

# An exploratory study of college and university students with visual impairment in Canada: Grades and graduation

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### Abstract

The purpose of this investigation was to explore predictors and correlates of grades and intention to graduate among junior/community college and university students with visual impairments in Canada, and to compare students with low vision to students who are blind on variables related to academic success. In all, 66 junior/community college and university students with visual impairments (17 blind, 49 with low vision) in Canada completed an online questionnaire inquiring about grades, intention to graduate, and demographic, school-related, and personal aspects. Stepwise regression, discriminant, and correlational analyses of the data revealed that

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the following variables were associated with better grades and stronger intention to graduate: higher course self-efficacy expectations, greater perceived behavioral control over graduation, reporting a single rather than multiple disabilities, and more favorable attitude toward graduation. Students who are blind and those with low vision did not differ on most variables studied although a much larger proportion of students with low vision reported having additional disabilities. Recommendations are made to enhance course self-efficacy beliefs which include, providing a campus atmosphere that is welcoming, and ensuring that students with visual impairments have adequate opportunities to dialogue with faculty and fellow students. Postsecondary student services professionals need to ensure that workshops which teach study, research, and time management skills are inclusive and accessible to students with visual impairments.

### **Keywords**

Blind, grades, intention to graduate, junior/community college, low vision, postsecondary students, university, visual impairment

Completing postsecondary education is related to employment of young adults with visual impairments (Shaw, Gold, & Wolffe, 2007). This is vital since employment of individuals with visual impairments is generally low (McDonnall, 2011). The numbers of these students in colleges and universities has increased dramatically during the past two decades (Zhou, Smith, Parker, & Griffin-Shirley, 2013). While there are numerous qualitative and first person accounts of life in college, to our knowledge, there are no data on how well students with visual impairments perform once admitted to postsecondary education. A systemic approach is needed to amplify the qualitative data in order to ascertain the current realities.

Although their concerns and needs in college can be very different, there are no comparative studies of students who are blind (e.g. use Braille, are unable to use screen magnification) and those with low visual (e.g. need magnification and large print).

The literature shows that high school grades (McKenzie & Schweitzer, 2001) and parental education (DeDonno & Fagan, 2013) are related to postsecondary grades, as are strong academic self-efficacy beliefs (Butler, 2011). Findings on the relationship of grades to other factors such as gender, age, academic obstacles and facilitators, social inclusion, full- and part-time student status, and single versus multiple disabilities are inconclusive although it should be noted that most studies deal with students with learning disabilities, and none deal with students with visual impairments (e.g. Butler, 2011; DaDeppo, 2009; Lombardi, Murray, & Gerdes, 2012).

The literature on graduation of students with disabilities is inconsistent (Herbert et al., 2014) although female students are less likely to drop out than males (O'Neill, Markward, & French, 2012). Several variables associated with grades (e.g. parental education) are unrelated to graduation, several others (e.g. self-efficacy, college experiences) are related to both, and some variables are related only to graduation (e.g. number of disabilities) (Fichten et al., 2014a). As with grades, we were unable to find studies on students with visual impairments.

### **Present study**

Our goal was to conduct an exploratory study of predictors of postsecondary grades and intention to graduate among individuals with visual impairments. The following questions guided the study.

- Do students with low vision and those who are blind differ on aspects related to postsecondary academic success?
- Do male and female students differ on variables related to academic success?
- Do students with a visual impairment only and those with multiple disabilities differ?
- What are the best predictors of graduation and grades?

## Method

### *Participants*

A convenience sample of 66 students with visual impairments attending 38 different Canadian postsecondary education institutions participated. Of the 64 those who answered this question, half (i.e. 33) were pursuing a bachelor's degree, 17 a junior/community college certificate/associate's degree, and 14 a graduate degree; there was no significant difference between students who self-identified as blind and those with low vision. Approximately, 90% of participants were full-time students and were registered for campus disability-related services.

