Examining University Student Transfer Intentions using Logistic Regression

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Abstract

The purpose of this research was to determine the predictors of first-year students’ transfer intentions as a means to more effectively address student attrition. Based upon the literature and a qualitative exploratory study \((n = 29)\), 17 factors associated with student attrition were identified. Data collected from the ensuing quantitative main study \((n = 334)\) across three universities was analysed using multinomial and binary logistic regression. The results revealed that a) students’ plans at commencement to complete their study at their current university; and b) students’ inertia once enrolled at a university significantly differentiated between those students who intended to stay, those who intended to leave and those that were undecided at the end of their first year at university.

Keywords: marketing education, higher education, student retention
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Introduction

The reasons behind student attrition are diverse and complex. As an indicator of performance that is linked to the funding of Australian universities, there is a strong impetus to understand student attrition so as to avert the loss of students which predominantly takes place at the end of their first year of study. Furthermore, in the competitive domestic climate the need to keep students is even more pronounced. The novelty of this research which sets it apart from other studies is that it seeks to identify factors that significantly differentiate between three groups – students who intend to stay, to leave and those who are undecided – so as to generate a more lucid and meaningful picture of university students’ retention decisions.

Background

Despite extensive study from sociological, educational, psychological and psychoanalytical slants, first year student retention remains a complex and perennial concern with up to 30% of students considering withdrawal during this time (Blunden, 2002; Davidson et al., 2008; Gabb, Milne and Cao, 2005; Lawrence, 1971; Mills et al., 2009; Nora, Barlow and Crisp, 2005; Tinto, 1975; 2009). There are many factors that are associated with student attrition. In terms of age (1), students over 25 years on the whole have been found to have clearer goals, be more motivated to study with higher levels of enjoyment from intellectual challenges, more engaged in learning and more satisfied with their courses (Krause et al., 2005; Tumen, Shulruf and Hattie, 2008). In the light of these many facets, it would appear that older students are more likely to stay at university. Lower university entry scores (2) are prevalent among students who leave university as found in a United Kingdom study by Simpson (2003) and an Australian study by McMillan (2005). University preference (3) is intuitively associated with students’ decisions to stay at their current university; however empirical evidence is not forthcoming. What is known is that most students are accepted by their ‘first preference’ course and tend to achieve high grades in their first semester and are more likely to continue study after their first year (Krause et al., 2005; Queensland Studies Authorities, 2004). In this vein, it too appears probable that those students enrolled at their first preference university are also more likely to stay for the duration of their degree.

Planned completion at their current university (4), while not explicitly explored in the literature, is worthy of consideration. Upon commencement at university, studies have highlighted the importance of student’s sense of purpose in regards to their interests and employment aspirations (Krause et al., 2005). Students’ today tend to have an increased sense of purpose and clarity about occupation upon commencement compared to students in the past. This is thought to be due to a combination of cultural changes, a greater proportion of mature age students and that universities are more focused upon the career and job outcomes they are preparing students for. A small proportion of students appear to be marking time at university; being mostly full-time enrolled and with lower marks achieved in first semester (Krause et al., 2005). The impact of students’ intentions upon enrolment to complete their degree at their current university, irrespective of their sense of purpose, was of interest in this study. Another area not examined in the literature to date, but seemingly related to attrition is the influence of living arrangements (5) on persistence at university. Drawing from studies about student income, it appears that more students live at home so as to make attending university affordable (Krause et al., 2005; McInnes and Hartley, 2002).
Institutional integration (6) as conceptualised in Tinto’s (1975) seminal work on student attrition, reflects students’ identification with the academic systems’ norms and operation of their current university. Gabb, Milne and Cao (2005) and Davidson, Beck and Milligan (2009) note there is a marked reduction in university and course switching when there is a ‘fit’ between a student’s aspirations and expectations and what the course actually delivers. Students’ expectations of the degree they are undertaking, how difficult the degree is and aspects of university administration emerged as three important themes in the focus groups conducted for this study. Another aspect of Tinto’s (1975) model is social integration (7). Social integration relates to the interactions between students be they in the classroom, on the sporting field as a part of associations or mentoring programs. The relationship between students’ social interaction and their persistence at university is best exemplified by Tinto’s (2009) Learning Communities, which feature the development of supportive peer groups. In focus groups for this study, respondents indicated that how many friends were made at university, how many people they knew when they commenced university and the proportion of their friends that attended their current university were three key aspects.

