

# Students with disabilities: Relationship between participation rates and perceptions of work-integrated learning by disability type

LAURA E. GATTO<sup>1</sup>

HEATHER PEARCE

MIANA PLESCA

LUIZA ANTONIE

*University of Guelph, Guelph, Canada*

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There is limited research available that examines students with disabilities' participation rates and perceptions of Work-Integrated Learning (WIL) while in post-secondary. This is problematic as universities in Canada are growing their WIL programs to improve school to work transition rates. This research finds that 23% of students who are registered with the Disability Services Office for academic accommodations have engaged in WIL. For those who have not engaged in WIL, almost 50% strongly or somewhat agreed that their disability was a factor. Furthermore, students with mental health disorders are 3.3 times less likely to have had a WIL experience. Participation in WIL increases students with disabilities' probability of reporting more positively that they understand the accommodations they may need in WIL. However, only 17% of students with disabilities in a co-operative education program reported requesting accommodations in a co-op work term.

Keywords: Work integrated learning, students with disabilities, barriers to school to work transition, co-operative education

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Youth unemployment and underemployment is a concern in Canada. Kolb's (1984) experiential learning model and the pedagogy of work-integrated learning (WIL) (Billett, 2009) are being adopted in Canadian higher education to support students to more easily transition from school to work. Research supports that WIL increases labor market outcomes for students when they graduate (Ferguson & Wang, 2014; Walters & Zarifa, 2008). Federal and Provincial Governments are financially incentivizing universities and colleges to increase their experiential learning programs. In fact, the Government of Canada's 2019 Budget included a section called "Investing in Young Canadians" that dedicated \$800 million in funding to grow 84,000 new WIL opportunities per year (Government of Canada, 2019). In 2017, the Province of Ontario's Career Ready Fund was established for universities and colleges to offer more programs with "hands on learning" (Ontario Ministry of Colleges and Universities, 2018). In addition, the Ontario Ministry of Colleges and Universities 2019-2020 Annual Report included the following priority:

The government is committed to bringing financial accountability and sustainability back to Ontario's post-secondary education system to ensure colleges and universities are providing positive economic outcomes and the knowledge, skills and training students and people need for the jobs of the future. (Ontario Ministry of Colleges and Universities, 2019)

As a result, the Government of Ontario recently announced that experiential learning is a performance metric in college and university Strategic Mandate Agreements (Government of Ontario, 2020). This is new territory for universities who, unlike colleges, have not necessarily been accountable for the labor market outcomes of their graduates.

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<sup>1</sup> Corresponding author: Laura Gatto, [gattol@uoguelph.ca](mailto:gattol@uoguelph.ca)

This case study was conducted at a medium-sized comprehensive University with just under 30,000 undergraduate and graduate students in Southern Ontario, Canada. At the time of the study, approximately 2,500 students were registered with the Disability Services Office for academic accommodations and almost 50% of registrants had a mental health disorder. The second largest disability registered on the campus was a specific learning disability at a frequency of approximately 20%. In the last five years, mental health disorder registration increased at the University by 19% per year on average.

### *Research Problem*

Lack of WIL experience may negatively impact students with disabilities' transition rates to the labor market when they graduate. Unfortunately, there is limited research available in Canada regarding WIL and students with disabilities. As universities rapidly grow their WIL offerings to meet Government mandates, it is crucial that they have access to information about the experiences of students with disabilities engaging in WIL. The main contributions of this paper are in increasing our understanding of the relationships between participation rates and perceptions of WIL by disability type and WIL experience to better equip universities to offer accessible WIL activities to this cohort.

### *Research Questions*

Focusing on one typology of WIL - Structured Work Experience - defined as: co-operative education, internships, field experiences, mandatory professional practices (Sattler et al., 2011) "in which students are familiarized with the world of work within a post-secondary education programme" (Stirling et al., 2016, p. 5), two surveys were administered to undergraduate students registered with the Disability Services Office and undergraduate students registered in an optional co-operative education program, respectively. The surveys were designed to answer the following research questions: 1) What is the frequency of disability type by WIL participation rates; 2) How many students with disabilities participate in WIL and what variables increase or decrease the likelihood of participation; 3) Are perceptions of WIL influenced by disability type and WIL experience and what variables increase the probability of being more positive or more negative about WIL; and, 4) For those students with disabilities who participate in WIL, how many disclose their disability and request accommodations?

### RELATED WORK

The Canadian Survey on Disability (Morris et al., 2018) indicates that one in five Canadians (22%) have one or more disabilities. This demographic is also under-represented in the labor market (Turcotte, 2014; Statistics Canada, 2019). Canadian youth with disabilities are unemployed at a rate of 25.9%, compared with 15.3% of youth without disabilities (Government of Canada, 2016), graduate with less work experience (Noel et al., 2017) and have lower employment rates and earnings upon graduation from post-secondary (McCloy & DeClou, 2013). Research demonstrates that WIL helps students with disabilities to development the human and social capital needed to transition from school to work (Bellman et al., 2014; Lindsay et al., 2013; Mamun et al., 2018). Yet, there is no quantitative data available in Canada specific to participation rates for post-secondary students with disabilities in WIL.

To determine what variables are correlated with WIL participation rates, survey questions were developed based on themes in previous research; specifically, lack of accessible WIL opportunities (Mackaway et al., 2013; National Educational Association of Disabled Students, 2018; Ontario Partnership Council on Employment Opportunities for People with Disabilities, 2015; Prince, 2016), perceived discrimination from employers (Gillies, 2012; Lindsay, 2011), insufficient disability related

resources specific to WIL (Gatto et al., 2021; Nolan et al., 2015; Stevenson & Mellway, 2016) and challenges around disclosure and accommodations in WIL activities (Jetha et al., 2019; Summers et al., 2014; Turcotte et al., 2016).

