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Contents

Attrition Patterns in a Diversified Student Body: A Case Study

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Abstract

The composition of the student population in Australian universities has changed significantly over the last two decades. Not only have overseas students become a significant proportion of the student body, but there are also increasing numbers of students from non-traditional backgrounds such as mature-aged students and students entering from the TAFE sector. This paper aims to understand student attrition patterns in Australian universities with diversified student bodies. Using data collected from business students enrolled at University of South Australia, Adelaide in Australia in 2005, this study explores the impact of several factors on attrition including gender, birth country, funding source, academic load, language spoken at home, citizenship, credit transfer and time of admission. Findings from this study suggest that, while attrition of a diverse student body exhibits some similar patterns as described in the literature, there are some largely overlooked factors, such as language spoken at home and credit transfer that may have a significant impact on attrition.

Introduction

The issue of student attrition has attracted increasing attention among administrators and researchers at Australian higher education institutions. Not only does student attrition generate considerable expense for an institution in terms of the cost of recruitment, the provision of tuition staff and physical resources, as well as lost income, the Department of Education, Science and Training (DEST, 2006) uses retention rate, the other side of attrition rate, as one of the seven performance indicators to determine the allocation of teaching and learning funding among tertiary institutions. As a result, universities with higher attrition rates may be seriously and negatively affected in three ways: they lose potential student tuition fees, gain a relatively smaller proportion of teaching and learning funds, and receive a poor ranking compared to other universities, which can damage the institution's reputation.

Accompanied with the dynamics of attrition is a steady increase in non-traditional students, defined as students other than fulltime domestic students matriculating directly from secondary school. Not only have overseas students become a significant proportion of the student body, but there are also increasing numbers of students from non-traditional backgrounds such as mature-aged students and students entering from TAFE. Statistics indicate that school leavers commencing in undergraduate courses have much lower attrition rates than the rest of undergraduate freshmen (DEST, 2004). Institutions with higher proportion of non-traditional students may therefore be disadvantaged.

This study aims to explore attrition patterns in a diversity student body in higher education through an empirical case study of the Business Division at University of South Australia (UniSA). UniSA has the largest student body among the three universities in the State of South Australia. In terms of the composition of the student body, it offers a large, diverse and culturally complex mix of individuals. Not only are students recruited from widely different bases, but there is also a large body of international, trans-national and part-time students. Among 33,620 students enrolled in 2005, nearly one third were fee-paying overseas students (UniSAInfo, 2007a), and over 40 per cent were part-time students (UniSAInfo, 2007b).

The current study is based on the data of students enrolled in the Business Division at UniSA. There are four divisions at UniSA, namely Business; Education, Arts and Social Science; Health Science; and Information Technology, Engineering and Environment. Of these, the greatest diversity in terms of sources of students is in the Business Division. In 2005, more than half of the enrolled students in this division attended part-time, and nearly half of the enrolled students were international students. In addition, more than 60 per cent offshore students and nearly half of fee-paying students at UniSA were enrolled in this Division (UniSAInfo, 2007b). Indeed, nearly 60 per cent of its student population are fee-paying students. The significant proportion of fee-paying students warrants a careful examination of strategies to address attrition, as those students are potentially a distinctive group in terms of their backgrounds and their expectations of university (Krause et al., 2005).

In this context, the aims of this study are: to determine whether students from non-traditional sources exhibit different attrition patterns from those entering the university through traditional pathways, and to explore the impact of credit transfer on attrition.

In the next section the literature on attrition is reviewed in order to examine factors that have been found to contribute to student attrition. Following that, the data and the results of statistical analysis will be presented before we proceed with the discussion of the findings.

Literature Review

Much literature has been produced to explore student attrition in the higher education settings, which provides guidance as to possible factors that may influence attrition. Many factors have been considered to affect student attrition, and some of them are interrelated. Indeed, Tinto (1986, 1993) views student departure as a process of interaction between individual students' characteristics, the academic environment and the social environment. The key factors identified are summarised below.