As in Zhou et al. (2013), participants self-reported as being totally blind or having low vision: 17 were blind (10 females and 7 males) and 49 had low vision (24 females and 24 males, 1 did not indicate). Mean age was 31 years (median = 27). There was no significant difference between males and females or between students who self-identified as blind or having low vision. Most students in both groups were enrolled in the social sciences. In all, 38% of the sample reported having at least one additional disability/impairment: 12% of those who were blind and 47% of those with low vision.

### *Procedure*

The entire research protocol, including participant recruitment and informed consent, was approved by the Dawson College's Human Research Ethics Committee. Students were recruited as part of a larger study looking at graduation of Canadian college and university students with a variety of disabilities (Fichten et al., 2014b). We recruited students by sending invitations to current and former postsecondary students with disabilities who had participated in our previous investigations and indicated that they can be contacted for future studies. We also emailed announcements to discussion lists focusing on Canadian postsecondary education and to project partners (mainly student and campus disability service provider groups). The announcement indicated that we were seeking junior/community college and university students and former students who had graduated or dropped out of a program of study (i.e. diploma, certificate or degree program) during the past 2.5 years to complete an online survey. Potential participants above 18 years who were interested were directed to a website where they were provided with the survey's information and consent form. This form and the procedure were approved by Dawson College's Human Research Ethics Committee. Participants clicked the "Continue" button to signal consent.

Participants completed an accessible online questionnaire which asked about gender, age, and parental education and provided a checklist of 14 disabilities/impairments. Questions also asked about grades, full- or part-time status, registration for campus disability-related services, qualifications/credentials pursued (e.g. Bachelor's degree, college diploma), type of institution (junior/community college or university), and hours worked during the academic year.

The measure also contained the College Experience Questionnaire (CEQ) (Fichten, Jorgensen, Havel, & Barile, 2006) which has subscales to evaluate whether specific aspects made the

participant's postsecondary studies harder or easier: Personal Situation (e.g. study habits, financial situation) and School Environment (e.g. level of difficulty of courses, availability of computers on campus); two subscales of the Self-Efficacy Questionnaire (Solberg et al., 1998), which measure how confident respondents are that they could successfully enact various behaviors: Course (e.g. take good class notes) and Social Self-efficacy (e.g. talk to your professors/instructors); and the Campus Climate Social Alienation measure (e.g. I find myself lonely and lost on this campus) (Wiseman, Emry, & Morgan, 1988).

To evaluate thoughts and feelings about graduation, we used the Theory of Planned Behavior (Ajzen, 2002) based measures of Intention to Graduate (e.g. All things considered, it is possible that I might not complete my program of study), Attitude (e.g. Completing my program of study will be very punishing to very rewarding), Subjective Norms (e.g. Most people who are important to me think that I should complete my program of study), and Perceived Behavioral Control (e.g. It is mostly up to me whether or not I complete my program of study) (Fichten et al., 2014b).

## Results

### *Low vision only versus blind-only groups*

Comparison of scores of students who indicated only that they were blind and those who indicated having only low vision (i.e. reported no other disability/impairment) on variables listed in Table 1 showed only that students who are blind experienced less Campus Climate Social Alienation than those with low vision,  $t(39)=2.22$ ,  $p<.05$ ; even this difference disappeared when we applied Bonferroni correction to the alpha level. Moreover, none of the  $t$ -tests or Chi-Square results was significant when we compared scores of males and females.

The 53% of students who were blind and the 41% with low vision who worked did so for an average of 19 hrs per week (range=2–40). Chi-Square tests showed no significant differences. Given the non-significant results, we combined scores of males and females as well as those of students who indicated they were blind or had low vision but no other disabilities/impairments into "Visual Impairment Only."

### *Reporting a visual impairment only versus multiple disabilities*

In all, 62% of participants reported only a visual impairment, 20% reported a second disability/impairment, 8% a third, 8% a fourth, and 3% a fifth. The most common were as follows: neurological impairment, chronic health impairment, learning disability, and attention deficit hyperactivity disorder. Students reporting low vision (47%) were significantly more likely to have Multiple Disabilities than those who reported being blind (12%),  $\chi^2(1, 66)=6.64$ ,  $p<.01$ .