#### DATA SELECTION AND ANALYSES

Anonymous e-surveys were used as it afforded the opportunity to collect data that is not accessible from the University. Specifically, the first survey group provided information about how many students who have registered their disability with the University for academic accommodations have engaged in WIL. The second survey group provided information about how many students registered in an optional co-operative education program are living with one or more disabilities. The importance of the students' perceptions of WIL and availability of support measures (Likert scale survey question responses) were also analyzed as a determinant of students' participation rates in WIL and if their perceptions of WIL are influenced by disability type and WIL experience.

Survey responses were collected from two Qualtrics anonymous e-surveys that were approved by the University's Research Ethics Board (#18-11-012): 1) survey for undergraduate students registered with the University's Disability Services Office as of January 2019; and 2) survey for undergraduate students registered in an optional co-operative education program as of January 2019. For the remainder of the paper, Disability Services Office respondents are labelled as the DSO group and the Co-operative Education Office respondents are labelled as the COOP group. Survey respondents were asked to indicate their disability or disabilities. The types of disabilities listed in the survey are those defined by the University when a student registers for academic accommodations. To ensure anonymity, demographic questions (e.g., race, gender) and program characteristics (e.g., degree, major) were not asked to prevent identification of students who have disabilities with low frequency numbers on campus. As an example, one percent of students registered with the Disability Services Office have a vision impairment. Providing additional background information about survey participants with this disability could lead to their identification.

Respondents were also asked to rate a series of statements, listed in Table 1, about their perceptions of WIL (defined as internships, co-op education, field experiences and mandatory professional practices) with Likert scale questions coded as Strongly Disagree = 1; Somewhat Disagree = 2; Neither Agree nor Disagree = 3; Somewhat Agree = 4; Strongly Agree = 5. There is no multicollinearity between the six WIL perception questions included in the analysis.

The DSO group survey was emailed to 2561 students who have all registered their disability for academic accommodation with the University. Of that, 187 surveys were completed with a response rate of 7.3%. One survey was removed because the disability status question was skipped. The COOP group survey was emailed to 3416 students registered in an optional co-operative education program. For this survey group, 312 of the 3416 surveys emailed were completed with a response rate of 9.2%. Seven respondents who selected "I do not consent" were removed and five respondents were removed as the disability status question was blank. Additional descriptive statistics are available in Appendix A and B regarding participation rates by WIL type and co-op work term level for those respondents who indicated they are in a co-operative education program.

TABLE 1: Survey questions.

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Survey Questions included in both Surveys

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Are you a student living with any of the following disabilities?

If yes, please select all that apply: Acquired Brain Injury (ABI); Attention Deficit Hyperactive Disorder (ADHD); Autism Spectrum Disorder (ASD); Hearing Impairment; Medical or Chronic Illness; Mental Health Condition; Mobility/ Dexterity; Specific Learning Disability; Vision Impairment; Prefer not to say.

Have you engaged in any work-integrated learning programs such as co-operative education, internships, field experiences, and/or mandatory professional practices in university?

If yes - Please indicate the type of work-integrated learning program you have engaged in (check all that apply): co-operative education; internships; field experiences; mandatory professional practices; other.

If yes - Have you asked for accommodations for your disability as it relates to your participation in co-operative education, internships, field experiences, and/or mandatory professional practices?

If yes to co-operative education - Please indicate the most recent level of the co-op sequence that you have completed or are in the process of completing.

I perceive employers as sensitive to the disability needs of students engaged in WIL.

Students with disabilities have equal access to WIL.

My University provides disability support to students with disabilities to succeed in WIL.

I believe there are sufficient services and supports available to help me/students with disabilities in WIL.

I have a good understanding of the accommodations I need/may need to manage my disability in WIL.

I am/would be comfortable disclosing my disability in WIL.

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Additional Survey Questions Specific to the DSO Group

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If no to WIL- My disability influenced my decision not to engage in co-operative education, internships, field experiences, and/or mandatory professional practice.

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Additional Survey Questions Specific to the COOP Group

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Are you living with a disability?

If yes - Are you registered with the Disability Services Office

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*Note.* Each survey question defined WIL as co-operative education, internships, field experiences, and/or mandatory professional practices. Due to limited space in the Table, the abbreviation WIL is used.

Subscribing to the findings that parametric tests can be employed on Likert scale responses (Sullivan & Artino, 2013) Pearson's chi-squared test and Mann-Whitney U test are used to measure if observed differences in responses are statistically significant or by chance (Field, 2013). Binary Logistic Regression is applied to calculate the probability of being in WIL and the probability of being in the COOP group. To further explore students' perceptions of WIL, ordinal logistic regression measured if the likelihood of being more positive or more negative to WIL is influenced by type of disability, presence of comorbidity and survey group membership.

For the DSO group, 12 students indicated they were in a registered co-operative education program. As the surveys are anonymous, it is unknown if these 12 students also completed the survey for the COOP group. In the COOP group, 24 students indicated they had registered their disability with the University to receive academic accommodations (one survey skipped the question). For Pearson's chi-squared tests measuring statistical differences in frequencies by disability type and comorbidity, all responses are included as the significant differences were the same when including or excluding respondents who could be in both survey groups. When analysis is conducted on respondents from only one group, all responses are included. However, to address the potential for variance of the impact of having dual membership on their perceptions of WIL, when comparing both groups, the analysis does not include the 12 respondents in the DSO group who are in a co-operative education program and the 24 respondents in the COOP group who have registered their disability with the University.

## RESULTS

### *Frequency of Disability Type*

Table 2 displays the frequencies of disability type by the total number of disabilities selected by the DSO and COOP groups. At the time of the study, the University reported that half of all students who had registered for academic accommodations with the University have mental health disorders. The 2019 rates of the disabilities registered with the University for academic accommodations are available in Appendix C for comparison.

