
Executive Summary - Predicting the At Risk Status of College Students: Males and Students With Disabilities



Final Report Presented to PAREA

Spring 2009



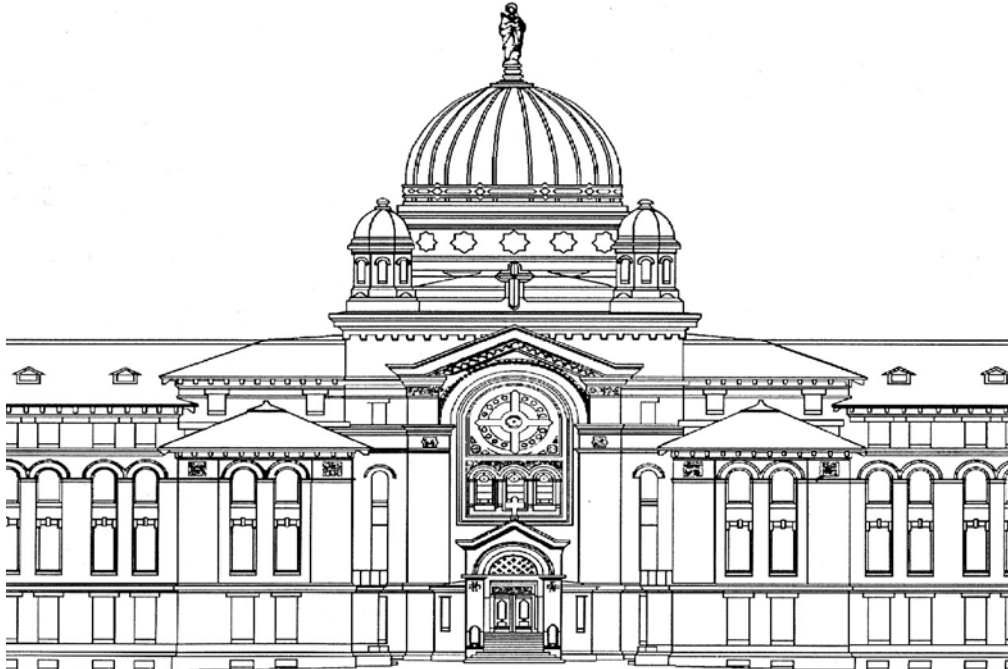
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This research was funded by the Ministère de l'Éducation's Programme d'aide à la recherche sur l'enseignement et l'apprentissage (PAREA) and by the Canadian Council on Learning (CCL). The content of this report reflects the views of the authors and not the funding agencies.

This report examines the postsecondary attrition and academic performance of males (compared to females) and students with disabilities, two groups on which limited research is currently available. The research addresses four main issues: 1) differences in attrition patterns among the targeted sub-populations, 2) a comparison of the background, demographic, psychosocial and study skill variables that lead to attrition and poor first semester performance, 3) the predictive value of these variables for the targeted sub-populations in identifying students who are at risk at the time they enter college and 4) reasons given by students for leaving postsecondary study prior to completing their diplomas. The analysis included those students who commenced studies for the first time at a large non-residential English college in Quebec between 1990 and 2007. The college offers three-year career programs (26% of enrolments) and two-year programs leading to university entrance (68% of enrolments). Six percent of students are also enrolled in qualifying studies. In addition to the high school average, we compared three groups of variables 1) six background variables obtained from the students' records (Records variables), 2) nine variables obtained from the college's annual incoming student survey (ISS variables) and 3) ten psychosocial and study skill variables obtained from the Student Readiness Inventory (SRI variables) (ACT Testing Services, 2008). The following provides a summary of the findings related to each of our research questions.

Are the attrition patterns of students with and without disabilities similar?

