

A Framework of Competence in the University Experience of Students with Disabilities

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Abstract

Liberal education is an approach to learning that allows students to learn practical skills to help deal with the challenges and diversity in the world. Liberal education is important to students with disabilities (SWD) in postsecondary education because of their increased difficulty to secure employment compared to students with no disabilities (SWND). In this study, a survey was conducted using questions that referred to practical skills and designed in a Likert Scale format with responses ranging from 1 (not very much) to 4 (very much). The survey was adapted from the employability skills profile created by the Conference Board of Canada, which is an organization that provides research and insights to complex challenges and issues in the education sector. The questions were grouped in five areas of development: intellectual, personal, interpersonal, academic, and human and civic engagement. The responses of each question were converted into sum scores and grouped within each area of development. The data was then dichotomized while using the median for comparison. The differences between students and their different years of study and the differences between genders were also observed. There was no statistical difference between SWD and SWND. Generally, both groups reported they felt improvement in practical skills from their university experience. In the intellectual area more SWD did not see improvement overall, however, more SWND did find improvement in learning practical skills. No significant difference between students in different years of study were found, however, the trends show that students learn practical skills early in their second year. No significant difference between the responses of genders were found, however, the trends showed that more females are finding improvement than males in learning social skills. The conclusions are that the University does generally provide opportunities for all students to learn practical

skills. However further research is needed to investigate the possible differences, gather more participants, and ask more specific questions.

A Framework of Competence in the University Experience of Students with Disabilities

Education, specifically liberal education, continues to become increasingly important with global challenges and local challenges that the current generation of undergraduate postsecondary students will need to tackle (Nitkin, White, & Shapiro, 2016). According to them, liberal education is necessary in providing skills and tools for graduates in the workforce. Wismath, Orr, & Zhong (2014) present certain key skills that students gain from attending postsecondary institutions, including problem solving skills and critical thinking, creativity and innovation, and collaboration and communication. Liberal education is especially important to students with disabilities because of the increased difficulty it is to secure employment compared to those who do not have disabilities. In 2012, the unemployment rate of people aged 25 to 64 in Canada was 11%, compared to 6% of people who did not have a disability (Turcotte, 2014). Because of the higher likelihood of not securing employment, more people with disabilities are enrolling in postsecondary education in order to learn these necessary skills. However, a problem that arises is the need to incorporate the increase in numbers of students with academic disabilities and how to make sure they acquire these skills.

Within the past 20-30 years, the population of postsecondary students with registered disabilities has increased considerably within universities and colleges. In 2016, Canadian postsecondary institutions reported 2, 034, 957 total enrolled students compared to the 800, 000 students enrolled in the 1960s (Stats Canada, 2018; Goldenberg et al., 2010). 6%-10% report having disabilities that directly restrict their learning. These disabilities include physical, neurological, psychiatric, and specific learning disorders (Gellego & Busch, 2015). Only 14% of students with disabilities in postsecondary institutions graduated with a certificate, diploma, or bachelor's degree (compared to about 51% of the students without disabilities who graduated)

(Statistics Canada, 2018; Timmerman & Mulvihill, 2015). With more students with disabilities (see Appendix 1 for types of disabilities) enrolling in postsecondary education, institutions have developed programs and services to change this by providing help (e.g. accommodations) to give them an equal opportunity in higher education.

Postsecondary students in Canada with disabilities are now protected under the Alberta Human Rights Act and the Alberta Human Rights Commission, which provide laws that prohibit discrimination against a student whose physical or mental disability substantially limits one or more major life activities such as learning (Alberta Human Rights Act, 2000; Alberta Human Rights Commission, 2010). This means that institutions must provide accessible and learning accommodations and other services for students diagnosed with disabilities. These are to help students with disabilities find equal opportunities at academic success. Since the enactment of these laws, students have been able to access the necessary accommodations and their grades have generally improved (Reinschmiedt et al., 2013). These services include providing exam and in-class accommodations, strategy training, and the use of assistive technology like text-to-speech software. Since 25 percent of the population of students enrolled with disabilities register for these services in Canada, it means that these institutions are working to help find academic success for these students (Gellego & Busch, 2015). Trammell (2003) found that postsecondary students who used provided accommodations and other services had increased their GPA score by at least a 0.1 (on a 4-point scale) compared to the years before. Kim et al. (2016) found similar results with a GPA increase but found the average increase was 0.8 (some as high as 1-point increase). This is one of the main reasons services like this (e.g. the University of Lethbridge's Accommodated Learning Center) exist.