Pearson's chi-squared test indicates that the DSO group has statistically significant higher rates of respondents with ADHD, mental health disorders and mobility/dexterity disabilities (there are no students in the COOP group who selected mobility/dexterity). Conversely, there are statistically higher rates of students with a visual impairment in the COOP group. Respondents in the COOP group are also significantly more likely to select "prefer not to say" when asked to select disability type compared to the DSO group.

TABLE 2: Frequency of selection of disability type by total number of disabilities selected and by total number of completed surveys.

Type of Disability	DSO (i) by disability (%)	COOP (ii) by disability (%)	DSO (iii) by survey (%)	COOP (iv) by survey (%)
Acquired Brain Injury (ABI)	6.5	7	10.8	8.7
Attention Deficit Hyperactive Disorder (ADHD)**	13.7	7.9	22.6	9.8
Autism Spectrum Disorder (ASD)	1.6	3.5	2.7	4.3
Hearing Impairment	1.6	2.6	2.7	3.3
Medical or Chronic Illness	11.1	8.8	18.3	10.9
Mental Health Condition**	49.0	51.8	80.6	64.1
Mobility/ Dexterity**	4.9	0	4.3	0
Specific Learning Disability	8.5	6.1	14	7.6
Vision Impairment*	2.6	8.8	4.3	10.9
Prefer not to say*	0.3	3.5	0.5	4.3
N	306	114	186	92

*Note.* (i) For the DSO group, a total of 306 disabilities were selected. The frequency by disability was calculated by the number of times a disability type was selected divided by 306. (ii) For the COOP group, a total of 114 disabilities were selected. The frequency by disability was calculated by the number of times a disability type was selected divided by 114. (iii) For the DSO group, 186 surveys are included. The frequency by survey was calculated by the number of times a disability type was selected divided by 186. (iv) For the COOP group, 92 surveys are included. The frequency by survey was calculated by the number of times a disability type was selected divided by 92. The following symbols indicate statistically significant differences of frequency of disability between the two groups for \* $p \leq 0.05$ , \*\* $p \leq 0.005$  and \*\*\* $p \leq 0.001$ .

### Frequency of Comorbidity

The number of students with comorbidity (having more than one disability concurrently) is very evident. In Table 3, the frequency of having one, or more than one disability (being comorbid) is compared for each group.

TABLE 3: Comparing frequency of comorbidity by DSO and COOP group.

Number of Disabilities	DSO	DSO	COOP	COOP
	N	(%)	N	(%)
One Disability*	98	52.7	70	76.1
More than One Disability***	87	46.8	18	19.6
Prefer Not to Say	1	0.5	4	4.3
Total	186	100	92	100

*Note.* The following symbols indicate statistically significant differences of comorbidity between the two groups for \* $p \leq 0.05$ , \*\* $p \leq 0.005$  and \*\*\* $p \leq 0.001$ .

There is a statistically significant difference in the rates of comorbidity with the COOP group having less comorbidity than the DSO group. This result may provide evidence that comorbidity could be a barrier to participation in an optional co-operative education program.

*Participation Rates in Work-Integrated Learning for Students with Disabilities*

*Participation rates in WIL for students who have registered for academic accommodations*

The DSO group is comprised of students who have disclosed their disability to the University. However, their participation in WIL was previously unknown. The COOP group is not included in this analysis because all respondents in the COOP group participate in WIL.

When the DSO group was asked: "Have you engaged in any work-integrated learning programs such as co-operative education, internships, field experiences, and/or mandatory professional practices in university?", 42 respondents (22.58%) indicated they have participated in WIL. The 144 respondents who indicated they have not engaged in a WIL were asked the additional question: "My disability influenced my decision not to engage in WIL". Of the 142 that answered this question, 18% strongly disagreed, 13% somewhat disagreed, 22% neither agreed nor disagreed, 27% somewhat agreed and 21% strongly agreed with the statement. Almost 50% of students with disabilities who indicated they have not engaged in WIL strongly agreed or somewhat agreed that their disability influenced their decision.

To provide more insight into the variables that may impact WIL participation for the DSO group, binary logistic regression analysis is used to measure if the explanatory variables of disability type, comorbidity and their perceptions of WIL increase or decrease the probability of being in WIL. Results of this analysis are presented in Table 4.

Students living with mental health disorders are 3.3 times less likely to engage in WIL. Two of the six perception questions are also statistically significant predictors of the probability of participating in WIL. Those who are more positive that they understand accommodations in WIL are 1.8 times more likely to be in WIL. This result suggests that participation in WIL is positively correlated with increasing students with disabilities' self-reporting on their understanding of accommodations in the WIL context. However, a reverse relationship is found for the question: "Students with disabilities have equal access to WIL". Those who are more positive to this question are 1.7 times less likely to be in WIL. Meaning, those in WIL have a higher probability of being negative to perceiving WIL as accessible compared to those respondents who are not in WIL. This finding could indicate that students with disabilities are facing challenges as they navigate WIL. This is explored further when comparing perceptions of WIL by respondent characteristics.

TABLE 4: Probability of the DSO group engaging in WIL by disability type, comorbidity and perceptions of WIL - binary logistic regression.