Although we anticipated that the attrition patterns for students with and without disabilities would be similar, this proved not to be the case. For both the three-year career programs and two-year pre-university programs, attrition rates were lower for students with disabilities in the early semesters. For pre-university programs the average rate of dropout between semester 1 and 3 over the period studied was 15.5% for students with disabilities vs. 25.7% for students without disabilities. However, the attrition rate for students with disabilities was higher between semesters 4 and 10 (23.3% for students with disabilities vs. 14.9% for students without disabilities). This pattern was also true in three year career programs. However, the graduation rates, as measured at the commencement of the 10th semester, were similar for both groups. The percentage of students who were still enrolled in the 10th semester, with the potential to graduate at some future time, was somewhat higher for students with disabilities. The pattern of lower dropout in the early semesters, and higher dropout in later semesters held for both males and

females with disabilities. Males dropped out at higher rates than females for both students with and without disabilities, with the attrition rate for males approximately 10% - 12% higher by the tenth semester.

Is the attrition rate of males the same as that of females, when corrected for high school average?

Our hypothesis that males with high school averages below 80% drop out at higher rates than females with comparable averages, but that the gap narrows for averages above 80% was supported. Males entered the college with lower high school averages than females.

Consequently, it was possible that the reason males dropped out at higher rates was solely a reflection of the difference in high school entry grades. The attrition rate of male students with high school averages below 80% was 8% - 11% above that of females with high school averages in the same range. At an average above 80% the gap narrowed, and the attrition rate of males was only 2% higher. This held true regardless of disability. In other words, a large part of the problem of high rates of attrition in the male population was related to those males entering with high school averages in the lower range.

Is the high school average the strongest predictor of both attrition and poor academic performance, but a better predictor of academic performance?

Our hypothesis that the high school average would be the best predictor of both dropout and academic performance, but a better predictor of academic performance, was supported. The models showed that, of the variables we tested, the high school average was the best predictor of first semester grades and dropout by both the 3rd and 10th semester. The addition of background, demographic and psychosocial and study skill variables to the high school average did not improve the ability of the models we tested to predict academic performance, except marginally, and to a greater extent for males. The one exception was for females with disabilities, where the high school grade was not the best predictor of 3rd semester attrition, although it was the best predictor of 10th semester attrition. The metrics we used to compare the regression models showed that the high school average was better able to discriminate between students achieving either high or low grades in the first semester, than between students who dropped or did not dropout by either the 3rd or 10th semester. This was determined by comparing the areas under the

ROC curves. Areas were rated 'fair' at best for the attrition ROC curves, but 'good' for the academic performance curves. The precision of the academic performance models was also higher. However, in absence of the high school grade, all three groupings of variables we tested were able to give better than chance prediction for both attrition and first semester performance with few exceptions.

Are the factors associated with male attrition similar to those of females?

Our hypothesis was that the factors that are associated with males dropping out will be similar to those of females, but their relative importance will differ.

Students Without Disabilities

When all 15 background and demographic variables were tested in our 3rd semester attrition models, high school average and age entered the logistic regression for both females and males, and were the strongest predictors of attrition for both groups. Older students commencing studies for the first time were more likely to drop out. In addition, motivation and language were two variables that entered the model for females but not males. Other variables that were significant in the 3rd semester attrition model for males, but not females, were median family income, paid employment, level of studies, English placement level and country of birth.

The level of studies to which the student aspired was significant for males but not females. The difference in the attrition rate for males who said that they hoped to achieve a Bachelor's degree or Diploma was 10.8% higher than those who claimed they aspired to a Masters or PhD. The difference for females (3.2%) was not significant. The only grouping where we found male attrition rates to be lower than those of females was in the group of males who aspired to a PhD.

There was a significantly higher attrition rate for both males and females who worked over 15 hours per week in paid employment (Females: 9% higher; Males: 13% higher), although the variable did not enter the logistic regression for females. Another variable with a large difference in the attrition rate was program choice. The attrition rate was 10.4% higher for females who were not in their first choice program, a variable that was not significant for males.