Although it is important to see the final grades as a significant measure of the effectiveness of these services, there is more to any student's experience with postsecondary education than grades (Kim & Lee, 2016). Chow (2005) studied the experiences of students at the University of Regina, specifically the effect the University had on the student's overall well-being and positive or negative experiences, and found that students were quite satisfied with their lives and their academics associated with positive learning experiences. Even when the experiences for most of these students were challenging (e.g. tough class schedules, difficult assignments, and stress with exams), there was still overall satisfaction. These students perceived themselves as successful, with high self-esteem and good relationships and connections with friends and professors. These students also felt themselves grow intellectually, and most were able to achieve their desired grades.

However, some students in Chow's (2005) study still struggled to have this positive learning experience and maintain positive well-being, despite all the services and programs that were available from the University to help. Some of these students were those diagnosed with disabilities. Their disabilities restricted them from being able to work and study like other students. This made it extremely difficult to keep up in class and with assignments and affected their relationships with classmates and professors. Disabilities restricted students from their career and life goals; they were a major determining difference between a positive learning experience and a negative one. It is for this reason that it is so important that services are provided to give students with disabilities a more equitable chance in higher education compared to the rest of their classmates (Barnard-Brak et al., 2011).

Even with laws on accommodation, society still limits and constrains individuals with disabilities through an environment that creates attitudinal, physical, and social barriers (Hindes

& Mather, 2007). Individuals with disabilities must deal with social stereotypes and discriminatory attitudes (Timmerman & Mulvihill, 2015). Sometimes, students hesitate to use accommodations because they are afraid of standing out or being “obviously” different from their classmates. These negative perceptions have detrimental effects on the individual’s social-educational experience by creating further barriers to their participation in postsecondary institutions (Hindes & Mather, 2007). In this case, the accommodation services may increase the student’s perceived stigma rather than reducing it.

From the University’s perspective, one of the goals of postsecondary education is to improve skills necessary in the workplace in their students. These skills include the fundamental skills of communication, managing information, using numbers, thinking and problem solving; personal management skills of demonstrating positive attitudes and behavior, being responsible and adaptable, learning continuously; and teamwork skills (The Conference Board of Canada, 2020). Universities strive for more than just grades for their students but want them to build confidence in these skills through intellectual, academic, and personal development and through humanitarian and civic engagements.

At the University of Lethbridge, this framework of competence has been incorporated into their own “four-pillar-approach” of Liberal Education. This approach includes: 1. breadth across disciplines to expose students to studying the world beyond their own disciplinary boundaries, 2. the ability to connect and integrate knowledge across disciplines, 3. an emphasis on critical thinking and problem-solving skills, and 4. Education for citizenship, which encourages civic engagement (School of Liberal Education, 2020)). With this approach, the goal of the University of Lethbridge is to build a better society and inspire minds through free and critical inquiry and excellence, prepare students for their personal and professional paths,

encourage and nurture creative expression, and pursue community engagements (Undergraduate Calendar and Course Catalogue, 2019). The idea is to build skills beyond the academic scope of grades, tests, and assignments, but to improve competence in these skills.

A potential next step for postsecondary institutions then is to identify the effect their services and learning programs have on students, particularly those with academic disabilities, from the student's perspective. According to Reinschmeidt et al (2013), this is essential to increase the effectiveness and appropriateness of these services. Knowing the student's perception will help indicate if the University's services, teaching, and learning styles/programs improve competence. This broader view will give us a better idea of the effectiveness on the whole University learning experience. Chow (2005) investigated the perspective of students with disabilities through interviews and questionnaires. He found that the students demonstrated a positive attitude toward the accommodative services, as many students felt they could not succeed academically without them. However, a common struggle with these students was maintaining an overall good well-being (physical, mental, and emotional health).

Even with the access to services like accommodations, students needed to sustain higher levels of self-efficacy and independence to obtain the right accommodations and to communicate with their professors. They also needed to spend more time on studying and assignments while sacrificing time spent with friends and family, and to deal with negative and poorly informed perceptions regarding the use of accommodative services by both their professors and peers (Hindes & Mather, 2007). Many of the students interviewed were going through depression. Most students had suffered stigmatizing effects of their disability since childhood. In this case, levels of competence were hindered rather than strengthened. However, not all the students struggle with the negative side-effects of their disabilities. With the use of accommodative

services (and most likely other skills), some students were still able to perceive themselves as successful and competent (Chow, 2005).