Previous academic achievement

Academic achievement before entry is an important predictor of attrition. In the study conducted in the UK, it was found in the UK Open University, that attrition rates range from 20 per cent for those who already hold a degree to 50 per cent for those with no previous educational qualification (Simpson, 2003). An Australian study based on the Longitudinal Study of Australian Youth (LSAY) (McMillan, 2005) shows that academic achievement at school as measured by Equivalent National Tertiary Entry Ranking (ENTER) scores and other indexes is negatively related to attrition. It found an attrition rate from higher education of 5 per cent for those with ENTER scores of 90 or more and 23 per cent for those with ENTER scores of less than 70.

First preference

Whether the course is the first preference of students has a significant impact on students' persistence. The LSAY data (McMillan, 2005), for example, reveals that students who were enrolled in their first preference courses are less likely to change their course, as compared with students who were not enrolled in their first preference courses. For the students who enrolled in their first preference courses, 12 per cent changed their courses within a couple of years. In contrast, 18 per cent of students who did not enrol in their first preference courses departed.

A study of first year tertiary students' experience (Queensland Studies Authority, 2004) found that among the 3813 students who were enrolling in their first preference courses, only 9 per cent indicated they did not want to continue their courses, while 39 per cent of 1246 students who were not enrolling in their first preference courses, indicated that they did not want to continue. An analysis of the 2004 national enrolment data (Krause et al., 2005) showed that "students who do not receive their first course preference are likely to experience some frustration and dissatisfaction" (p.17).

Quality of teaching

Several studies have revealed that poor quality of teaching is one important reason for students not continuing their courses. An analysis by Callan (2005) on the students leaving their courses without receiving a degree or diploma shows that "the poor quality of the teaching staff", and "teachers did not have relevant industry experience" were the two most important reasons why students discontinue their programs, accounting for 20.9 per cent, and 20 per cent respectively among nine discontinuing reasons (p.20). Krause et al. (2005) suggest around one third of students surveyed did not consider that academic staff paid enough interest to their progress or provided helpful feedback (p .62). Findings in LSAY reveal that the most commonly nominated reason for changing to another institution was that the second institution provided a better quality of education (Hillman 2005). Similar conclusions were drawn from a study in the UK (Yorke, 1999).

Basis of entry

Studies have revealed that students with different ways of entry demonstrate differences in their attrition rates. The DEST (2004) figurers show that school leavers commencing in undergraduate courses in 2002 had an attrition rate of 17.4 per cent in 2002. This is compared with the overall rate for domestic commencing undergraduate students of 21.2 per cent. An analysis of the attrition rate at Victoria University suggests that students with portfolio assessment entry had lower attrition rate than other school leavers (Gabb, 2005).

Financial ability

To some extent, student departure is an economic decision. Thus, if the cost of attending a college or a university exceeds the benefit of attendance, students will drop out. And students' ability to pay and their perceptions of the costs of education influence their persistence (Braxton and Hirschy, 2005). Therefore financial factor is one important reason that affects students' dropout decision. A study conducted by the Department of Education in the United States found that low income students were less likely than not-low-income students to have attained a degree or certificate or be still enrolled (U.S. Department of Education, 2000-169, 52, cited by Schuh, 2005, pp. 284-285). A recent Australian study also revealed that among the first year students who left their programs, 42 per cent indicated that cost was a problem (Queensland Studies Authority, 2004).

Family support
Studies have indicated that family support influences students' commitment to the institution and course satisfaction (Cabrera et al., 1993). Terenzini and Wright (1987) noted that families can be either a supportive asset or a source of stress as relationships change. Parental encouragement related more to satisfaction for males (Bean and Vesper, 1992).

Parent education
The LSAY survey found that students whose parents had not completed high school were more likely to withdraw than those whose parents had completed a degree or diploma program (McMillan, 2005). Interestingly, the latter students were more likely to change their course than the former.

Language background
Non-English speaking background (NESB) students have been shown to have lower attrition rates than English speaking background (EBS) students (James et al., 2004). Similarly, a recent LSAY study also found a substantial difference in attrition rates from higher education between students from an English-speaking background and those from a language background other than English: the English-speaking background students had an attrition rate of 16 per cent, and the non-English speaking students had an attrition rate of 7 per cent (McMillan, 2005).