Explanatory Variables	B	S.E.	p	Exp(B)	95% C.I.	
					Lower	Upper
Acquired Brain Injury (ABI)	-0.726	0.701	0.301	0.484	0.122	1.913
Attention Deficit Hyperactive Disorder (ADHD)	-0.324	0.5	0.517	0.723	0.271	1.928
Autism Spectrum Disorder (ASD)	-0.009	1.312	0.995	0.991	0.076	12.974
Hearing Impairment	1.237	1.267	0.329	3.446	0.288	41.255
Medical or Chronic Illness	-0.511	0.544	0.348	0.6	0.206	1.744
Mental Health Condition	-1.187	0.506	0.019	0.305	0.113	0.822
Mobility/Dexterity	0.903	0.696	0.194	2.468	0.631	9.659
Specific Learning Disability	-0.635	0.625	0.31	0.53	0.156	1.805
Vision Impairment	0.93	0.867	0.283	2.535	0.464	13.862
Comorbid	-0.277	0.418	0.507	0.758	0.334	1.718
Employers Sensitive Dis. Needs	0.385	0.228	0.091	1.469	0.94	2.297
SWD have Equal Access to WIL	-0.567	0.211	0.007	0.567	0.375	0.858
My Uni. Supports me in WIL	-0.084	0.267	0.752	0.919	0.545	1.55
Sufficient Services for WIL	0.14	0.226	0.535	1.151	0.738	1.794
Understand WIL Accommodations	0.438	0.172	0.011	1.549	1.107	2.169
Comfortable Disclosing in WIL	-0.175	0.147	0.235	0.839	0.629	1.121
Constant	-0.275	1.18	0.815	0.759		

n = 186

*Note.* Students with disabilities abbreviated to SWD and Work Integrated Learning abbreviated to WIL. B values (coefficients) are the unstandardized regression weights in the regression equation predicting the dependent from independent variables. Exp(B) values represent the odds ratios for the B values and are the exponentiation of the coefficients. S.E is the Standard Error of the regression coefficient. C.I. is the Confidence Interval that indicates with 95% confidence that the range contains the true mean of the population. These ranges are larger due to the smaller sample size.

*Participation rates in a co-operative education program for students who have disclosed they have a disability*

The COOP group are all registered in WIL but their disability status is unknown. The DSO group are excluded from this analysis as all respondents in the DSO group have one or more disabilities. Of the 300 completed surveys in the COOP group, 92 (33.66%) respondents' self-identified as having at least one disability. At the time the survey, the Co-operative Education Office had record of 23 students who self-disclosed that they had a disability, of the 3416 students registered in a co-operative education program (0.67%). Given the national rates of disabilities for young Canadians and the discrepancy between the number of students indicating they have a disability in the survey compared to the number of students that have disclosed to the Co-operative Education Office, it appears that students are not disclosing their disability in a co-operative education.

*Probability of participation in a co-operative education program by disability type, comorbidity and perceptions of WIL*

As co-operative education is often considered the flagship of WIL in post-secondary, providing opportunities for full-time paid employment relevant to field of study, it is important to discover if variables exist that may influence participation rates for this type of WIL. The second analysis regarding students with disabilities' participation in co-operative education includes all respondents from both groups, save and except those with dual membership. In Table 5, the likelihood of being a respondent in the COOP group compared to the likelihood of being a respondent in the DSO group is reported by disability type, comorbidity and perceptions of WIL. The disability type of mobility/dexterity is removed as no respondents in the COOP group have this disability.

TABLE 5: Probability of being in the COOP group compared with the DSO group by disability type, comorbidity and perceptions of WIL - binary logistic regression.

Explanatory Variables	B	S.E.	p	Exp(B)	95% C.I.	
					Lower	Upper
Acquired Brain Injury (ABI)	-1.370	0.715	0.056	0.254	0.063	1.033
Attention Deficit Hyperactive Disorder (ADHD)	-1.362	0.627	0.030	0.256	0.075	0.875
Autism Spectrum Disorder (ASD)	-0.457	1.462	0.755	0.633	0.036	11.125
Hearing Impairment	-1.037	1.571	0.509	0.355	0.016	7.702
Medical or Chronic Illness	-0.767	0.593	0.196	0.465	0.145	1.485
Mental Health Condition	-1.062	0.532	0.046	0.346	0.122	0.982
Specific Learning Disability	-2.287	1.087	0.035	0.102	0.012	0.855
Vision Impairment	2.029	0.810	0.012	7.609	1.556	37.216
Comorbid	-1.814	0.488	0.000	0.163	0.063	0.424
Employers Sensitive Dis. Needs	0.897	0.231	0.000	2.451	1.558	3.857
SWD have Equal Access to WIL	-0.130	0.175	0.458	0.878	0.622	1.238
My Uni. Supports me in WIL	-0.255	0.263	0.333	0.775	0.463	1.298
Sufficient Services for WIL	0.312	0.219	0.153	1.367	0.890	2.098
Understand WIL Accommodations	0.049	0.163	0.763	1.050	0.763	1.446
Comfortable Disclosing in WIL	-0.442	0.140	0.002	0.643	0.488	0.846
Constant	1.118	1.187	0.346	3.059		

n = 242

*Note.* Students with disabilities abbreviated to SWD and Work Integrated Learning abbreviated to WIL. B values (coefficients) are the unstandardized regression weights in the regression equation predicting the dependent from independent variables. Exp(B) values represent the odds ratios for the B values and are the exponentiation of the coefficients. S.E is the Standard Error of the regression coefficient. C.I. is the Confidence Interval that indicates with 95% confidence that the range contains the true mean of the population. These ranges are larger due to the smaller sample size. For this analysis, the 12 DSO respondents in a co-operative education program and the 24 COOP respondents with disability registration with the University are removed.

Students who identify as having ADHD, a mental health disorder, or specific learning disability are less likely to be in the COOP group. Those with a specific learning disability are 9.8 less likely to be in the COOP group. Therefore, the two most prevalent disabilities that young Canadians have, mental health disorders and specific learning disabilities, are disability types least likely to be in a co-operative education program. Students who are comorbid are also 6.1 times less likely to be in the COOP group. These findings suggest that specific disability types and comorbidity reduce participation in this form of WIL. Those in the COOP group are also 2.5 times more probable of being more positive about employers supporting them in WIL. Interestingly, being comfortable disclosing a disability in WIL also decreases the likelihood of being in the COOP group.