The purpose of this study is to examine the career progress in practical skills that students learned from liberal education in the University of Lethbridge, particularly those students with academic disabilities. For this study, academic disabilities would include any disability that has a direct hindrance to a student's learning ability (e.g. including but not exclusive to learning disabilities, neurological disorders, mobility issues, blindness and deafness). The aim is to measure the effects of the University learning experience of students with academic disabilities (not just the grades), and to what extent the University creates a framework of competence for the students. To find out more about this, a questionnaire needs to be given to postsecondary students to analyze whether the University learning experience is in fact creating this sense of competence for the students. The main research question is, are students with academic disabilities acquiring practical skills similar to students without academic disabilities? Two secondary research questions include, do students acquire practical skills the longer students are in University, and does the acquisition of practical skills differ between male and female experiences?

The expectation was that students who have had longer experiences in the University would find more improvement in these practical skills than less experienced students because they would have had more time to familiarize with the University and engage in more activities than the younger students. Klegeris, Dubois, Code, & Bradshaw (2019) found that students generally find improvement in skills by their third year of study in university. They specifically focussed on the improvement of problem-solving skills and found that students feel more improvement by their third year, which was also evident in the experiment tests. Although this

research was testing more skills than only problem-solving, the expectations were to find similar results.

The University experience is also not the same for all, even a small university like the University of Lethbridge is quite heterogeneous, but there are more female student enrolments (5,206) than male students (3,589) (University of Lethbridge, 2019). Over the last 30 years, there has been a dramatic gender shift in Canadian Universities where now more females than males have enrolled in postsecondary education. By 1991, females comprised of 51% of graduates and have had higher enrollment rates from then on. While more females are enrolled, they are taking advantage of the many different opportunities for education. Frenette & Zeman (2007) found that more than 76.8% of the difference in university participation rate can be accounted for by differences in observable characteristics between genders. Females at an early age tend to have higher school marks, higher standardized test scores, better study habits, and much higher parental expectations. They also found that females start at an early age to become more open to new social opportunities than males do. These social opportunities include internships, volunteering, engaging in broader disciplines, and participating/leading in clubs (Frenette & Zeman, 2007). Because of this, the expectation is that there will be similar results in this research in the University of Lethbridge.

Methods

Participants

Participants for the survey (n=149) were students (38 males, 110 females, and 1 unspecified gender) from the University of Lethbridge. Each participant had met the survey requirements, which was that they must be in at least their second year of study and be registered in Psychology courses that allowed access to the Sona system (this does not mean that all

participants were Psychology majors, just that they took Psychology courses). Each participant received 1% course credit for their participation. Age of the participants was not recorded so the range of ages is unknown, however, the institutional analysis for the University of Lethbridge states that the average age of undergraduate full-time students is 22 years (University of Lethbridge, 2019).

Materials

The survey consisted of 30 questions. These questions were constructed in a way that represented five areas of development that were derived from the Conference Board of Canada. The Conference Board of Canada is an organization that provides research and insights to complex challenges and issues. They also help inform and improve Canada's education and skills sectors through evidence-based research and analysis. Their profile included: fundamental skills (e.g., communication and problem-solving), personal management skills (e.g., responsibility), and teamwork skills (Conference Board of Canada, 2020). The profile was modified in the survey on the advice of the Human Subjects Research Ethics officer, expanding it to five areas of development so that each skill analyzed was explicitly different from one another.

The five areas of development in the survey were intellectual development, personal development, interpersonal development, academic development, and humanitarian and civic engagement. Each area contained six questions relevant to the area of development. The survey also included three demographic questions, which targeted participant gender, if participants had an academic disability (or not), and what year of study the participants were in. The question on whether the participant had a disability was what determined whether the participant was in the control group (students without disabilities) or the experimental group (students with

disabilities). While using the information from the Conference Board of Canada, the questions were modified for the survey in a Likert scale format (see survey in Appendix 2). However, psychometric properties have not been tested for this survey, and this information was not found in the Conference Board of Canada's profile.

Procedure

Participants were in Psychology courses that allowed access to the Sona system, where participants can access research experiments to participate in. It is where the survey was created and available so that participants could access it. Participants were then assigned to one of the two groups based on their response on whether they had a disability or not. Once their response was given and the other demographic questions were answered, the participant could then begin the survey. In each area, the questions asked participants how they felt their experience in the University has helped improved certain skills in relation to their areas of development. Once the survey was completed, the participants received 1% course credit.

Results

The question for this research was: *“Are there differences between students with and without academic disabilities in improvement in intellectual development, personal development, interpersonal development, academic development, and human and civic engagement”*? One-hundred forty-nine (149) students were surveyed and determined whether those with academic disabilities (SWD) (N1 = 23) differ from those without academic disabilities (SWND) (N2 = 126) on each of the five measures of development. Due to the several comparisons on the same data, a more conservative cut-off value of $p < 0.01$ was adopted.