Table 1 shows differences between scores of students with a Visual Impairment Only and those with Multiple Disabilities. Because of the number of comparisons, a Bonferroni adjustment to the alpha level was applied. Test results on the two key variables: Grades and Intention to Graduate are not significant after the Bonferroni correction although the effect sizes for both are moderate (i.e.  $>.5$ ). Students with a Visual Impairment Only had higher Grades and stronger Intention to Graduate than those with Multiple Disabilities/Impairments. They also had more favorable Attitudes toward graduation and Course Self-efficacy scores although only the latter remained significant after the Bonferroni correction; again, both variables have moderate effect sizes. While the two groups were similar on age, parents of students with Multiple Disabilities had higher education. The two groups worked similar hours during the academic term and

**Table 1.** Comparison of scores of visual impairment only and multiple disabilities/impairments groups.

	Group	Mean/ median	Standard deviation	t-test or Mann– Whitney U	df	p value	Cohen's d
<i>Key variables of interest</i>							
Grade <sup>a,b</sup>	Visual Impairment Only	1.50	n/a	300.00	n = 40	.005**	.76
	Multiple Disabilities	2.00	n/a		n = 24		
Intention to Graduate	Visual Impairment Only	5.83	.25	2.38	64	.021*	.54
	Multiple Disabilities	5.62	.49				
<i>Demographics</i>							
Age	Visual Impairment Only	31.93	10.50	.25	64	.800	.06
	Multiple Disabilities	31.20	12.44				
Parental education: father	Visual Impairment Only	12.32	3.64	−1.81	61	.075+	.47
	Multiple Disabilities	13.96	3.33				
Parental education: mother	Visual Impairment Only	11.83	3.06	−3.15	61	.003**	.78
	Multiple Disabilities	14.67	4.05				
<i>School-related aspects</i>							
Employment hours per week <sup>c</sup>	Visual Impairment Only	6.91	12.23	−.26	64	.798	.07
	Multiple Disabilities	7.72	12.61				
Campus Climate Social Alienation <sup>a</sup>	Visual Impairment Only	2.20	1.10	−1.27	64	.210	.31
	Multiple Disabilities	2.59	1.40				
<i>College Experience Questionnaire (CEQ)</i>							
CEQ: personal situation	Visual Impairment Only	3.81	1.04	.95	64	.347	.24
	Multiple Disabilities	3.58	.83				
CEQ: school environment	Visual Impairment Only	3.80	.79	.17	64	.867	.04
	Multiple Disabilities	3.76	1.17				
<i>Self-efficacy (academic)</i>							
Course self-efficacy	Visual Impairment Only	7.33	1.25	3.77	64	<.001***	.92
	Multiple Disabilities	5.92	1.78				
Social self-efficacy	Visual Impairment Only	7.50	1.75	1.80	64	.076+	.45
	Multiple Disabilities	6.67	1.91				
<i>Theory of Planned Behavior</i>							
Attitude related to graduation	Visual Impairment Only	2.39	.63	2.36	64	.021*	.56
	Multiple Disabilities	1.95	.91				
Perceived behavioral control related to graduation	Visual Impairment Only	4.59	.92	.16	64	.875	.05
	Multiple Disabilities	4.55	.81				

(Continued)

**Table 1.** (Continued)

	Group	Mean/ median	Standard deviation	t-test or Mann– Whitney U	df	p value	Cohen's d
Subjective norms related to graduation	Visual Impairment Only	5.15	1.04	.49	64	.626	.12
	Multiple Disabilities	5.02	1.16				

After a Bonferroni adjustment of the alpha level only, comparisons with  $p < .004$  or better remain significant. Boxed items denote “moderate” effect sizes (i.e.  $>.50$ ).