There does, therefore, seem to be some differences in the factors contributing to male and female attrition, although the strongest predictor for both groups was the high school average. In addition, the predictive value of the variables was higher for males than for females. Generally, male models tended to have higher sensitivity and precision over the cutoff range. The effect sizes (measured by the Nagelkerke R^2 which has a theoretical range between 0 - 1) were also larger for males compared to females, indicating a stronger relationship between the variables we tested and the attrition rate for males. However, the largest effect sizes obtained for the attrition models we tested were .219 for males and .178 for females, indicating that although variables were significant, the strength of the association was not strong.

Students With Disabilities

Due to sample size constraints, we were only able to compare survey variables for students with disabilities using chi square tests. The common variables for males and females with disabilities with significant differences in attrition were high school average and age. Although out-of-class study time was not significant for either males or females, it was significant when both groups were combined. There was a 15.9% differences in attrition rate between those who did and those who did not spend more than 12 hours on out-of-class study, a differential that was higher than for the age (9.9%) and high school average (8.6%) variables.

We were only able to do more limited modeling of students with disabilities using variables obtained from the student's records, due to sample size constraints associated with variables collected from surveys. In the pre-model tests of 10th semester attrition, several variables were significant for males (high school average, age, country of birth and English placement level), but only high school average entered the regression model. For females, only the high school average was significant on the pre-model tests, and this variable entered the model along with language. As was the case for students without disabilities, the precision, sensitivity and areas under the ROC curves of the male models were higher than for female models, and the strength of the association between the variables we tested was higher for males. Overall, however, the ability of the models we tested to discriminate between dropout/retention was lower for students with disabilities compared to their nondisabled peers

Summary

There was sufficient evidence to conclude that although the variables that are related to male and female attrition did overlap, with the strongest variables for both groups being age and high school average, there were some notable differences. Thus our hypothesis was only partially supported. The relative importance of the variables in predicting attrition was higher for males compared to females.

Do factors that predict attrition in pre-university programs also predict attrition in career programs?

We tested eight records variables in this analysis. In the model pre-test all variables were significant with the exception of country of birth for both diploma types, and median income which was not significant for career programs. High school average, age and sex were the variables with the heaviest weights for both groups. The variables entering the logistic regression model were high school average, age, language and sex for both career and pre-university programs. Median family income entered the pre-university model but not the careers model. For the most part, the variables that contributed to dropout in career programs also contributed to dropout in pre-university programs. Median family income however, was more of a factor in pre-university programs. We did not test the survey variables in these models.

Do the factors that are predictive of poor academic performance in the first semester differ from those that predict attrition?

Our hypothesis was that the factors that are predictive of poor academic performance will differ from those that predict attrition. We were only able to include the Records and ISS variables for students without disabilities in this analysis due to sample size constraints related to students with disabilities. Only third semester attrition is compared, as there was no ISS survey data relating to tenth semester attrition.

Students Without Disabilities

We found that the high school average was the strongest predictor of first semester grades, and for males, it was the only variable entering the first semester performance model. However, for the third semester attrition model, high school average entered the model along with age, level of

studies, paid employment, median family income and English placement level. Although high school average was the strongest predictor of both attrition and academic performance, there were more variables that were significant in the male attrition models than in the performance models. For females, high school average entered the performance model as did language and median family income. However, for the third semester attrition model high school average, language, age and motivation entered the model. Consequently, the variables that were significant for the attrition model overlapped to some extent as high school average and language entered both models. However, age and motivation were unique to the attrition model.

Students With Disabilities

Although we were unable to model third semester attrition using the survey variables for students with disabilities due to sample size constraints, we did compare the differences in attrition rates by level of the independent variables using chi square tests, and differences in first semester grades using independent sample t tests. For males, high school average, age and mother's country of birth showed significant differences in third semester attrition by level of the independent variable. Variables showing differences in first semester grades were high school average, age, mother's country of birth as well as level of studies, study time in last year and time anticipated on out-of-class study at college. Three of the six variables related to third semester grades were also related to third semester attrition. For females, high school average, age, median family income and English placement level showed significant differences in 3rd semester attrition by level of the independent variables. Variables showing differences in first semester grades by level of variable were high school average, and English placement level. Two of the four variables related to attrition were also related to first semester grades.