Summative Data for all Subjects

To obtain the summative data, the sum score of the participants survey responses were taken and compared them with the median of those responses. The sum scores at or above the median show improvement in the area of development, and the sum scores below the median do not show much improvement. By doing the comparisons in this manner, it would provide a more meaningful comparison because the median acts as a specific cut-off point that shows a clear line of what was consider as improvement or not. Since the median is the middle score, it will not be as affected by lopsided data (outliers). These sum scores were used for all data analysis in this research. The summative data show that generally, more students were showing improvement in the areas of development, except for the humanitarian and civic engagement area (see Figure 1).

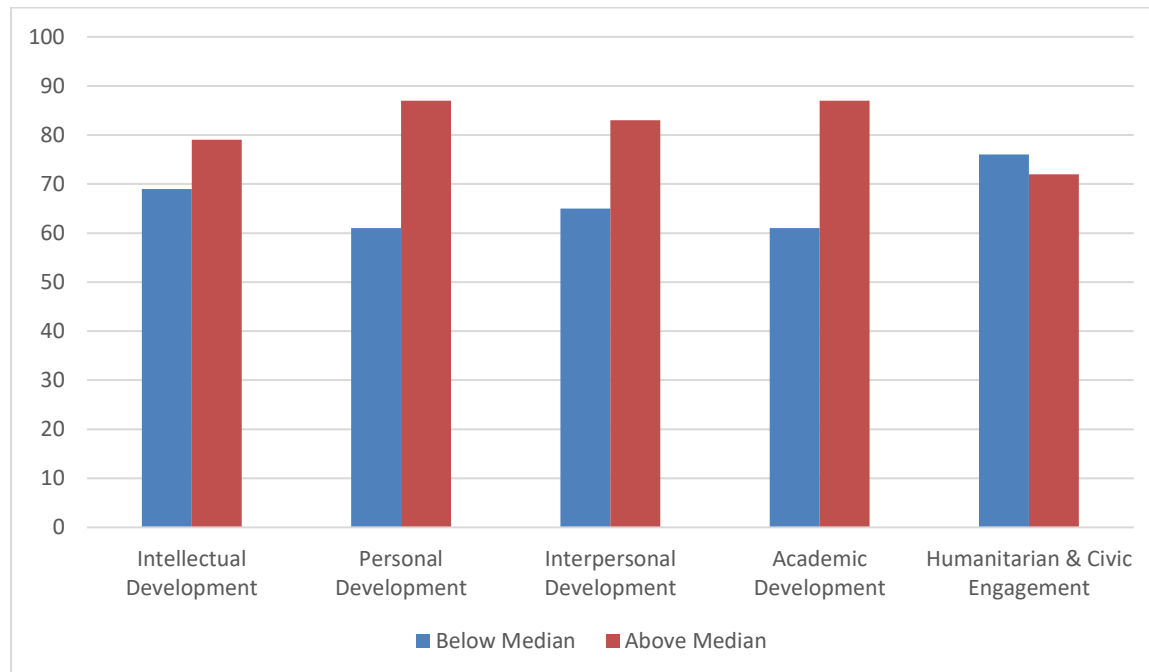


Figure 1. Student Improvement in Skills within the Five Developmental Areas. *Below* the median are those who scored below the median, and *Above* the median are those who scored equal to and above the median of each developmental area. $N = 149$.

From this data, there were a lot of different questions, and though summarizing it gets us the grouping that was needed for the comparisons, there are interesting pieces of information in these details. As mentioned before, the participants answered the survey on a Likert scale (from 1 (not very much), to 4 (very much)). The data shows that some skills are higher (or lower) than others in terms of students finding improvement (see Appendix 3). The skill that most students found improvement in was recognizing that others have different points of view (the mean response was 3.64 (SD = 0.66)) and understanding the importance of equality (the mean response was 3.20 (SD = 0.91)) and cultural diversity (the mean response was 2.96 (SD = 0.95)) are in the top five skills learned. This suggests that a major influence the University has on students is helping them be more accepting of everyone. The data also showed that the lowest skill learned was finding opportunities for philanthropy (the mean response was 1.98 (SD = 0.98)), and that finding volunteer opportunities (the mean response was 2.47 (SD = 1.10)) and opportunities to advocate for someone/something (the mean response was 2.56 (SD = 0.96)) are in the bottom five skills learned. This suggests that the University does not have a strong influence in teaching students to help and serve others. Most of the responses of the questions are found in the 2.5 to 2.9 ranges (2 = somewhat, 3 = much).

