteristics of STEM programs which make it harder or less appealing for SwDs to enroll. In fact, the very nature of STEM programs can be inaccessible and difficult to create accommodations for, as the programs often have mandatory laboratory sessions, a reliance on exam-based assessments, larger class sizes, and less flexibility within the programs (Chasen et al., 2025). Prema and Dhand (2019) suggested that lower enrollment rates of SwDs in STEM programs may be due to barriers of accessibility such as inadequate accommodations, physical barriers (e.g., in lab spaces), and low expectations from instructors. This, again, highlights the importance of instructor support for students' success especially for SwDs.

Furthermore, Chasen et al.'s (2025) systematic review found that 18 out of 20 US-based studies reported that STEM instructors hold more negative attitudes toward SwDs, less knowledge about disabilities, and/or were less willing to accommodate SwDs compared to their non-STEM counterparts. This may explain why there are less SwDs enrolled in STEM programs, since STEM SwDs report the instructor being the biggest influence on their success in a class (Jenson et al., 2011; see Student Experiences)

Thus, we see that SwDs face barriers in their learning environment which also affects the institutional through their enrollment and retention rates of SwDs.

Opportunities for Improvement

There are, however, many ways for PSE institutions to mitigate the effects of these risk factors. First, it would involve reducing current risks factors, such as offering more flexible options for class modalities (such as online or hybrid classes), ensuring adequate accommodations and accommodation process, and providing instructors with sufficient support to teach SwDs confidently.

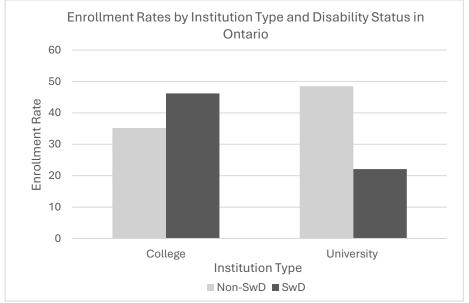
Next would be to implement factors that could *increase* enrollment and retention behaviours for SwDs, mitigating the effects of other risk factors and reducing institutional risks. The following sections discuss some of these factors.

a. College versus University

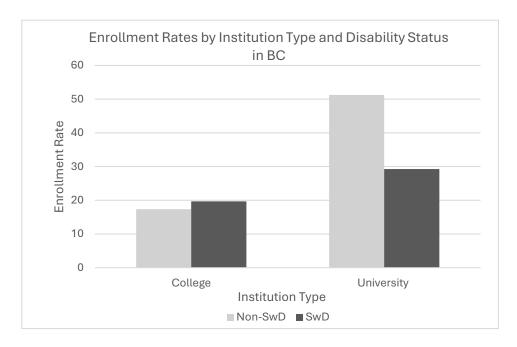
The enrollment rates in college versus university among Canadian students differ between SwDs and non-SwDs (Finnie et al., 2011; Leanage & Arim, 2024). Graphs 1 and 2 below display the college and university enrollment rates in student samples from two studies. Finnie et al. (2011) found greater enrollment in college than in university for SwDs, whereas Leanage and Arim (2024) found greater enrollment in university across both groups. In both samples, however, the enrollment rate of SwDs in colleges is higher than enrollment rates of non-SwDs in colleges.

Graph 1: Finnie et al.'s (2011) College and University Enrollment Rates by Disability Status in Ontario

Enrollment Rates by Institution Type and Disability Status in



Graph 2: Leanage & Arim's (2024) College and University Enrollment Rates by Disability Status in British Columbia



This suggests that there is some aspect of the college environment that entices SwDs more than non-SwDs and may even lead to greater enrollment in college among SwDs. A report from the University of Illinois and Purdue University suggested this could be due to colleges' affordability, its open-door policies, and the support services they offer (Zamani-Gallaher & Bell, 2018). We will consider what this means for non-college institutions (such as Waterloo) later on.

Another potential reason could be due to the smaller class sizes in colleges, the benefits of which are explained in the following section (University Canada West, 2024).

b. Small versus Large Class Size

There is evidence that SwDs prefer smaller class sizes (Lipka et al., 2018). In fact, a number of studies have found that increasing class size generally has a negative effect on student retention, regardless of disability status (Kerr, 2011). In part, this is due to students feeling isolated and anonymous in big classrooms, leading to reduced feelings of personal responsibility and motivation to learn, which in turn reduces student engagement and even increases drop-out rates (Kerr, 2011).