<sup>a</sup>Lower score is better, else higher score is better.

<sup>b</sup>Mann–Whitney U test.

<sup>c</sup>All students including 0 hrs for students who did not work. Comparison of scores of only those who did work was not significant.

\* $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

similar proportions of students with Visual Impairment Only (61%) and Multiple Disabilities (64%), did not work during the academic year.

While there was no significant difference on qualifications pursued, gender, or field of study, students with Multiple Disabilities were more likely to be enrolled part-time than students with a Visual Impairment Only,  $\chi^2(1, 64) = 3.86, p < .05$ .

### *All students: intention to graduate and grades*

**Intention to graduate.** To predict intention to graduate, we entered the Campus Climate Social Alienation and the two Self-efficacy scales, the Grade and the Visual Impairment Only versus Multiple Disabilities variables, as well as the three Theory of Planned Behavior scores into a stepwise regression equation. Only two variables entered the regression: stronger Perceived Behavioral Control over graduation and the binary Visual Impairment Only versus Multiple Disabilities variable, with each adding significantly to the prediction,  $F(2, 58) = 7.34, p < .001$ . Together, these accounted for 23% of the variance.

Due to shared variance, several variables of interest correlated with Intention to Graduate did not add significantly to the model. Table 2 shows that stronger Course Self-Efficacy and more favorable Attitude toward graduation were also significantly related to Intention to Graduate. Both predictors were significantly correlated with several variables (Table 2).

**Grade.** To predict Grade, we entered the following variables into a stepwise discriminant analysis: the two CEQ and Self-efficacy measures, Gender, Employment Hours, Campus Climate Social Alienation, and the binary Visual Impairment Only versus Multiple Disabilities variable. Results indicate that only Course Self-efficacy entered the equation. This variable was significant,  $F(1, 61) = 8.69, p < .005$ , and accounted for 12% of the variance in Grade. However, Number of Disabilities was also correlated with Grade. Table 2 shows that several variables unrelated to Grade were correlated with the only predictor, Course Self-Efficacy.

**Relationships among variables.** The correlation matrix in Table 2 shows that most of the variables in this investigation are related to the predictors or correlates of Grades or Intention to Graduate. A notable exception is parental age.