#### *Student with Disabilities Perceptions of Work-Integrated Learning*

##### *Perceptions of work-integrated learning by respondent characteristics*

To increase our understanding about students with disabilities' perceptions of WIL, further analysis was conducted on all responses from the DSO and COOP groups controlling for a variety of characteristics presented in Table 6. Mann-Whitney U non-parametric tests are employed to compare the mean ranks of survey questions (each value assigned a rank, all ranks summed and divided by the total) by different characteristics. Due to the smaller sample size and the dependent variable not normally distributed, this method provides an opportunity to measure if there is a statistically significant difference to their perceptions of WIL as being more negative (lower mean rank value) or more positive (higher mean rank value). Responses are compared by the following characteristics: 1) Survey group (DSO group or COOP group); 2) DSO respondents with a WIL experience and DSO respondents without a WIL experience; 3) DSO respondents with one disability and DSO respondents with more than one disability; 4) COOP respondents with a co-op work term experience and COOP respondents without a co-op work term experience; 5) COOP respondents who are registered for academic accommodations and COOP respondents who are not registered for academic accommodations; and, 6) COOP respondents with one disability and COOP respondents with more than one disability.

The question regarding students' perceptions of the University supporting them in WIL showed no statistically significant differences for any of the conditions. The DSO group, compared with the COOP group, is more negative about employer supports, having equal access to WIL, and that sufficient services are available to support them in WIL. This may be explained in that the entire COOP group is registered in WIL, therefore increasing their perceptions of WIL being accessible to them. Only 22.54% of DSO group indicated they are in WIL. Students in the COOP group must also complete three to five co-op work terms with a company/organization thereby increasing their exposure to WIL employers and what services are offered in WIL. There is also evidence that being registered for academic accommodations has some correlation to perception of employers that is addressed later in the paper. Conversely, the DSO group is more positive to the question about their comfort levels disclosing in WIL compared to the COOP group. The DSO group is comprised of respondents who have all disclosed to the University for academic accommodations which may have some influence on their comfort levels with disclosure.

TABLE 6: Comparing differences in rankings of WIL perception questions by group characteristics - Mann-Whitney U Test.

Perception Question by Comparison Group	(i)				(ii)				(iii)			
	DSO Group		COOP Group		DSO WIL Experience NO		DSO WIL Experience YES		DSO Comorbid NO		DSO Comorbid YES	
	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank
I perceive employers as sensitive to the disability needs of students engaged in WIL.	173	105.81***	68	159.64	143	90.55	42	101.33	98	96.72	87	88.81
Student with disabilities have equal access to WIL.	172	114.31*	67	134.61	142	95.45	42	82.51	98	94.73	86	89.95
My University provides disability support to help me/students with disabilities succeed in WIL.	173	116.45	68	132.57	143	91.39	42	98.48	98	96.14	87	89.46
I believe there are sufficient services and supports available to help students with disabilities in WIL.	172	111.73***	68	142.68	142	90.94	42	97.76	98	92.57	86	92.42
I have a good understanding of the accommodations I need/may need to manage my disability in WIL.	171	116.46	68	128.9	141	85.83**	42	112.71	97	91.32	86	92.77
I am/would be comfortable disclosing my disability in WIL	174	127.16*	68	107.01	144	94.06	42	91.60	98	95.09	87	90.65

Note. (i) DSO group by COOP group. (ii) DSO respondents by WIL experience. (iii) DSO respondents by comorbidity. (iv) COOP respondents by co-op work term experience. (v) COOP respondents by registration for academic accommodations. (vi) COOP respondents by comorbidity. Students with Disabilities abbreviated to SWD and Work Integrated Learning abbreviated to WIL. The following symbols indicate statistically significant differences by characteristics for \* $p \leq 0.05$ , \*\* $p \leq 0.005$  and \*\*\* $p \leq 0.001$ . To calculate the mean rank, each response is assigned a value with the smallest observation assigned the value of 1, the second smallest observation assigned the value of 2 etc. and the average of the rankings is the mean rank (Field, 2013). For the DSO and COOP group comparison, the 12 DSO respondents in a Co-op program and the 24 COOP respondents with disability registration with the University are removed.

TABLE 6: Comparing differences in rankings of WIL perception questions by group characteristics - Mann-Whitney U Test.  
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Perception Question by Comparison Group	(iv)				(v)				(vi)			
	COOP Work Term NO		COOP Work Term YES		COOP Academic Accommodations NO		COOP Academic Accommodations YES		COOP Comorbid NO		COOP Comorbid YES	
	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank
I perceive employers as sensitive to the disability needs of students engaged in WIL.	33	46.44	59	46.53	68	49.57*	23	35.43	70	47.01**	18	34.72
Student with disabilities have equal access to WIL.	32	52.63	59	42.41	67	45.66	23	45.04	69	44.58	18	41.78
My University provides disability support to help me/students with disabilities succeed in WIL.	33	52.11	59	43.36	68	48.01	23	40.04	70	45.66	18	40.00
I believe there are sufficient services and supports available to help students with disabilities in WIL.	33	56.58**	59	40.86	68	47.39	23	41.89	70	46.26	18	37.67
I have a good understanding of the accommodations I need/may need to manage my disability in WIL.	33	53.47	59	42.60	68	47.17	23	42.54	70	47.17*	18	34.11
I am/would be comfortable disclosing my disability in WIL	33	59.98***	59	38.96	68	48.31	23	39.17	70	44.90	18	42.94

Note. (i) DSO group by COOP group. (ii) DSO respondents by WIL experience. (iii) DSO respondents by comorbidity. (iv) COOP respondents by co-op work term experience. (v) COOP respondents by registration for academic accommodations. (vi) COOP respondents by comorbidity. Students with Disabilities abbreviated to SWD and Work Integrated Learning abbreviated to WIL. The following symbols indicate statistically significant differences by characteristics for \* $p \leq 0.05$ , \*\* $p \leq 0.005$  and \*\*\* $p \leq 0.001$ . To calculate the mean rank, each response is assigned a value with the smallest observation assigned the value of 1, the second smallest observation assigned the value of 2 etc. and the average of the rankings is the mean rank (Field, 2013). For the DSO and COOP group comparison, the 12 DSO respondents in a Co-op program and the 24 COOP respondents with disability registration with the University are removed.