Comparison Between SWD and SWND

The independent measure was the presence of a disability, which included two groups: SWD and SWND. These groups were compared on the dependent measures, which were the five areas of development. The data were frequency-weighted to make the groups relatively proportional, as the sample size of students without disabilities was larger than that of those with disabilities. Frequency-weighted scores were created by dividing 50 by the percentage value of each group (those with versus without disabilities). All Chi-square analyses were performed on

the weighted data. Five separate Chi-square analyses were performed to compare the two groups on the five dependent measures (the developmental areas).

The results of the Chi-square analysis comparing the differences between students with and without disabilities for each developmental skill are presented in Tables 1. The results showed that there was no significant difference between SWND and SWD groups on any of the developmental areas at the $p < 0.01$ level (although the results in the intellectual developmental area did approach significance) (see Table 1).

Table 1.

Chi-Square Comparisons between Y/N to Disabilities and Students Above/Below Median of Improvement in the Five Developmental Areas

Area of Development	SWD		SWND		X ²	p - value
	Above	Below	Above	Below		
Intellectual	32	42	43	32	2.958	0.04
Personal	39	36	46	29	1.330	0.12
Interpersonal	39	36	44	30	0.840	0.18
Academic	39	36	47	28	1.744	0.09
Human & Civic Engagement	36	39	39	35	0.330	0.28

Note. SWD = students with academic disabilities, SWND = students with no academic disabilities. These frequencies are generated from weight cases of the original frequencies (SWD = 3.239, SWND = 0.591).

Comparison Between Years of Study

The second research question asks whether there were differences in the improvement of the five developmental areas between students in different years of study (2nd year, 3rd year, 4 or more years). A Chi-square test was used to examine their differences, and none were statistically significant, all p -values are greater than 0.01 (*see Table 2*). These results indicate that there was no overall difference in any of the developmental areas between students in different years of

study. Consequently, the differences between the specific groups were not examined (or no pairwise comparison analysis was performed).

The frequencies indicate that as students move from one year to another, their scores (the scores are the numbers listed as *above* or *below* the median) for each of the developmental measures did improve somewhat. However, these improvements were not statistically significant.

Table 2

Chi-Square Comparisons between Year of Study and Students Above/Below Median of Improvement in the Five Developmental Areas

Area of Development	2 nd Year of Study		3 rd Year of Study		4 or More Years of Study		X ²	p - value
	Above	Below	Above	Below	Above	Below		
Intellectual	35	33	26	18	19	13	0.871	0.32
Personal	44	24	24	20	17	15	1.733	0.21
Interpersonal	41	27	25	19	17	15	0.476	0.39
Academic	41	27	25	19	22	10	1.146	0.28
Human & Civic Engagement	34	34	21	23	19	13	1.106	0.29

Note: No weights were added to these frequencies. There were also no significant differences.

Comparison Between Genders

A third research question asks whether there were gender differences in the improvement of the five developmental areas. A Chi-square test was again used for the analysis. There were 38 males and 110 females for all analyses. Because there are far more females than males, they were weighted by their sample size. The weighted scores were created by dividing 50 by the percentage value for each gender. The results of these analyses are presented in Table 3.

There was no significant gender difference in any areas of development, all *p*-values were greater than 0.01 (see Table 3). The analysis did approach significance in the human and civic engagement area, but still no significant difference. However, the frequencies show that females did find improvement in the areas of development more than males.

Table 3

Chi-Square Comparisons between Gender and Students Above/Below Median of Improvement in the Five Developmental Areas

Area of Development	Male		Female		X ²	p - value
	Above	Below	Above	Below		
Intellectual	37	37	42	32	0.679	0.21
Personal	41	33	46	28	0.697	0.20
Interpersonal	37	37	46	28	2.222	0.07
Academic	39	35	48	26	2.259	0.07
Human & Civic Engagement	31	43	41	33	2.705	0.05

Note. These frequencies are generated from weight cases of the original frequencies. M = 1.947 and F = 0.672

Discussion

A major goal of postsecondary institutions is to help students beyond getting good grades and to provide liberal education necessary to improve practical skills needed in the workplace (Nitkin et al., 2016; Wismath et al., 2014). However, especially with the increase of student populations over the years, SWD might be restricted in receiving other opportunities to improve needed practical skills compared to their peers without academic disabilities (Chow, 2005; Hindes & Mather, 2007). In this study, the responses of SWD in a survey about learning skills needed in the workplace through liberal education were measured by comparing the difference of responses to SWND. From the survey results, there was no significant differences in any of the areas of development, but the area of intellectual development was the only area that was approaching significance. As expected, SWD had more students below the median meaning that more SWD did not find improvement in intellectual development, whereas SWND had more students above the median meaning more students found improvement in intellectual development