These effects could be particularly profound for SwDs (Lipka et al., 2018). Lipka et al. explored students' and instructors' perceptions in using an adapted course structure for students with a learning disability or attention-deficit hyperactivity disorder. The adapted structure provided more support to these students through smaller classes, greater access

to the instructor to ask questions and to receive support from, and a more conducive space for paying attention (Lipka et al., 2018). This extra support from instructors led to more effective learning, as it may have mitigated the feeling of isolation and reduced engagement found in large classes, through creating a sense of commitment to the learning process in both the student and the instructor (Lipka et al., 2018). This once again highlights the importance of instructor support in the success of SwDs.

The benefits of smaller class sizes to SwDs' learning are clearly laid out, as they mitigate the inherent risks student engagement and retention rates in large classes, particularly as a result of instructors' reduced capacity to support each student. This evidence suggests that smaller class size can be mitigate the risks to enrollment and/or persistence in PSE for SwDs.

Waterloo's Current Accessibility Reputation and Student Perceptions

In the absence of an institutional-wide mandate that would stipulate specific inclusive and equitable practices, there are areas where Waterloo has fallen short in providing many basic accessibility considerations in the learning environment. As a result, SwDs at Waterloo often experience barriers to their academic success in the post-secondary learning environment.

Beyond the classroom, Waterloo recognizes that for its students to succeed, they need to be supported in all aspects as a whole person, acknowledging the holistic interconnectedness of student learning (Spafford, 2021). This means that to understand SwDs' academic experiences, we must also consider how they are supported through other campus wellness services.

So, the following section highlights the experiences in accessibility and inclusivity across campus as reported by Waterloo students, both with and without disabilities, indicating possible institutional risks for Waterloo resulting from the maintenance of an inaccessible learning environment.

Accessibility Report (2021)

Waterloo Undergraduate Student Association's (WUSA)'s Accessibility Report (2021) found that while many students reported having positive experiences with AccessAbility Services (AAS) and were accommodated accordingly by their instructors, many also reported difficulties with the accommodation process, suggesting it can be cumbersome and time-consuming (Cammy et al., 2021). Overall, there are many aspects of the accommodation

process that students would like to be better supported in or improved, and they suggest that the negative experiences often overshadow the good experiences (Cammy et al., 2021).

Similar findings have been shared by SwDs at Waterloo in receiving care from Health Services and Counselling Services. Students expressed a need to increase the capacity for these campus wellness supports in order to reduce wait times and provide for all students in need of help, particularly with mental health support (Cammy et al., 2021).

Directly in the academic realm, students reported mixed experiences with accessibility in Waterloo's learning environment. Two major issues that students reported were stigma against disabilities and barriers within teaching/learning structures (Cammy et al., 2021). 43% of respondents, including non-SwDs, did not believe their instructors were accommodating or understanding about disabilities, some citing instances of instructors refusing to accommodate despite requests from AAS (Cammy et al., 2021). These findings were particularly prevalent in the responses of students enrolled in STEM programs. Students in these disciplines believed these programs were not designed with accessibility needs in mind, aligning with the findings of previous literature (Cammy et al., 2021).

Student Safety & Mental Health Report (2024)

This report put out by WUSA found that a smaller proportion of SwDs feel safe and welcome on campus (Daniels et al., 2024). This means less SwDs report feeling as though their values are respected, that they can be their authentic self, and more SwDs experiencing hostility and harassment, compared to the ratings of the greater student body (Daniels et al., 2024).

Overall, students' negative experiences with various campus wellness supports have coloured their view of accessibility at Waterloo and their feelings of being included on campus. Thus, despite Waterloo's vision to foster an environment of inclusivity and accessibility, particularly to ensure SwDs feel welcome, this ideal may not completely align with how students perceive the institution, leaving Waterloo vulnerable to the institutional risks on enrollment.