Within the DSO group, there was no discernable differences in responses by comorbidity for any of the WIL perception questions. However, those in the DSO group with a WIL experience are more positive about understanding accommodations in WIL. These results support that being in WIL increases awareness of the accommodations students may need in a workplace. However, the opposite result is found for the COOP group when comparing having at least one co-op work term experience. Having a work term experience increased the probability of reporting more negatively to understanding WIL accommodations. One reason for this is that that likelihood of participation in WIL is increased for respondents who are more positive about understanding accommodations in WIL. The COOP group opted to participate in WIL, so these respondents are more likely to be positive to understanding accommodations, regardless of work term level. However, a respondent's understanding of what they may need regarding accommodations may change once they have a practical experience in WIL.

COOP respondents with a co-op work term are also more negative when asked if there are sufficient services available in WIL and more negative about their comfort disclosing in WIL. Having three of the perception questions about WIL be statistically more negative for those that have had a work term experience compared to those who have not suggest that students with disabilities may not be receiving the supports they need during their co-op work terms.

Comparing the COOP responses by comorbidity finds that students who are comorbid are more negative when ranking their understanding of accommodations in WIL and more negative about their perception of employers supporting them in WIL. Furthermore, the COOP respondents who are registered for academic accommodations are more negative about employers compared to those COOP respondents who are not registered for academic accommodations. As previously reported, the DSO respondents, who are all registered for academic accommodations, are more negative about employers in WIL compared to the COOP respondents. It appears receiving academic accommodations has some influence on students' perceptions of employers in WIL. One explanation for these findings may be that students' expectations in receiving accommodations for academics (e.g., notetakers, extensions on deadlines, deferred exams etc.) may not easily transfer to employment situations, resulting in students perceiving employers as being less supportive in WIL.

*Probability of positive or negative perceptions about WIL by disability type and WIL type*

To explore further students' perceptions of WIL, the Likert scale questions were changed to response variables and ordinal regression analysis was run with disability type, comorbidity and group as the explanatory variables as reported in Table 7. An indicator for the COOP group is also included.

Students with a hearing impairment have a greater probability to report positively to both the University supporting them and their understanding of accommodations. Having a medical/chronic illness also increases the likelihood of being more positive about understanding accommodations in WIL. Students indicating a mental health disorder are less likely to be positive that they understand accommodations and they are less likely to be comfortable disclosing their disability in WIL. Respondents in the COOP group are more likely to be positive that employers are sensitive to their disability related needs. The COOP respondents also have a higher probability of being positive that they understand accommodations in WIL compared with respondents in the DSO group. As 64.13% of respondents in the COOP group have had a WIL experience (at least one co-op work term) but only 22.58% of the DSO group have a WIL experience, this finding also supports that having a WIL experience increases the likelihood of being more positive about knowing what accommodations they need/may need in WIL.

TABLE 7: Perceptions of WIL for all responses by disability type, comorbidity and group - ordinal regression.

Explanatory Variables	Employer's Sensitive	Equal Access	University Supp. Me	Sufficient Services	Under Accommod.	Comfort Disclose
ABI	0.243 (0.404)	0.131 (0.4)	0.225 (0.413)	0.431 (0.405)	0.228 (0.403)	0.234 (0.4)
ADHD	0.088 (0.318)	0.087 (0.318)	0.039 (0.326)	0.255 (0.319)	0.342 (0.321)	-0.001 (0.314)
ASD	-1.354 (0.774)	-0.828 (0.761)	-1.151 (0.78)	-0.816 (0.755)	-1.284 (0.781)	0.415 (0.755)
Hearing	-0.344 (0.848)	0.552 (0.838)	2.205* (0.898)	2.554 (0.972)	1.336** (0.878)	0.712 (0.861)
Medical/Chronic	-0.37 (0.328)	-0.582 (0.331)	-0.326 (0.336)	-0.194 (0.328)	0.771* (0.334)	-0.611 (0.325)
Mental Health	-0.55 (0.314)	-0.136 (0.311)	0.147 (0.32)	-0.456 (0.314)	-0.609* (0.316)	-0.693* (0.314)
Mobility/Dexterity	0.109 (0.522)	-0.527 (0.525)	-0.458 (0.537)	-0.696 (0.521)	-0.781 (0.525)	0.514 (0.521)
Specific LD	0.075 (0.398)	0.243 (0.395)	0.023 (0.408)	0.526 (0.398)	0.539 (0.407)	0.345 (0.398)
Vision	-0.417 (0.504)	0.274 (0.51)	-0.107 (0.512)	0.539 (0.503)	0.054 (0.501)	0.272 (0.497)
Comorbid	-0.178 (0.264)	-0.067 (0.262)	-0.293 (0.271)	-0.107 (0.263)	-0.115 (0.264)	0.059 (0.261)
COOP group	1.46*** (0.316)	0.421 (0.299)	0.421 (0.309)	0.735 (0.303)	0.375* (0.301)	-0.562 (0.299)

n = 242

*Note.* The first row of numbers for each explanatory variable are the regression coefficients and the numbers in brackets below are the standard errors. The following symbols indicate statistically significant differences in rankings of the WIL perception questions for \* $p \leq 0.05$ , \*\* $p \leq 0.005$  and \*\*\* $p \leq 0.001$ .