The grades (8) that students achieve reflect their ability to meet the explicit standards and preferred style of academic behaviour of their university (Tinto, 1975). Grades appear to be correlated with persistence with high achievers less likely to change courses or institutions after commencing (Krause et al., 2005; Mills et al., 2009; Tinto, 1975). Furthermore, an underemphasised factor in studies of student attrition is the geographical distance of the university from their home town (Yorke, 1999). Hometown proximity (9) is partially underpinned by student income, as research indicates that full-time students rely on support from parents and/or other family members (Krause et al., 2005).

Affordability (10) also appears important to student persistence at university (see Bradley et al. 2008 and James et al., 2008). It is known that that there is a greater need for rural students from government schools to accumulate savings to meet their university costs. While parents often make substantial contributions to younger student’s university education, just over half of all full-time enrolled commencing students are in paid work (McInnis and Hartley, 2002). Inertia once enrolled (11) has also not been explicitly explored in the literature. What is known is that frustration and dissatisfaction is common in students who do not receive their first preference course; however this appears to subside over time with the majority of these students deciding to stick with the course and institution they have been admitted to and “make the most of it” (Krause et al., 2005). Finally, there is no longer a linear progression from school, to university and then on to full-time work (Gabb, Milne and Cao, 2005). About 40% of students work as a mechanism to improve their employability after university (Krause et al., 2005). This being the case, the present job (12) that a student may hold is hypothesised to influence their retention decision. Overall, it is hypothesised that all 12 factors, measured with 17 items, differentiate between staying, leaving and undecided transfer intentions of students at the end of their first year.

Method

A qualitative, exploratory study of interviews and focus groups (n = 29) and a series of pilot tests (n = 63) preceded the main study’s self-administered, quantitative questionnaire. The questionnaire was administered at three universities in Australia to full-time, on-campus, Business students at the end of their first year of study. The useable sample of 334 responses represented an 80.3% response rate. In the case of this study, privacy concerns prevented the universities from releasing detailed sample frame information beyond an aggregated total
number. Nonetheless, the sample was found to be comparable with national statistics (Department of Education, Training and Youth Affairs, 2006), in that the respondents are predominantly women (male = 158; female = 176) between the ages of 18 and 23 years who are attending their preferred education provider (that is, their first preference university). In addition, a Kruskal-Wallis, non-parametric test indicated no significant differences for gender, age, or institution preference across the three service providers sampled. A one-way analysis of variance (ANOVA) also revealed no significant differences among any of the indicator variables in the survey at \( p < .001 \). Therefore, the sample was pooled.

A multinomial logistic regression was conducted as there were three groups of transfer intentions being compared, namely ‘staying’, ‘leaving’ and ‘undecided’. A series of binary logistic regressions then followed. Logistic regression allows researchers to predict group membership from any mix of continuous, discrete and dichotomous variables; with the number of cases in each group not required to be equal (Tabachnick and Fiddell, 2007). There were no violations of the assumptions of logistic regression with both the sample size and group sizes exceeding Tabachnick and Fidell’s (2007) recommendations. In this study, data from 334 respondents were available for analysis, comprising of 240 (71.8%) staying consumers, 31 (9.28%) leaving consumers and 63 (18.86%) undecided consumers. The Technical Appendix details the measures, item wording and scales used.