Summary

Our hypothesis was only partially supported. Although there were some variables that were related to both third semester attrition and first semester performance, there were more variables that were significant in the attrition models. Age, which figured prominently in the models of attrition, did not enter the models of academic performance. Unlike the attrition models, the variables we tested were equally able to discriminate between high and low first semester CRC scores for both males and females and students with and without disabilities. There were no

differences in the strength of the relationship between first semester performance and the variables we tested among groups.

Psychosocial and Study Skill Variables (ACT Student Readiness Inventory)

Students with disabilities scored significantly lower than their nondisabled peers on six of the ten SRI psychosocial and study skill scales, as did males. The largest difference between students with and without disabilities was on the Academic Self-Confidence scale followed by the Social Connection Scale. The largest difference between males and females (without disabilities) was on the Academic Discipline scale followed by the Communications Skills scale. There were no differences in scale scores between males and females with disabilities, although the numbers of those responding were low, making it difficult to show significance. Although the ten SRI psychosocial and study skill scale variables were better able than the Records variables to discriminate between high and low first semester grades, neither grouping of variables enhanced the discrimination achieved by the high school average alone. We were unable to test the SRI variables in attrition models because the number of those dropping out by the third semester were too low at the time of writing, and the sampling adequacy criteria was not met.

Reasons For Leaving College – Do They Differ Among Sub-populations?

Our hypotheses 1) that the most important reasons for leaving given by students with disabilities would be similar to those of students without disabilities, and not related to their disabilities, and 2) that the reasons for leaving of males and females with and without disabilities would mirror each other were not supported. A significantly larger proportion of students with disabilities (40%) than without disabilities (1%) indicated that they left Dawson due to disability/personal health issues. This was also the most frequent reason reported by females with disabilities. The most important reasons for leaving given by females without disabilities were to attend university, and career direction uncertainty/change. For males without disabilities the most frequent reasons were career direction uncertainty/change and because they did not like the program they were in.

Our hypothesis that students who leave in the first and second semester of their programs will report different reasons for leaving their college studies compared than those who leave in the third or later semesters was supported. Students leaving in their first year were more likely to say they left due to career direction uncertainty/change, or they did not like the program they were in. The most frequent response category for students who left later in their studies was low motivation and other factors inside the college. There was also some support for our hypothesis that the reasons for leaving for males and females would be similar, as three of the top five reasons for leaving were the same for both groups. However, attendance at university and disability/personal health issues did not rank in the top five for males. Attended a different college and the shooting incident did not rank in the top five for females.

Predicting Attrition and Academic Performance

Many of the variables we used in this study have been reported in the literature to be related to student departure, and many of them were statistically significant in the models we tested. However, when added to the model with the high school grade, they did little to enhance the ability of the model to discriminate between dropout/retention, or low/high first semester academic performance over what could be achieved by the high school grade alone.

By examining the ROC curves we could improve the precision of the models we tested. But the precision of 3rd semester models was low. To a certain extent this was related to the fact that so few students dropped out by the third semester relative to the number who were retained, that the effect of the false positives was high. For a model to be precise when there is a large imbalance in occurrences of the binary classifier, the specificity would have to be very high. Precision and effect sizes improved when we modeled attrition to the 10th semester, and using the coefficients from the 10th semester models to predict attrition on a new sample may be a better option. By the tenth semester the impact of the variables on the students' departure decisions will have had time to manifest. However, this has disadvantages as changes that occur that could influence the model coefficients would not be detected until much later.

Profiles of Males and Females With Disabilities – Recommendations

As a result of this study and our previous work we are beginning to build profiles of males and females with and without disabilities. Based on our findings, recommendations targeted to the needs of these sub-populations are provided.

Acknowledgements

We would like to express our appreciation for the generous support of la Programme d'aide à la recherche sur l'enseignement et l'apprentissage (PAREA, Quebec), the Canadian Council on Learning (CCL) and Dawson College.

We would also like to thank Jie Du and Vittoria Ferraro for their tireless efforts in compiling and organizing the data.