#### *Students with Disabilities Disclosure Rates in University*

The COOP group was asked if they had disclosed their disability to the University for academic accommodations. This question provided an opportunity to learn how many respondents who have a disability registered in a co-operative education program have disclosed to the University. The DSO group is not included in this analysis as all respondents in the DSO group have disclosed to the University. Of the 92 COOP respondents, 23 selected "yes" (one skipped the question) to being registered for academic accommodations. This means that 75% of respondents in the COOP group did not register their disability for academic accommodations. It was previously noted that 23 students had disclosed their disability to the Co-operative Education Office at the time of the survey. Unfortunately, as the survey was anonymous, it is not possible to determine if the same 23 students who disclosed their disability to the Co-operative Education Office also disclosed to the University to

receive academic accommodations. The University recently published a report that only 25% of students who had met with a professional about a mental health concern registered to receive academic accommodations with the University. Our results support the campus-wide data that a mere one quarter of students with disabilities have disclosed to the University; therefore, three quarters of students with disabilities in a co-operative education program are not receiving any support in their academics nor their co-op work terms. This has far-reaching consequences for higher education in Canada.

#### *Requesting Accommodations in Work-Integrated Learning*

Table 8 provides the frequency of 'yes' and 'no' responses to the question: "Have you asked for accommodations for your disability as it relates to your participation in WIL". This analysis includes all respondents who have a WIL experience (respondents who are not in WIL or have not experienced a co-op work term are excluded from this analysis).

TABLE 8: Comparing response percentages by group for the question: "Have you asked for accommodations for your disability as it relates to your participation in WIL?"

Asked for WIL disability accommodations	All respondents with WIL experience	All respondents minus DSO and those registered for support †	All DSO who engaged in WIL	DSO who engaged in WIL (other than those in a Co-op program)	All COOP who completed a Work Term	COOP who Completed a Work Term - not registered for academic supports
Yes (%)	26.3	23.2	40*	40**	16.9	10.3
No (%)	73.7	76.8	60	60	83.1	89.7
N	99	69	40	30	59	39

*Note.* † All respondents with WIL experience minus DSO in Co-op program and COOP registered for academic supports. The following symbols indicate statistically significant differences for asking for accommodations between the two groups for \* $p \leq 0.05$ , \*\* $p \leq 0.005$  and \*\*\* $p \leq 0.001$ .

When all responses with WIL experience are included, 26.3% selected 'yes' to asking for disability accommodations in WIL. Analysis by survey group finds that DSO respondents are statistically significantly more likely to ask for accommodations compared with the COOP respondents. Only 16.3% of the COOP respondents asked for accommodations in WIL. On the other hand, 40% of the DSO respondents asked for accommodations in WIL. The analysis is conducted a second time removing those DSO respondents registered in a co-operative education program and those COOP respondents who had registered for academic accommodations. The frequency of asking for accommodation in WIL held at 40% for the DSO respondents. However, the COOP respondents who asked for accommodations in WIL dropped to 10.3% indicating some influence on asking for accommodations due to receiving academic accommodations from the University.

#### DISCUSSION

Even though the data was collected from only one University, there is research supporting that the rates of students with mental health challenges is prevalent across Canadian universities. A recent national health survey of Canadian students in post-secondary reported 23.7% of students were diagnosed or were being treated for anxiety and 19.1% were diagnosed or being treated for depression in the previous twelve months (American College Health Association, 2019). It is not surprising that Canadian universities and colleges report that they are managing a mental health crisis on their

campuses (MacKean, 2011). For the demographic 15 years of age to 24 years of age, 13% indicated they are living with a disability and 77% of those had a mental health related disability and/or a learning disability (Morris et al., 2018). The differences between students with disabilities and students without disabilities are the same across all Canadian universities, and this research uncovers very interesting, generalizable findings, despite the fact that the sample is from one university.

The results provide strong evidence that the presence of having a mental health disorder significantly reduces the likelihood of engaging in WIL. Negative perceptions that employers will support their disability-related needs also reduced the probability of being in WIL. Students with mental health disorders are also more likely to report a lack of understanding about accommodations in WIL. As WIL continues to grow to meet government directives, providing supports for students with mental health disorders will be imperative for them to be able to access the programs that support their transition from school to work. If not, the largest cohort of students with disabilities on university campuses will be disadvantaged compared to their non-disabled peers when they enter the labor market upon graduation. Those in WIL also have a higher probability to be negative that students with disabilities have equal access to WIL, suggesting that students are experiencing challenges as they participate in WIL. More research is needed to explore this counter-intuitive result. Having more than one disability (comorbidity) may also be a barrier to entry to an optional co-operative education program, as is having a mental health disorder, specific learning disability, ADHD or mobility/dexterity disability. To be an accredited co-operative education program, students must be paid; however, internships, field experiences and mandatory professional practices are often unpaid, leaving the potential for students with these types of disabilities and/or more than one disability to be at a financial disadvantage if co-operative education is not accessible.

Students with disabilities in WIL are not requesting accommodations, report a lack of understanding about the accommodations they need in WIL and respond more negatively that they are comfortable disclosing in WIL. In fact, 80% to 90% of students with disabilities in a co-operative education program, who are working in full-time paid employment situations, are doing so without accommodations for their disabilities. The COOP group is also more positive about employers but less likely to be comfortable disclosing in WIL and less likely to ask for accommodations. One potential explanation for this is that accredited co-operative education programs are full-time and paid experiences in a workplace and may not be as flexible as other forms of WIL that are unpaid and/or reduced hours. Furthermore, other forms of WIL are often embedded in the Academic units like mandatory professional practices, field experiences and internships which may provide different access to supports. This warrants further study. Another interesting finding is that those who registered their disability for academic support are significantly more likely to ask for accommodations. These findings suggest that receiving guidance to ask for accommodations in an academic setting may be a transferable competency to WIL.

