At-Risk Students, Who are They and Why Do We Care?

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Presentation Overview

• Introduction
• Who are at-risk students?
• Methodology: Cluster Analysis
• Results
• Conclusion and next steps
At-Risk Students, Who are They and Why Do We Care?

About the University of Guelph

- Founding colleges established 150 years ago
  - Ontario Agricultural College, Ontario Veterinary College, Macdonald Institute
  - Now comprises of 7 colleges
- Doctoral, research-intensive university
  - # undergraduate students = 26,572
  - # graduate students = 2,695
  - # faculty = 759

Source: 16/17 Data, Institutional Analysis and Research
Retention Initiatives

• **STARTonTrack** is a program for new undergraduate students that provides resources and support from upper year students for success at University of Guelph

• **STARTOnline** is an online support service which provides information, answers questions and connects new students with others in the Guelph community

• **Bounce Back** is a one-on-one mentoring program in the Winter semester of each year for first-year students
Introduction

• Why do we care about retention?
  • Students who graduate from university earn more (National Center for Educational Statistics, 1989; Parkin & Baldwin, 2009)
  • Increases the institutions income (National Center for Educational Statistics, 1989)
  • Diversity facilitates deeper learning and growth (Bollinger, 2003; Maruyama & Moreno, 2000)
  • The upfront cost for recruitment

• Unfortunately, 20-25% of students drop out after first year and only 60% of students end up graduating (Grayson & Grayson, 2003)
Introduction cont.

• There are common variables associated with attrition/retention

• Creating the “at-risk” student profile to provide support

• Profiles should be institution specific
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Who are At-Risk Students?
Defining At-Risk Students

• Two ways literature has defined at-risk:
  1. Students who leave before completing their program (Grebennikov & Skaines, 2008)
  2. Those who underperform academically (Grebennikov & Skaines, 2008)

• At-risk variables:
  • GPA
  • First-generation students
  • Minorities and marginalized groups
  • Financial Support
  • On/off campus
  • Gender and age
  • Distance from home
Admission Grade Point Average (GPA)

• First year students with a higher entering GPA have been shown to have higher retention to second year (Bilodeau & Meissner, 2016; Demetriou & Schmitz-Sciborski, 2011; McKenzie & Schweitzer, 2001; Murtaugh et al., 1999)

• Lower graduation rates among students who had lower entering high school GPAs (Shaienks, Gluszynski & Bayard, 2008)
First Semester/Year GPA

• Using first semester/year GPA as an independent and dependent variable

• Independent: Using GPA to predict success
  • Students’ first semester and/or year GPA can be used to predict student retention (Deberand et al., 2004) and graduation (Menard et al., 2012)
  • Greater retention among those with a higher first year GPA, versus those with a lower first year GPA (Deberard et al., 2004; McGarth & Braunstein, 1997)

• Dependent: Using GPA as a measure of success
  • Measuring a GPA pre and post intervention (Bilodeau & Meissner, 2016)
First-Generation Students

• First-generation: Students’ whose parents have not attended any post-secondary education

• First-generation students have been shown to dropout at higher rates than students who had at least one parent graduate from college or university (Cataldi et al., 2018; Martinez et al., 2009)

• Shown to be more academically unprepared, lack of financial support and more part-time studies (Cataldi et al., 2018)
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Minorities & Marginalized Groups

• Higher attrition rates among students in on-campus minority groups, including religion, race, or sexual orientation (Galicki & McEwan, 1989; Peltier et al., 2000)

• Often time minority groups are also first-generation

• Important to keep a diverse campus (Maruyama & Moreno, 2000)
Support (Financial, Social, Emotional)

• Receiving financial aid allows students to focus more on their studies (Parking & Baldwin, 2009)

• Students that engage in meaningful ways with faculty, students, and staff have been shown to stay at university longer (Bilodeau & Meissner, 2016; Davidson et al., 2009; Grayson, 2003; Johnson, 2000)

• Students that feel emotional support from friends and family to finish their degree, along with support of university services (e.g., counselling) also show higher persistence and retention (Bilodeau & Meissner, 2016; Johnson, 2000; Parkin & Baldwin, 2009)
Living in Residence

• Students who live in residence in their first year have been shown to have greater success and retention than commuters (Academia group, 2016a; Academia group, 2016b)

• At U of G, first year residence students have higher GPA, higher retention and more positive graduation outcome (Academia group, 2016a)
Gender & Age

• On average, females and younger students graduate at higher rates than males and older students (Galicki & McEwan, 1989; Menard et al., 2012)

• Factors contributing to the attrition of mature students (Bergman et al., 2014; Lambart et al., 2004):
  • Working during university
  • Having dependents
  • Living off-campus
  • Lack of social support
Other Predicting Factors

• Mental health and substance abuse contribute to persistence or attrition of students (Deberard et al., 2004; Martinez et al., 2009; Turner & Berry, 2000; Turner, 2012)