Previous studies also demonstrate that more SWD do not feel themselves grow intellectually and do not score as high in certain components included with intellectual

development, specifically critical thinking and problem-solving which are included in liberal education (Lombardi, Kowitt, & Staples, 2014; Chow, 2005). Those reports are consistent with the findings in this study that SWD might struggle in this area of development. In the other areas of development (personal, interpersonal, academic, and human and civic engagement), these findings also showed no significant differences, but did show a common trend in the frequencies that both SWD and SWND both had more students above the median, meaning that students in both groups could be experiencing improvements in these areas as a result of their University experience. The major difference in these frequencies is that there are more SWND than SWD that report improvement, so overall there may be improvement, but SWD show less improvement than SWND. However, because the data were frequency-weighted to make the groups relatively proportional due to the small sample size of the SWD group, it is difficult to say if SWD did in fact find improvement in these areas of development.

While the focus was to find out about SWD, there are important lessons about liberal education for all students. It seems that students overall are generally improving in all the areas of development. The summative data (see figure 1) of this research is evidence of this as it shows more students above the median in terms of improvement, which suggests that students are gaining the necessary skills and experience that future careers and work places are requiring. This is consistent with Nitkin et al, (2016) research survey which found that liberal education improved skills in areas involved in teamwork (e.g., leadership, decision-making, reliability, etc.), project management (e.g., research skills, organizational skills, etc.), and presentational skills (e.g., communication skills).

Another interesting finding was that understanding and recognizing that others have different views was the top skill that students found improvement in and that understanding the

importance of equality and cultural diversity were in the top five skills learned (see Appendix 3). This seems to suggest that the University has a stronger influence in teaching students to be accepting of everyone. Jubas & White (2017) also found similar findings with their study that Universities are becoming more diverse with increasing numbers of different nationalities and more accepting of broader knowledge and disciplines with the focus on liberal education. Because of this, the students are engulfed in an environment of openness and acceptance of those around them and their views and values (Jubas & White, 2017).

It is also interesting that the skills least learned were opportunities in philanthropy and volunteering opportunities and advocating for someone. This suggest that the University does not have a strong influence in teaching students to actively serve and help those around them and in the community. This does not mean that students do not engage in these activities, but that they are not finding improvements in these skills from the influence of the University. However, there is little evidence in suggesting why this is, but it could be that students generally poorer and do not have money to give. They might also be focusing on finding paying jobs to help pay for school and living expenses, making it difficult to find the time to volunteer.

Another interesting finding from this research was that students seem to be ‘getting it’ by their second year of study. This could suggest that the University is generally effective in helping students understand and find opportunities to learn these skills right from the start. It also seems that students do not take as long to embrace the University experience, even though some first year courses are big impersonal lectures (for example, the PSYCH 1000 course at the University of Lethbridge has at least 200 students registered). These results are consistent with Gilson, Gushanas, Yi-Fan, & Foster’s (2020) research. Although they had a different focus area in their study, they found through surveying 1867 students and faculty that students find general

improvement in skills (such as practical skills) early in their University experience. Through their survey, they found that a possible reason for this is because of the institution's ability for "inclusion" (Gilson et al., 2020). These results are also consistent with Holdaway & Kelloway (1987) research that showed students from many universities (including the University of Alberta) were doing better than expected, considering the large class sizes and not knowing how to work with professors. Most found professors willing and easy to talk to, even with the large class sizes (Holdaway & Kelloway, 1987). Overall, Postsecondary institutions seem to work effectively in including students in opportunities to develop skills needed for future careers, and students feel engaged early in their Postsecondary experience with these opportunities for learning.

Another important finding from this research is that there were gender differences in the areas of development. There was no significant difference in the human and civic engagement area of development, but females did report more gains in improvement while males reported less improvement, suggesting that females find more involvement and opportunities for influencing positive change and engaging within the community. These results are consistent with previous studies that also found that females show higher involvement with human and civic engagement. Smith (2005) conducted a study with 2472 females and 2157 males and found that 44% of females compared to 38.2% males reported involvement in the community (e.g., volunteer service). Trudeau & Devlin (1996) findings suggest that females have more positive attitudes and behaviors towards helping in the community. From the content of Liberal Education, these attitudes were what this research was hoping to see students gain.