Mode of Study (Part-time or Full-time)
There are many studies showing that those who study part-time are more likely to leave their courses than those who study full-time (Astin and Oseguera, 2005; Hillman, 2005; Krause et al., 2005). However, an LSAY study based on the 1995 cohort found no significant difference in attrition rate between full-time and part-time students (McMillan, 2005).

Time of dropping out
It is widely accepted that the majority of the attrition occurs within the first year. A study of a large sample of university and college students in the USA (Nora et al., 2005) indicated that some 25 per cent of the cohort was lost between initial enrolment and second year. The LSAY (McMillan, 2005) also suggested that almost half of the attrition in the higher education sector in Australia happened during the first year.

Credit Transfer
Despite nearly 20 years in practice, the impact of credit transfer on attrition has not been well explored in Australia. Ramsay et al. (1997) have reviewed credit transfer practice at UniSA, but the impact on attrition was not examined. Studies in other countries return mixed results. Field (2004) suggested that those who enter higher education from further education colleges in Scotland are disproportionately likely to leave without achieving a qualification. Research by Cejda and Reway (1998) indicates that the overall retention rate of transfer students was much lower than native students (students who enter the university directly from secondary school). However, the retention rate of transfer students who had achieved GPA 3.0 above or had completed an associated degree is comparable to that of native students. In contrast to above studies, a Canadian study has shown that while the community college students took longer to graduate, those who do not drop out do as well or better academically than direct-entry high school students (Bell, 1998). Anglin et al. (1995) also found that graduation rate of the urban community college transfer students was equal to, or better than, a matched population of native students.

To conclude, the existing literature has produced a theoretical foundation and a range of possible explanations regarding student attrition. However, in many ways the results are inconclusive. Therefore, research based on data of an Australian university is not only useful to test the theory, but should also provide insights for further strategies and actions tailored to the needs of universities in a similar situation.

Data and Statistical Analysis

The data cover all students enrolled in and withdrawn from a program in 2005 in Business Division at UniSA. The data set was generated by Student and Academic Services (SAS) in early 2006 at our request. Since SAS maintains records of student's action and time of the action, this data set only includes students whose action code is either active (enrolled) or cancelled (withdrew) in 2005. The data, summarised in Table 1, therefore, represent students who were either enrolled or withdrew in 2005.

This paper studies the issue of student attrition by examining what factors and how they influence students' drop out decision. We use action codes to retrieve student status of "withdraw" and "non-withdraw". This can avoid the cumulative problem of dropout students, i.e. avoids the problem that the number of withdrawn students becomes a function of how long "withdrawn" students are kept within the database, as the student can only withdraw once in a year.

Guided by the literature, we requested the following information: student ID, gender, basis of admission, program, commencement date, academic loading, home campus, credits received, funding sources, language spoken at home, country of birth, postcode of current home address. The same information was requested for both enrolled and withdrawn students.

Table 1: Student Composition at UniSA in 2005

Division	Contribution Scheme	Fee-paying Domestic	Fee-paying Overseas	Others	Total
Division of Business	4091	822	4807	101	9821
Division of Education, Arts and Social Science	8033	525	1557	278	10393
Division of Health Science	3679	449	855	99	5082
Division of Information Technology, Engineering and Environment	2664	244	2476	140	5524
Others	575	15	241	52	883

Source: UniSA web site: http://www.unisa.edu.au/pas/bai/statistics/statistics-student.asp