Results

Firstly, a multinomial logistic regression assessed whether the 17 variables were significant predictors in differentiating between the three categories of transfer intention. As required, there were no zero cell frequencies and no more than 20% of cases with expected frequencies less than five (Tabachnick and Fidell 2007, p. 442). A contingency table analysis on the categorical variables revealed the necessity to collapse the categories (Tabachnick and Fidell, 2007). Age was collapsed into two categories – under 24 years and over 24 years and living arrangements formed two categories being living at home and living away from home (which included students renting, boarding or at a residential college). Lastly, OP Score was collapsed into three categories – OP Scores less than 10; OP Scores between 11 and 25; and alternative entry (which included TE scores, special entry and entry ratings from other States).

Analysis proceeded producing a model that significantly outperforms a constant only model, \( \chi^2 = 144.70, p < 0.01 \). The likelihood-ratio tests indicated that planned completion (\( \chi^2 = 54.39, p < 0.01 \)) and inertia (\( \chi^2 = 17.74, p < 0.01 \)) significantly contributed to the prediction of transfer intention. Hence, the remaining 15 independent variables were not significant. There was a moderate relationship between the independent predictors and the grouping (Nagelkerke’s \( R^2 = 0.45 \)) with 76.3% all students classified correctly by the model.

Next a series of three binary logistic regressions were performed. The first binary logistic, staying versus undecided (\( n = 303 \)), found that the independent variables as a set reliably distinguished between staying and undecided transfer intentions (\( \chi^2 = 63.20, p < 0.01 \)). Nagelkerke’s \( R^2 \) statistic = 0.29 indicated a low relationship between the independent variables and grouping variables and the Hosmer and Lemeshow test indicated good model fit (\( \chi^2 = 6.52, p > 0.05 \)). The Wald criterion confirmed that planned completion (\( z = 14.98, p < 0.01 \)) and inertia (\( z = 12.05, p < 0.01 \)) were significant predictors for this binary.

The second binary logistic regression sought to predict group membership for leaving versus undecided transfer intentions (\( n = 94 \)). The full model was statistically significant, \( \chi^2 = 37.32, \)
Reliably distinguishing between the two groups. The Nagelkerke’s R² statistic = 0.46 indicated a moderate relationship between independent variables and the grouping variable. Furthermore, the Hosmer and Lemeshow test indicated good model fit at \( \chi^2 = 11.46, p > 0.05 \). For this binary, the Wald criterion reported that only one of the independent variables could predict group membership, being planned completion \((z = 10.42, p < 0.01)\). Thus, inertia was not significant for the transfer decision of leaving and undecided students.

The final binary logistic regression explored the predictors that differentiated between staying versus leaving transfer intentions \((n = 271)\). The full model was statistically significant \((\chi^2 = 105.11, p < 0.01)\) demonstrating that the independent variables as a set reliably distinguished between staying and leaving transfer intentions. The Nagelkerke’s R² statistic = 0.63 indicated a moderate relationship between independent variables and grouping with a non-significant Hosmer and Lemeshow test \((\chi^2 = 10.70, p > 0.05)\) indicating good model fit. Finally, the Wald criterion reported that two of the independent variables made a significant contribution to the prediction of staying and undecided transfer intentions, these were planned completion \((z = 34.18, p < 0.01)\) and inertia \((z = 8.38, p < 0.01)\).

Conclusions and Implications

It can be concluded from the multinomial logistic regression that a) students’ plans to complete their study at their current university from the outset; and b) students’ inertia once enrolled at a university significantly differentiated between students’ intentions to stay, leave or consider transferring at the end of their first year of study. Indeed, students who upon commencement plan to complete their study at their current university are more likely to stay. This highlights the importance of pre-enrolment marketing as it is most likely that in the lead up to accepting an enrolment offer, students determine their retention decision.

More intriguing though is the role of inertia. The findings indicate that once at the end of their first year, students may be staying at a university out of indolence, lethargy or a general disinterest in pursuing a move. This partially fits with Krause et al.’s (2005) finding that students not in their first preference course try to “make the most of it”; however in this study inertia is not associated with university preference. Thus, students at their first preference university who may not be entirely satisfied with their experience are just as likely to stay out of apathy or indifference. The binary logistic regression supported these with the exception of the leaving versus undecided category. Students who fall into either of these categories are motivated to take action hence the non-significance of inertia is to be expected.