**Table 2. Students: Correlations among variables.**

	Grade <sup>a,b</sup> to Intention to Graduate	Number of disabilities 0–5 <sup>a</sup>	Age	Years of education of father	Years of education of mother	Employment hours per week	Campus climate: social alienation <sup>a</sup>	CEQ: personal situation	CEQ: school environment	Course self-efficacy	Social self-efficacy	Attitude	Perceived behavioral control	Subjective norms
<i>Key variables of interest</i>														
Grade <sup>a,b</sup>	1													
Intention to Graduate	-.165	<b>.302*</b>	-.032	.005	.113	-.014	-.019	-.168	.079	<b>-.412**</b>	-.224	-.094	-.066	-.071
Demographics														
Number of disabilities (1–5 disabilities) <sup>a</sup>	-.165	<b>-.246*</b>	.018	-.159	-.206	.005	-.209	.129	-.013	<b>.248*</b>	.158	<b>.282*</b>	<b>.386**</b>	.081
Age	<b>.302*</b>	1	.104	.123	.244	-.072	.222	-.188	-.028	<b>-.356**</b>	-.167	<b>-.261*</b>	-.069	.005
Parental education: father	-.032	.104	1	<b>-.390**</b>	<b>-.539**</b>	.192	.163	<b>-.400**</b>	-.136	.027	.053	.162	<b>-.314*</b>	-.233
Parental education: mother	.005	.123	<b>-.390**</b>	1	<b>.838**</b>	.024	-.136	.243	.182	.061	.087	-.036	.180	.239
<i>School-related aspects</i>														
Employment hours per week	.113	.244	<b>-.539**</b>	<b>.838**</b>	1	.094	-.021	.188	.052	-.154	-.094	-.154	.134	.244
Campus climate: social alienation <sup>a</sup>	-.014	-.072	.192	.024	.094	1	-.136	-.077	-.137	-.035	.073	-.080	-.270*	-.020
<i>College Experience Questionnaire (CEQ)</i>	-.019	.222	.163	-.136	-.021	-.136	1	<b>-.497**</b>	<b>-.443**</b>	<b>-.474**</b>	<b>-.748**</b>	<b>-.401**</b>	<b>-.295*</b>	<b>-.278*</b>
CEQ: personal situation	.079	-.188	<b>-.400**</b>	.243	.188	-.077	<b>-.497**</b>	1	<b>.530**</b>	<b>.476**</b>	<b>.327**</b>	<b>.310*</b>	<b>.381**</b>	.142
CEQ: school environment	.079	-.013	-.136	.182	.052	-.137	<b>-.443**</b>	<b>.530**</b>	1	<b>.260**</b>	<b>.270*</b>	<b>.275*</b>	<b>.260*</b>	.043
<i>Self-efficacy (academic)</i>														
Course self-efficacy	<b>-.412**</b>	<b>.248*</b>	.027	.061	-.154	-.035	<b>-.474**</b>	<b>.476**</b>	<b>.260*</b>	1	<b>.524**</b>	<b>.452**</b>	<b>.255*</b>	.231
Social self-efficacy	-.224	.158	.053	.087	-.094	.073	<b>-.748**</b>	<b>.327**</b>	<b>.270*</b>	<b>.524**</b>	1	<b>.394**</b>	.215	<b>.294*</b>
<i>Theory of Planned Behavior</i>														
Attitude toward graduation	-.094	<b>.282*</b>	.162	-.036	-.154	-.080	<b>-.401**</b>	<b>.310*</b>	<b>.275*</b>	<b>.452**</b>	<b>.394**</b>	1	<b>.392**</b>	-.009
Perceived behavioral control related to graduation	-.066	<b>.386**</b>	-.069	<b>-.314*</b>	.180	<b>-.270*</b>	<b>-.295*</b>	<b>.381**</b>	<b>.260*</b>	<b>.255*</b>	.215	<b>.392**</b>	1	<b>.251*</b>
Subjective norms related to graduation	-.071	.081	-.233	.239	.244	-.020	<b>-.278*</b>	.142	.043	.231	<b>.294*</b>	-.009	<b>.251*</b>	1

Significant coefficients are bolded.

<sup>a</sup>Lower scores are better.

<sup>b</sup>Spearman nonparametric correlation coefficients, else Pearson product-moment parametric coefficients.

\**p* < .05; \*\**p* < .01 or better.

## Discussion

*Do students reporting having low vision and those reporting being blind differ on aspects related to postsecondary academic success?*

No.

*Do male and female students differ on variables related to academic success?*

No.

*Do students reporting having a visual impairment only and those reporting multiple disabilities differ?*

Yes. Students reporting disabilities other than a visual impairment fare more poorly. They are less likely to intend to graduate and have worse scores on several variables shown in this investigation to be related to academic performance and persistence.

*What are the best predictors of graduation and grades?*

**Graduation.** The two best predictors, stronger perceived behavioral control over graduation and reporting having only a visual impairment, with no other disability, accounted for 23% of the variance in intention to graduate. Perceived behavioral control is related to both self-efficacy beliefs (i.e. ability to perform certain behaviors) and perceived controllability (i.e. “an attempt to deal with situations in which people may lack complete volitional control over the behavior of interest” [Ajzen, 2002, p. 666]).

Other variables related to intention to graduate and its best predictor (perceived behavioral control), include more favorable views about the impact of graduation, stronger course self-efficacy (e.g. confidence in being able to research a term paper), more facilitating school (e.g. faculty attitudes) and personal situations (e.g. family situation), younger age, being less alienated on campus, more favorable beliefs about graduation of others important to the student, and fewer hours spent working.