Though the other areas of development showed no statistical difference, the frequencies showed that females overall find more improvement than males. However, this is difficult to

determine because the sample size for males was disproportionately smaller than females, so they were also frequency weighted. None the less, these results do show some consistency with Ferguson (2016) who suggested that females might be meeting qualification and skill requirements more than males. 35% of females obtained University degrees compared to 29% of males. 26% of females obtained a College diploma compared to 20% males. Females accounted for 58% of the total number of graduates in 2013 across Canada (Ferguson, 2016). A study from Kim & Sax (2009) found other possible reasons for the gender differences. In their study, they focused more on academics and found statistical gender differences in development (their samples were more proportional with 54% female and 46% male). They also found that females do seem to show more improvement than males because female students have more one-on-one interactions with their professors and are more involved in research (Kim & Sax, 2009).

The study by Frenette & Zeman (2007) as previously mentioned also provide the explanation that females might be more prepared and willing to engage in the many activities to acquire practical skills. They measured that 76.8% of the differences in university participation between the males and females of their sample was that females begin at an early age to have higher school marks, higher standardized test scores, better study habits, and much higher parental expectations. Because of this, females seem to come to university expecting to engage in activities to acquire the broad range of practical skills, and as a result, they are more likely to obtain these skills than males are. Another finding is that because of these characteristics, females tend to dominate majors in the humanities, and fields like psychology, education, nursing and other health professions. Males tend to major in the sciences (biology, chemistry, and physics), engineering, computer sciences, and much of the trades (although, females are “catching up”) (Mullen & Baker, 2018). Mullen & Baker (2018) explain that these differences in

majors could suggest that males and females come to university with different goals, so males often do not obtain more practical skills, but master the chosen few. There is little evidence to suggest that males are discriminated against in finding opportunities to improve practical skills.

One limitation of this study was the largely different sample sizes of the two groups (23 SWD and 126 SWND). The low numbers of SWD may not accurately reflect the population of SWD, resulting in the use of weights in the statistical analysis to attempt to analyze a more accurate representation of the population. This same limitation is found with the sample sizes of males and females. The low numbers of males in the sample may not accurately reflect the overall population of males. Another limitation was the ages of the student participants were unknown. There could be mature students (e.g., twenty-five years or older) within that sample that could attribute much of their learned skills from life experience and not just from within the University. This could affect the quality of the data as it is unclear what exactly helped participants improve or not in the five development areas. The psychometric properties of the survey are also unknown, which makes the reliability and validity of the survey uncertain. Although these limitations may affect the quality of the data slightly, it does not hinder the interpretation of the findings or the ability to generalize the findings.

Future studies can also be indicated based on the results of this study. Since SWD generally do not find improvement in the intellectual development based on the results of this study, a follow-up research could study the question of why this is. Are Universities not providing adequate opportunities for SWD to improve? If so, are these opportunities effective? Are there specific academic disabilities that make improvement more difficult than others? Additionally, future studies could research in a similar manner to the survey in this study between multiple institutions and see if there is a similar pattern.

In conclusion, although generally, there were no significant differences in students feeling improvement in practical skills between SWD and SWND, these findings give some important ideas of the trends the University of Lethbridge about the inclusion of SWD, the readiness and consistency the University and students have in learning practical skills, and the differences of gender in attributing these skills. However, there is more work that needs to be done, like finding more subjects and asking more specific questions to pick up problems.

Appendix 1

Types of possible academic disabilities.

Academic Disabilities			
Physical Disabilities	Learning Disabilities	Neurological/Neurobiological Conditions	Mental Health Conditions
Mobility/Functional Impairment	Perceptual Difficulties	Autism Spectrum Disorder	General Anxiety Disorder
Motor Impairment	Dyslexia	Attention Deficit/Hyperactivity Disorder	Major Depression Disorder
Chronic Medical/Systemic	Reading Difficulties	Stroke	Post Traumatic Stress Disorder
	Verbal Difficulties	Turrets	Borderline Personality Disorder
	Processing Difficulties	Fetal Alcohol Syndrome Disorder	Obsessive Compulsive Disorder
	Memory/Organization	Epilepsy	Panic Disorder
		Multiple Sclerosis	

Appendix 2

Online Survey Questions

Please answer the questions to the best of your ability.

Gender

- 1) Male
- 2) Female
- 3) Unspecified
- 4) Did not answer

Do you receive, or have you received, any assistance from the Accommodated Learning Center?

- 1) Yes
- 2) No
- 3) Did not answer

What year of study are you in?