• Building a comprehensive profile of a student needs to take into account all the biopsychosocial factors
Methodology

• How our study measures at-risk:
  1. Retention of students from first to second year
  2. Student graduation rates after five years
Cluster Analysis (1/3)

- Cluster analysis allows us to divide students into different groups using just the data.
  - Students are assigned a cluster based on a host of attributes.
- It is similar to a risk score, but its main advantage is that it puts students into discrete clusters which can be interpreted.
- This is of particular use if there are many students with different attributes.
Cluster Analysis (2/3)

• The first step of the analysis is to determine the appropriate number of clusters to divide our data into, using all the data mentioned above, but excluding the at-risk measures.
  • We used the “Elbow Method”, which plots the amount of variance explained by the number of clusters.
  • The more clusters used, the more variance is explained, however, the marginal improvement decreases at some point.
Cluster Analysis (3/3)

• Once we selected the optimal number of clusters, we performed Partitioning Around Medoids (PAM) cluster analysis, which assigned each of the students in our data a cluster based on the variables mentioned above.

• We were then able to identify which clusters contained at-risk students, and which clusters did not based on our study’s at risk measures.
Graphical Representation: Retention
Graduation
Results: Who are At-Risk Students?
Retention to Second Year

**Less Likely to be Retained**
- Postal Code at Time of Application More Likely between 35 and 75 km (Ontario & Quebec)
- Less Likely to Live in Residence
- More Likely to be Male
- More Likely to be Part-Time in First Semester
- Receive Less Need-Based Awards
- Receive Less Merit-Based Awards
- Less OSAP Issued
- Lower First-Semester GPA
- First Semester Program: Bachelor of Arts, General
- Less likely to be registered in Co-op Stream in First Semester
- STARTOnline: Less Likely to Participate
- STARTonTrack: Less Likely to Participate

**More Likely to be Retained**
- Postal Code at Time of Application More Likely to be more than 150 km (Ontario & Quebec)
- More Likely to Live in Residence
- More Likely to be Female
- More Likely to be Full-Time in First Semester
- Receive More Need-Based Awards
- Receive More Merit-Based Awards
- More OSAP Issued
- Higher First-Semester GPA
- First Semester Program: Bachelor of Science, Honours
- More likely to be registered in Co-op Stream in First Semester
- STARTOnline: More Likely to Participate
- STARTonTrack: More Likely to Participate
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Graduation

Less Likely to Graduate
- More Likely to be between 35 and 75 km
- Less Likely to Live in Residence
- More Likely to be Male
- More Likely to be Part-Time in First Semester
- Average of 4 Full-Time Semesters until Part-Time
- Receive Less Need-Based Awards
- Receive Less Merit-Based Awards
- Less OSAP Issued
- Lower First-Semester GPA
- First Semester Program: Bachelor of Arts, General
- Less likely to be registered in Co-op Stream in First Semester
- More Likely to Withdraw or Deregistered
- More Likely to be Required to Withdraw
- STARTOnline: Less Likely to Participate
- STARTonTrack: Less Likely to Participate

More Likely to Graduate
- More Likely to be more than 150 km
- More Likely to Live in Residence
- More Likely to be Female
- More Likely to be Full-Time in First Semester
- Average of 8 Full-Time Semesters until Part-Time
- Receive More Need-Based Awards
- Receive More Merit-Based Awards
- More OSAP Issued
- Higher First-Semester GPA
- First Semester Program: Bachelor of Science, Honours
- More likely to be registered in Co-op Stream in First Semester
- Less Likely to Withdraw or Deregistered
- Less Likely to be Required to Withdraw
- STARTOnline: More Likely to Participate
- STARTonTrack: More Likely to Participate
Variables in the 80th percentile that are unique to and shared between the two highest clusters for Retention to Second Year and Graduation Rate:

- Bursary Scholarship
- First Semester GPA
- Participation in STARTOnline
- Live Beyond 150 km
- OSAP Issued
Results: Other Interesting Findings

- While not an important predictor of academic outcomes, average entering age is a defining factor in other clusters
- For both Retention to Second Year and Graduation, found clusters where mature students (average age 22.6) were also:
  - Less likely to have registered directly from high school
  - More likely to be part-time in first semester
  - Less likely to live in residence in first year
  - More likely to receive needs-based institutional financial support
Conclusions and Next Steps

• Benefits of an at-risk profile at U of G:
  • Informs development of targeted access and retention initiatives
  • In collaboration with Student Affairs and Institutional Analysis and Research, this profile is guiding the implementation of a multi-year program evaluation for retention support programming
  • This profile is currently being used to inform a three-year funding provincial grant at U of G, the Ontario Postsecondary Access and Inclusion Program (OPAIP)

• Moving forward, U of G will engage in data collection efforts across all campuses and incorporate additional data points and variables in future analysis as they become available
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Thanks for listening

Questions?
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References