The literature on nondisabled students generally indicates that working during the academic year interferes with graduation (Bozick, 2007). We did not find such a direct relationship although working fewer hours was related to the best predictor of intention to graduate. Thus, we tentatively concur with the researchers who advocate that students obtain some work experience prior to graduation as a means of facilitating employment upon graduation (McDonnall, 2011), but hope that this occurs during summer breaks.

It is noteworthy that gender was unrelated to intention to graduate or its predictors: this is inconsistent with findings for students with disabilities in general (Wessel, Jones, Markle, & Westfall, 2009) and needs replication.

**Grades.** Only course self-efficacy predicted grades, and this accounted for only 12% of the variance. Several variables unrelated to grades per se were, however, related to course self-efficacy: stronger intention to graduate, fewer disabilities, more facilitating personal and school-related circumstances, lower social alienation on campus, higher social self-efficacy, more favorable attitude toward graduation, and greater perceived behavioral control over to graduation.

Thus, the relationship between course self-efficacy and grades is not simply circular (better students, i.e. those with stronger self-efficacy beliefs, get higher grades; those with higher grades have stronger self-efficacy beliefs) because many variables related to course self-efficacy were not



directly related to grades. These correlates of course self-efficacy are important to consider in efforts to improve academic performance.

## Limitations and future directions

Sample sizes, self-selection biases, volunteer effects, the recruitment strategy, self-reporting of disabilities/impairments, and the few individuals not registered for campus disability-related services pose methodological challenges. Moreover, given the number of participants who reported having disabilities/impairments in addition to a visual impairment, the impact of multiple disabilities/impairments on academic success of students with visual impairments also needs to be investigated along with evaluations of the severity of low vision. While our results are being disseminated widely in a variety of formats, further research is needed on larger samples, preferably in the context of obligatory fully accessible campus-wide surveys. Nevertheless, our findings resulted in a variety of implications for postsecondary practice.

## Implications for practice and recommendations

Why is it that large numbers of students with low vision reported having multiple disabilities, while this was not true of students who are blind? Are students who are blind and have another disability simply not encouraged to enter postsecondary education, or is there some other factor mediating this relationship, such as medical conditions resulting in both low vision and another impairment/disability? If the former, then high school students who are blind and have other disabilities need to be encouraged to enter postsecondary education. If the latter, then schools and organizations providing services, assistive technologies, and academic services for individuals with low vision need to inquire about – and accommodate – the other disabling conditions. A related issue concerns the higher incidence of part-time status for students with multiple disabilities/impairments. Whether this is due to students' disabilities/impairments, the school's policies, or financial aid issues is a topic worthy of investigation in its own right.

The findings suggest that course self-efficacy beliefs, an important correlate of both better grades and stronger intention to graduate, could be enhanced in a variety of ways. First, it is essential to provide a campus atmosphere that is welcoming (decreasing social alienation) and to ensure that students with visual impairments have adequate opportunities to dialogue with faculty and fellow students (increasing social self-efficacy). Training in high school and transitional programs that develop aptitudes related to note taking, time management, participation in class discussions, asking questions in class and talking to faculty and academic staff would provide students with the skills needed to succeed in college (increasing course and social self-efficacy). Similarly, postsecondary student services professionals need to ensure that workshops which teach study, research, and time management, skills are inclusive and accessible to students with visual impairments.

The findings also suggest that some personal circumstances can be improved, such as helping students with financial aid, providing an environment that helps students socialize, assisting students with study skills, and making provisions for health-related accommodations. School environment-related findings suggest that colleges and universities could help students with course schedules and course load, ensure that attitudes of professors and other members of the postsecondary community are favorable, and that computers with needed adaptations are available on campus, and assure the timely availability of course materials in alternative formats.

Last but not least, colleges and universities need to take into account the older age of students with visual impairments, who may no longer be living with parents and may already have a family. These students should not be forced to choose between eligibility for funding to go to school and other disability support programs for life's necessities.

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