Table 2: Summary of Enrolled and Withdrawn Students in Business Division in 2005

		Enrolled		Withdrawn	
Category	Variables	Total	Proportion (%)	Total	Proportion (%)
Gender	Female	5242	51.9	214	48.4
	Male	4858	48.1	228	51.6
Birth Country	Australia	4270	42.3	222	50.2
	Non-Australia	5830	57.7	220	49.8
Home Spoken Language	English	4846	48.0	255	57.7
	Chinese	3788	37.5	55	12.4
	Other	1466	14.5	132	29.9
Credits Received	Received	4173	41.3	112	25.3
	Not Received	5927	58.7	330	74.7
Funding source	Contribution Scheme	1787	17.7	132	29.9
	Fee-Paying	5677	56.2	170	38.5
	Other	2636	26.1	140	31.7
Basis of Admission	Higher Education Course	5633	55.8	225	50.9
	TAFE	699	6.9	28	6.3
	Secondary School	1987	19.7	132	29.9
	Mature Aged	471	4.7	20	4.5
	Other	1310	13.0	37	8.4
Commencing Year	2005	3938	39.0	210	47.5
	2004	3276	32.4	126	28.5
	Before 2004	2886	28.6	106	24.0
Academic Load	Full-time	5545	54.9	258	58.4
	Part-time	4555	45.1	184	41.6

Source: Data provided by Student and Academic Services at University of South Australia.

Table 2 provides a snapshot of the sample population based on the information. There are records of 10,100 enrolled students, and 442 withdrawn students. Note that we have found that the records include 210 students whose statuses were in both enrolled and withdrew in 2005. As the number was considered to be an insignificant proportion of the sample, we have excluded it from the sample.

A binary regression model was employed for the study. The logistic distribution function was chosen as the link function in the model. The independent variables we consider are gender, birth country, language spoken at home, source of funding, location (onshore/offshore), academic load, credits received, basis of admission, and admit term. Table 3 provides detailed descriptions of the data.

We begin with fitting the model with all independent variables. We then delete the independent variable, which has been found to be most insignificant from the model and re-estimate the model. The process repeats by deleting one variable from the model each time until the model no longer provides a better fit according to the Bayesian Information Criterion (BIC). The following independent variables have been excluded from the final model during the process: basis of admission (mature aged), location (offshore), academic load (fulltime),

admission year (2004), funding source (contribution scheme), language (English), gender (female) and basis of admission (TAFE).

Table 3: Descriptions of Variables

Variables	Description
Dependent Variable	Non-dropout =0, Dropout = 1
Independent Variables	
Gender	Female = 1, Male = 0
Birth Country	Australian = 1, Non-Australian = 0
Home Spoken Languages	
English	English = 1, Otherwise = 0
Chinese	Chinese = 1, Otherwise = 0
Others	Other languages = 1, Otherwise = 0
Source of Funding	
Contribution Scheme	Contribution Scheme = 1, Otherwise = 0
Fee-Paying	Fee-Paying=1, Otherwise = 0
FPOS (Fee-paying Overseas Students)	FPOS = 1, Otherwise=0
Others	Other source = 1, Otherwise = 0
Location	Onshore = 1, Offshore = 0
Academic Load	Full-Time = 1, Part-Time = 0
Credits	Received = 1, Not Received = 0
Basis of Admission	
Higher Education	Higher education=1,otherwise=0
TAFE	TAFE=1, Otherwise=0
Secondary School	Secondary school=1, Otherwise=0
Mature Aged	Mature Aged=1, Otherwise=0
Other	Others= 1, Otherwise = 0
Admit Term	
2005	2005 = 1, Otherwise = 0
2004	2004 = 1, Otherwise = 0
Other	Others= 1, Otherwise = 0

The estimation results of the final regression model are presented in Table 4. Apart from constant variable, we found the following independent variables are statistically significant: birth country (Australia), language spoken at home (Chinese), Funding Source: Fee-paying student, Fee-paying overseas students (FPOS); receiving credit, basis of admission (higher education courses; secondary school), and admit term (2005). Among them, language spoken at home (Chinese), receiving credit and funding source: FPOS and fee-paying are negatively related with the dependent variable, which means students falling in those categories are less likely to drop out. On the other hand, students who had taken higher education course before, who were school leavers, and who were in their first year at UniSA were more likely to drop out. More specific results are reported as follows:

1. Awarding credits to students for their previous study is negatively related to the decision of drop out.
2. Fee-paying students are less likely to drop out from the program.