#### *Policy Recommendations*

From a policy perspective, the governing body in Canada, Co-operative Education and Work-Integrated Learning Canada (CEWIL), mandates that co-op work terms be a minimum of 35 hours per week to receive official Co-op accreditation (Co-operative Education and Work-Integrated Learning Canada, 2019). Hiring students from an accredited program helps employers qualify for the Ontario Co-operative Education Tax Credit (similar credits are offered in other Provinces) (Government of Ontario, n.d.). Requiring full-time hours for co-op work terms may be a systemic barrier to participation for students with disabilities, especially for those with mental health disorders. Flexible and reduced hours

is the most common work modification for this disability type (McDowell & Fossey, 2015) and providing accommodations promotes a workplace culture of inclusivity for mental health related disabilities (Rotenberg et al., 2016). Youth with psychological disabilities transitioning into employment were most likely to report the need for soft accommodations (e.g., flexible work schedules, assistance with self-management) and health benefits (e.g., prescription drugs, counseling appointments) compared to other types of disabilities (Jetha et al., 2019). Co-operative education policy modifications allowing for flexible and/or reduced hours may increase participation in WIL for students with disabilities. In addition, Co-operative Education tax credit requirements need to be modified in kind to ensure employers can accommodate students without financial penalty. Likewise, field experiences, mandatory professional practices and internships should include accommodations for flexible and reduced hours, especially if there is a threshold of mandatory WIL hours to receive a certification, diploma, or degree. Policy ensuring students can qualify and have access to health benefits during the periods they participate in a WIL activity may also increase participation rates for students with disabilities.

The results sadly show that those who have engaged in WIL are more likely to be negative that sufficient services are available for them to succeed in WIL. This was particularly evident regarding comfort disclosing and knowledge of the accommodations they may need in a co-operative education program. In addition, policies to ensure that universities and WIL employers are offering accommodations to students with disabilities in WIL is also required, especially for students in unpaid, precarious work situations as they may be particularly vulnerable.

On a positive note, the findings from this research support that students with disabilities who have had a WIL experience do have an increased capacity to understand what accommodations they need in WIL and report feeling more comfortable to disclose in WIL compared to students who have not had a WIL experience. Another notable finding from this research is the impact of their perception of employer support for their disability-related needs and their likelihood of engaging in WIL. Higher education relies on finding WIL employers that share similar values on inclusivity (Peach et al., 2016). Strategically, recruiting WIL employer partners who provide accessible workplaces may support Canadian universities to increase participation in WIL for this demographic. Moreover, WIL employers can help students to self-advocate for accommodations by promoting the benefits of disclosure in their workplace (Lindsay et al., 2018) and employers can build their competencies in supporting workers with disabilities by hiring this cohort (Lindsay et al., 2019).

## CONCLUSION

This research is beneficial in that it provides evidence that students with disabilities are not participating in WIL, especially those with mental health disorders. Students with disabilities are struggling with understanding the accommodations they require and overcoming their discomfort in disclosing their disability in a WIL setting. Future research is needed to confirm if these results are similar at other universities in Ontario and the rest of Canada. Additional specifications for severity of disability and other background characteristics would be beneficial to examine how the intersectionality of identity impacts WIL engagement rates. Research examining WIL experiences by specific mental health disorder (e.g., depression, bi-polar, anxiety, etc.) may also increase our understanding of the appropriate accommodations required to succeed in WIL. To our knowledge, no other research has analyzed the likelihood of participating in WIL and students' perceptions of WIL by disability characteristics. As such, this research is exploratory in examining trends that have never been researched before. Future studies should implement a priori hypothesis and control for multiple

comparisons (e.g., participation levels and perceptions of supports for students with and without a disability). These results add more insights into the relationships between disability characteristics, WIL participation rates and perceptions of WIL for this demographic. As universities grow their WIL programs, addressing the outcomes of this study can increase WIL participation rates for students with disabilities so they can gain the experiential learning needed to transition to labor market participation when they graduate.

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APPENDIX A: WIL type selected by survey group.

WIL Type	DSO (n = 42)		COOP (n = 92)	
	Count	% within Group	Count	% within group
Internship	18	36.73	5	5.1
Co-op	12	24.49	92	93.88
Field Experience	11	22.45	1	1.02
Mandatory Prof. Practice	6	12.24	0	0
Other	2	4.08	0	0
Total Selections	49		98	

*Note.* Indicates frequency by type of WIL by group. In some instances, students selected more than one WIL type resulting in a higher number of selections than survey numbers.

APPENDIX B: Co-op level completed or process of completing.

	DSO Count	DSO % within Group	COOP Count	COOP % within Group
First Year	0	0	10	10.87
Prep Course	2	16.67	23	25.00
Work Term 1	3	25.00	11	11.96
Work Term 2	4	33.33	18	19.57
Work Term 3	1	8.33	13	14.13
Work Term 4	0	0	11	11.96
Work Term 5	2	16.67	6	6.52
N	12		92	

*Note.* First Year is any student in academic semester 1 and 2 that has not yet started the mandatory co-op prep course at the time of the survey. Students are required to pass this course before they begin their first co-op work term. Each work term is 4 months. Depending on discipline, students are scheduled to complete 3, 4 or 5 work terms.

APPENDIX C: University 2019 disability types registered on campus for academic accommodations.

Disability Type	Frequency (%)
Acquired Brain Injury (ABI)	6
Attention Deficit Hyperactive Disorder (ADHD)	8
Autism Spectrum Disorder (ASD)	2
Hearing Impairment	2
Medical/Chronic Illness	11
Mental Health Disorder	46
Mobility/Dexterity	2
Specific Learning Disability	22
Vision Impairment	1

*Notes:* Data indicates the frequency by type of disability registered with the Disability Office on campus. The rates of comorbidity were not available.