- 1) 2nd year
- 2) 3rd year
- 3) 4th year
- 4) 5 or more years

Intellectual Development

1. How much do you feel you are improving in critical thinking (a practice of using different thinking skills in complex ways to engage in forms of reasoning)?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

2. How much do you feel you are improving in problem-solving (finding solutions to difficult or complex issues)?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very Much

3. Do you feel growth in interdisciplinary understanding? In other words, are you improving your knowledge in areas other than your major?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

4. Compared to when you first began as a student, do you feel your skills in research are improving?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

5. Are you finding yourself increasing in curiosity (a desire to know or learn)?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

6. Do you feel you are improving in creative skills?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

Personal Development

1. Do you feel a stronger sense of purpose in your life as a result of your experiences within the University?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

2. Are you becoming more knowledgeable with understanding yourself?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

3. How much do you feel your sense of identity developing (personality attributes, skills, abilities)?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

4. Are you experiencing personal growth (increasing confidence, becoming more proactive, developing talents) from your time at the University?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

5. As life inside (and outside) of the University can challenge you at times, do you feel yourself becoming more resilient (withstand or recover from difficult conditions)?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

6. Do you feel more confident in your abilities in decision making?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

Interpersonal Development

1. Do you feel yourself improving with your ability to build meaningful relationships?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

2. Do you feel yourself improving in collaboration/teamwork?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

3. Do you feel yourself becoming a more effective leader among your peers?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

4. Do you feel yourself improving in communication skills within and outside the University?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

5. Do you feel yourself becoming more comfortable with your day-to-day interactions?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

6. Are you developing more in emotional intelligence (processing/regulating emotional information)?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

Academic Development

1. Do you understand connections across the broad areas of knowledge between your courses?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

2. Have you learned effective study skills/strategies?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

3. Have you learned effective time management skills?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

4. Are you finding much opportunities to improve defending points of view?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

5. Do you feel yourself in more control of your own learning experiences?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

6. Are you finding ways to overcome barriers to your academic success?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

Humanitarian and Civic Engagement

1. Are you receiving opportunities to volunteer in the community?

- 1) Not very much
- 2) Somewhat

- 3) Much
- 4) Very much

2. Do you feel that you have gained responsibility to help others? In other words, is any part of your learning experience aimed toward helping others?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

3. Do you feel you are developing an understanding of the importance of cultural diversity?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

4. Are you developing an understanding of the importance of equality (the state of being equal in status, rights, and opportunities)?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

5. Do you feel you have developed something to advocate (supporting a cause, policy, people) for from your experience in the University?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

6. Do you have opportunities to participate in philanthropy (the desire to promote the welfare of others, usually in donations of money) projects?

- 1) Not very much
- 2) Somewhat
- 3) Much
- 4) Very much

Any additional comments?

[Insert comments here]

Appendix 3

Scores on a Likert scale from 1 (not very much) to 4 (very much)

	Skill	Mean	SD	Developmental Area
1	Viewpoints	3.6408	0.661	Academic Development
2	Equality	3.2042	0.914	Humanitarian and Civic Engagement
3	Curiosity	3.1549	0.987	Intellectual Development
4	Cultural Diversity	2.9645	0.952	Humanitarian and Civic Engagement
5	Motive to Learn	2.9296	0.840	Personal Development
6	Research Skills	2.922	0.953	Intellectual Development
7	Interdisciplinary Understanding	2.9155	0.775	Intellectual Development
8	Personal Growth	2.8662	0.923	Personal Development
9	Communication	2.8521	0.909	Interpersonal Development
10	Course Connections	2.8521	0.762	Academic Development
11	Sense of Identity	2.831	0.864	Personal Development
12	Resilience	2.8169	0.877	Personal Development
13	Interactions	2.8169	0.889	Interpersonal Development
14	Control of Experience	2.8099	0.793	Academic Development
15	Decision Making	2.7465	0.826	Personal Development
16	Emotional Intelligence	2.7254	0.997	Interpersonal Development
17	Critical Thinking	2.7254	0.786	Intellectual Development
18	Relationships	2.7092	0.933	Interpersonal Development
19	Responsibility	2.6972	0.870	Humanitarian and Civic Engagement
20	Problem Solving	2.6831	0.774	Intellectual Development
21	Overcome Barriers	2.6831	0.765	Academic Development
22	Time Management	2.6761	0.989	Academic Development
23	Study Skills	2.662	0.975	Academic Development
24	Teamwork	2.6408	0.839	Interpersonal Development
25	Leadership	2.5775	0.918	Interpersonal Development
26	Advocating	2.5634	0.962	Humanitarian and Civic Engagement
27	Sense of Purpose	2.4718	0.927	Personal Development
28	Volunteer Opportunity	2.4155	1.098	Humanitarian and Civic Engagement
29	Creative Skills	2.338	0.976	Intellectual Development
30	Philanthropy	1.9859	0.980	Humanitarian and Civic Engagement

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