3. Students who were born in Australia are less likely to drop out from a program, compared to their overseas-born peers.
4. A sub-group of international students, namely Chinese speaking background students, are less likely to dropout from university.
5. First year students are more likely to withdraw from a program.
6. There is not enough evidence to show that students who are studying part-time are more likely to drop out.

Table 4: Logistic Regression Results

Independent Variables	β	S.E.	Exp(B)
Basis of Admission _ Higher Education Course	0.379***	.143	1.461
Basis of Admission _ Secondary School	0.269*	.151	1.308
Credit _ Received	-0.449***	.122	.638
Admit Term_2005	0.339***	.099	1.403
Language _Chinese	-0.422**	.167	.656
Funding _ FPOS	-0.927***	.184	.396
Funding _ Fee Paying	-0.664***	.205	.515
Birth Country _Australia	-0.561***	.136	.570
Constant	-2.593***	.163	.075

Notes: *** = significant at 1%; ** = significant at 5%; *= significant at 10%, β = regression coefficient associated with independent variables, S.E.: standard errors.

Discussion

Some of the findings are consistent with what have been reported in the literature, such as the fact that first year students are more likely to drop out. However, there are some interesting findings in this study.

Firstly, in contrast to what has been suggested in the literature, results of this study indicate that local students (students who were born in Australia) are more likely to stay in a program, while students who were born overseas are more likely to drop out.

Secondly, awarding credits to students for their previous studying appears to have a positive impact on retention. Awarding credits is similar to the practice of recruiting students from community colleges, as students receive credits from the courses they have done in the colleges. Several studies even indicate that students transferred from community colleges are more likely to drop out, results from this study suggests that granting credit to students should discourage attrition.

Thirdly, the opportunity cost of education may positively contribute to retention. The results indicate that both domestic fee-paying students and overseas fee-paying students are less likely to drop out. Being funded by the government (contribution scheme) does not have a statistically significant impact on student withdraw decision. One plausible explanation is that students who have incurred higher opportunity costs (tuition fee, costs of living in a foreign countries etc) are less likely to drop out. This may also imply that financial costs of education are not necessarily a barrier for students to complete their study.

Fourthly, students who are traditionally considered as disadvantaged are not necessarily more likely to drop out. Neither studying part-time, nor being mature aged students, nor

coming from TAFE, nor studying offshore was a statistically significant explanatory variable for attrition. Students born in Australia appeared more likely to stay, so did overseas fee-paying students. An explanation could be that disadvantaged students who choose to study are highly motivated to be successful. The other explanation could be that UniSA provides good support for such students, so that it becomes less difficult for them to go through the program.

Lastly, there is a sub-group of students whose home spoken language is Chinese. As indicated early in the paper, this was the second largest group of students in terms of language spoken at home. The results show that this group is less likely to drop out, while being in other language groups is not a significant contributor either negatively or positively to attrition. Given Australian universities' exposure in the Asian market, this presents an interesting area for further study.

In conclusion, the study has revealed the factors that contribute to student attrition in the Business Division in a higher education institution with diverse student body. Clearly it should be borne in mind that the results presented in this paper may be of institution-specific limitation and further research using other research approaches such as interviews with students may provide deeper understanding of the complicated phenomena of student attrition.

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References

Anglin, Leo W., et al. 1995. "Do Transfer Students Graduate? A Comparative Study of Transfer Students and Native University Students." *Community College Journal of Research and Practice*, 19:4, pp. 321-30.

Astin, A.W. and L Oseguera. 2005. "Pre-College and Institutional Influences on Degree Attainment," in *College Student Retention.* A. Seidman ed. West Port, CT: American Council on Education, pp. 245-76.

Bean, J.P. and N. Vesper. 1992. "Student Dependency Theory: An Explanation of Student Retention in College." Association for the Study of Higher Education.

Bell, Stephen. 1998. "College Transfer Students: A Canadian Case." *Community College Journal of Research & Practice*, 22:1, pp. 21.

Braxton, J.M. and A.M. Hirschy. 2005. "Theoretical Developments in the Study of College Student Departure," in *College Student Retention: Formula for Student Success*. A. Seidman ed. West Port, CT: American Council on Education, pp. 61-88.