Limitations and Future Research

This research involved a cross-sectional study of full-time, on-campus Business students at the completion of their first year at three universities in Australia using a self-administered quantitative questionnaire. Irrespective of the limitations that these aspects impose, the novelty of the research remains apparent. Future research that seeks to explain the antecedents and broader role of inertia in university retention of students would be particularly valuable. Studies about the role of planned completion at commencement and inertia at overseas and other Australian universities as well as across different Faculty’s over time would also be fruitful.
### Technical Appendix

<table>
<thead>
<tr>
<th>Variable</th>
<th>Item wording</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>What is your gender?</td>
<td>(1) Male, (2) Female</td>
</tr>
<tr>
<td>Age</td>
<td>In which of the following age groups do you belong?</td>
<td>(1) Under 18, (2) 18-23, (3) 24-29, (4) 30 – 35, (5) 26-41, (6) 42-47, (7) 48-53, (8) 54-59, (9) 60 or older</td>
</tr>
<tr>
<td>OP Score</td>
<td>In which of the following groupings was your university entrance OP Score?</td>
<td>(1) 1-5, (2) 6-10, (3) 11-15, (4) 16-20, (5) 21-25, (6) Special Entry, (7) TE/other state equivalent</td>
</tr>
<tr>
<td>First preference</td>
<td>Was your current university your first preference on your application form?</td>
<td>(1) Yes, (2) No</td>
</tr>
<tr>
<td>Planned completion</td>
<td>When you first began your current degree did you plan to complete it at your current university?</td>
<td>(1) Yes, (2) No</td>
</tr>
<tr>
<td>Living arrangements</td>
<td>Where do you live during the semester?</td>
<td>(1) At home, (2) Residential college, (3) Boarding (not at home), (4) Renting (e.g. house, flat).</td>
</tr>
<tr>
<td>Degree expectations</td>
<td>Overall, is your current Business degree what you expected it would be like?</td>
<td>From (1) Worse than I expected to (5) Better than I expected</td>
</tr>
<tr>
<td>Degree difficulty</td>
<td>How difficult have you found the degree so far?</td>
<td>From (1) Very easy to (5) Very hard</td>
</tr>
<tr>
<td>Administration difficulty</td>
<td>Did you encounter administration difficulties (e.g. enrolment errors, book supply problems) in the first four weeks of your current degree?</td>
<td>From (1) No, none at all to (5) Yes, a lot</td>
</tr>
<tr>
<td>Made friends</td>
<td>Have you made many friends at your current university since you began your current degree?</td>
<td>From (1) No, none at all to (5) Yes, a lot</td>
</tr>
<tr>
<td>Know people</td>
<td>When you first began your current degree, did you know many people (e.g. acquaintances, friends, family) who were in the same degree as you?</td>
<td>From (1) No, none at all to (5) Yes, a lot</td>
</tr>
<tr>
<td>Friends at university</td>
<td>Do you have many friends who presently go to your current university?</td>
<td>From (1) No, none at all to (5) Yes, all of them</td>
</tr>
<tr>
<td>Grades achieved</td>
<td>The grades that you are getting here [this university].</td>
<td>From (1) not important at all to (5) Very important</td>
</tr>
<tr>
<td>Hometown proximity</td>
<td>The university is closer to your hometown than other universities.</td>
<td>From (1) not important at all to (5) Very important</td>
</tr>
<tr>
<td>Affordability</td>
<td>It is cheaper for you to go to this university.</td>
<td>From (1) not important at all to (5) Very important</td>
</tr>
<tr>
<td>Inertia</td>
<td>There is no point to leave this university now that you are here.</td>
<td>From (1) not important at all to (5) Very important</td>
</tr>
<tr>
<td>Present job</td>
<td>You have a good job here [in this city/town].</td>
<td>From (1) not important at all to (5) Very important, (6) not applicable</td>
</tr>
</tbody>
</table>
References