Implications of Risks for Waterloo

The perceptions students have of accessibility and inclusivity at Waterloo have great implications for us, as they are a reflection of real deficits in our efforts to foster an accessible environment, both inside and outside the classroom. These gaps between our

vision for what should be and our reality may perpetuate and maintain the inaccessibility in Waterloo's learning environment.

For example, Cammy et al.'s report (2021) found that a notable number of students believed that instructors at Waterloo were not providing sufficient support to create an accessible learning environment, especially in STEM programs. This is particularly concerning when considering the findings that instructors play one of the biggest roles in determining the success of SwDs, especially in STEM programs (Jenson et al., 2011; Lipka et al., 2018). The actions (or inaction) of instructors could be one factor in perpetuating the inaccessibility still be found at Waterloo, putting us at institutional risks.

Of additional concern is that Waterloo lacks the mitigating factors discussed previously that would help create a more accessible learning environment to reduce institutional risks. These mitigating factors include being a college institution and offering smaller class sizes, but they clearly do not apply to Waterloo, as it is not a college nor does it offer many small classes (particularly in 100- and 200-level courses). In light of these inherent institutional risks at Waterloo, we have an even greater responsibility to decrease accessibility barriers in other areas or find alternative ways to provide the benefits that colleges and smaller classes would provide (e.g., more instructional support via teaching assistants). Otherwise, Waterloo remains at unnecessarily high institutional risk.

These institutional risks go beyond simply having lower enrollment and retention rates of SwDs as discussed. For example, inaccessibility also puts Waterloo at risk of being in contravention of accessibility laws such as the provincial legislation stated in the Ontario Human Rights Commission, which imposes regulations on PSEs to accommodate to the point of undue hardship (Ontario Human Rights Code, 2013). Failure to comply places Waterloo at risk of litigation.

Furthermore, it puts Waterloo at risk of creating a reputation and culture of inaccessibility and exclusivity at the institution, leaving current students feeling unsafe and prospective students to enroll elsewhere potentially. In fact, we can already begin to see this inaccessible reputation form, to the extent that even students not directly affected by a disability report that their negative experiences with various aspects of accessibility on campus often overshadow their positive experiences students report (Cammy et al., 2021).

Moreover, Waterloo is especially known for its STEM and graduate research programs, both of which are commonly shown to have barriers in accessibility. Since the literature has shown that SwDs are less likely to enroll in these barrier-heavy STEM programs, this behaviour is likely found at Waterloo too, affecting the diversity of STEM cohorts. This may create an image and an unspoken message that these Waterloo programs are elitist and

exclusive, contributing further to an unwelcoming campus environment not only for SwDs but for everyone.

Thus, given the landscape of student experiences and all of the various risk factors that Waterloo holds, it currently have a high institutional risk. These include risks of litigation for noncompliance with accessibility standards, lower enrollment and retention rates leading to loss of income from tuition or research grants, but also risks less diversity in the campus population, the creation of a reputation of inaccessibility, and ultimately perpetuating the access disparities that SwDs face. The need for Waterloo to create change is clear, and we must advocate for continued progress in our current accessibility efforts.

Conclusion and Next Steps

There is need for continued or even increased efforts in creating a more accessible and inclusive campus at Waterloo. There are still many areas in which we can improve accessibility to bring Waterloo's reality closer to its vision for accessibility and inclusivity, ensuring equitable and fair education for all its students.

One theme that has emerged several times throughout this report is the need for better instructor support. SwDs have greater success in their learning when they are supported well by their instructors, and many instructors want more training to teach their SwDs more effectively. Research has also found that instructors may also be more willing to support SwDs if they feel supported by their institution's disability services office, making instructor support an obvious and salient potential first step towards greater accessibility at Waterloo.

We also strongly encourage instructors to do their own work to improve their knowledge and practices in teaching and supporting SwDs better. The Teaching Innovation Incubator's <u>Accessible Education Project</u> is identifying and providing many supports and resources to support instructors in doing this.

One of the outputs of this project is the creation of the Accessible Teaching website, a resource hub for instructors providing information on accessible teaching basics. These instructional resources and guides provide actionable steps that require minimal background or expertise on accessibility and are relatively quick and easy to implement, which can serve as a great next step for you to learn about how to play your part in creating a more accessible Waterloo future. Check it out now!

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