Cabrera, A. F., et al. 1993. "College Persistence: Structural Equations Modeling Test of an Integrated Model of Student Retention." *Journal of Higher Education*, 64:20, pp. 123-37.

Callan, Victor. 2005. "Why Do Students Leave? Leaving Vocational Education and Training with No Recorded Achievement." The National Centre for Vocational Education Research (NCVER): Adelaide.

Cejda, Brent D. and Kirsten L. Rewey. 1998. "The Effect of Academic Factors on Transfer Student Persistence and Graduation: A Community College to Liberal Arts College Case Study " *Community College Journal of Research & Practice*, 22:7, pp. 675.

DEST 2004. "Higher Education Attrition Rates 1994-2002: A Brief Overview. Research Note No. 1." http://www.dest.gov.au/NR/rdonlyres/8A245011-4F59-4D99-9D97-A1AD89D0C669/1043/1.pdf. Accessed Oct 1, 2006

DEST 2006. "Learning and Teaching Performance Fund 2007 Process." 2007 Learning & Teaching Performance Fund. http://www.dest.gov.au/NR/rdonlyres/F31C1821-625B-4CA8-8F43-8B49C6E076AE/14645/LearningTeachingPerformanceFund2007Process22Nov200.rtf.

Field, J. 2004. "Articulation and Credit Transfer in Scotland: Taking the Academic Highroad or a Sideways Step in a Ghetto?" *Journal of Access Policy and Practice*, 1:2, pp. 85-99.

Gabb, R. 2005. "Retention and Progress of Students with Portfolio Enrolment." Victoria University: Melbourne, Australia.

Hillman, K. 2005. "The First Year Experience: The Transition from Secondary School to University and TAFE in Australia." Australian Council for Educational Research: Camberwell.

James, R., et al. 2004. "Analysis of Equity Groups in Higher Education 1991-2002." Department of Education Science and Training: Canberra.

Krause, K.-L., et al. 2005. "The First Year Experience in Australian Universities: Findings from a Decade of National Studies." Department of Education Science and Training: Canberra.

McMillan, J. 2005. "Course Change and Attrition from Higher Education." Australian Council for Educational Research: Camberwell.

Nora, A., et al. 2005. "Student Persistence and Degree Attainment Beyond the First Year in College: The Need for Research," in College Student Retention: Formula for Student Success. A. Seidman ed. West Port, CT: American Council on Education, pp. 129-54.

Queensland Studies Authority. 2004. "Attrition and Persistence of First-Year Tertiary Students in Queensland: Longitudinal Research Study." Queensland Studies Authority: Brisbane.

Ramsay, Eleanor, et al. 1997. "Cross-Sectoral Linkages: A Case Study." http://www.dest.gov.au/archive/highered/erppubs/eip97-13/front.html. Accessed August 3, 2007

Schuh, J. H. 2005. "Finances and Retention: Trends and Potential Implications," in *College Student Retention: Formula for Student Success*. A. Seidman ed. West Port, CT: American Council on Education, pp. 277-94.

Simpson, O. 2003. *Student Retention in Online, Open and Distance Learning*. London: Kogan Page.

Terenzini, P. and T. Wright. 1987. "Influences on Students' Academic Growth During Four Years College." *Research in Higher Education*, 26, pp. 161-79.

Tinto, V. 1986. "Theories of Student Departure Revisited," in *Higher Education: A Handbook of Theory and Research*. J. Smart ed. New York: Agathon Press, pp. 359-84.

Tinto, V. 1993. *Leaving College: Rethinking the Causes and Cures of Student Attrition*. Chicago: The University of Chicago Press.

UniSAInfo. 2007a. "2005-12-26 Enrol Stats - Whole Year." Vol. 2007. http://www.unisa.edu.au/unisareport/default.asp. Accessed July 26

UniSAInfo. 2007b. "Access and Participation 2005 Total Year." Vol. 2007. http://www.unisa.edu.au/unisareport/default.asp. Accessed July 26

Yorke, M. 1999. "Leaving Early: Undergraduate Non-Completion in Higher Education." Falmer: London.

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