THE DIVERSITY AND PERFORMANCE OF THE STUDENT POPULATION AT VICTORIA UNIVERSITY

A PRELIMINARY ANALYSIS

JUNE 2008

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PREFACE FROM THE VICE-CHANCELLOR AND PRESIDENT

Victoria University (VU) welcomes the clear intention of the Commonwealth Government to make education pivotal to its social inclusion agenda. The University has been committed to social inclusion through education for more than 90 years, working with people from all backgrounds to broaden their life and employment options.

This monograph reports on a unique study undertaken by the University in 2008 to explore the success rates for different segments of our highly complex student body. VU is a multi-sector institution serving a low income, diverse community in the west of Melbourne. VU's student population varies across a number of dimensions that are central to current policy debates, including socio-economic status, cultural and language diversity, the interaction between work and study and the differences and similarities between vocational and higher education students.

While this study is intended to improve the ability of VU to support its own students, it may also provide insights for national policy and other education providers facing similar complex educational challenges.

The largest group of VU students come from the west of Melbourne, an old manufacturing region with low participation in post-secondary education and a high proportion of low-income households. VU has the highest proportion of low SES students in the State of Victoria in terms of access and participation, at 24% in 2006. VU exceeds the State and National averages for participation, retention and success of these students and many are the first in their family to attend university.

The western region of Melbourne is also the destination for new immigrants and is now a complex mix of first, second and third generation migrants. Many of these people speak languages other than English at home, a fact that complicates their educational opportunities particularly when they are recent migrants.

The educational hurdles faced by people who combine low income with a first generation non-English speaking background are great indeed. VU is the only Australian university with high levels of both types of students, being in the 'top ten' of all universities for both the SES and NESB dimensions. Other universities combine a high proportion of low SES with a high proportion of Indigenous students which brings another set of cultural and linguistic challenges.

This study on *The Diversity and Performance of the Student Population at Victoria University* is the most recent example of VU's determination to understand the challenges faced by our students and to use the evidence to help design services that will improve their chances of success.

The study illustrates a number of student segments that are served by the University, each with its own suite of characteristics and chances of success. While socio-economic background is bound up in the educational chances of our students, so too is their migrant experience, culture and capability in the English language, among other things.

The complex interaction of the major dimensions of SES, migrant status and English language capability deserves close examination in the design of national policy for migrant communities in Australia, as much as it does in the shaping of our own institutional response at Victoria University. In an increasingly globalised society, the lessons learned about VU's diverse student population in the west of Melbourne will have resonance for similar communities nationally and internationally.

Professor Elizabeth Harman
VICE-CHANCELLOR and PRESIDENT

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LIST OF ACRONYMS

ABS	Australian Bureau of Statistics
BIC	Bayesian Criterion
CALD	Cultural and Linguistic Diversity
CCD	Census Collectors Districts
DFP	Davidson-Fletcher-Powell
EFTSL	Equivalent Full-Time Student Load
FE	Further Education
GLS	Generalised Least Squares
HED	Higher Education
LOTE	Language other than English
MLCR	Modular Load Completion Rate
NESB	Non-English Speaking Background
NES	Non-English-Speaking
SCH	Student Contact Hours
SEIFA	Socio-economic Indexes for Areas
SES	Socio-economic Status
VE	Vocational Education
VUSIS	Victoria University Student Information Service

EXECUTIVE SUMMARY[1]

This report examines aspects of the diversity of the student body at Victoria University over the period 2003-07, and how that diversity and other factors influence student outcomes, as measured by progression rates. It is based on an analysis of selected data contained in the University's operational database for the period 2003-2007 inclusive. Over this period the data cover 350,000 unit records of student enrolments, involving 130,000 different students, although progression rates are only available for 2007. Three main matters are investigated: aggregate measures of the diversity of Victoria University's student population, cluster analysis to identify significant segments within that population and an analysis of the factors influencing student progression rates in 2007.

Overall Characteristics of the Student Population

In terms of aggregate measures of student enrolments (uncorrected for student load), the student population has changed sharply over that period. Total enrolments dropped in 2004, but have since recovered steadily; the share of international students has risen from one in six in 2003 to nearly one in four in 2007. Overall the data show a pattern of enrolments strongly affected by demographic and educational changes and by the diverse impact of a strong economic boom, and experiencing of a sharp shock in 2004. Since 2004, substantial progress has been made in rebuilding enrolments of domestic students in full-time degree courses and of international students generally, especially in Certificate III and IV courses. However there are persistent lower levels of postgraduate enrolments.

Other important characteristics of the student body that are documented in this study include:

- Students at Victoria University are heavily involved in the labour market, with over 80% either working or seeking work. Rates of unemployment have declined over the period, but perhaps not as much as might be suggested by strong economic conditions.
- In addition to the rising role of international students there is a strong influence of migration on the Australian citizen or resident student body: more than half of all students at Victoria University speak a language other than English at home and have a father born outside Australia.
- Students at Victoria University on average come from socio-economic backgrounds well below the Melbourne average and, as is common through the educational system, the level of family disadvantage in considerably higher in TAFE courses than in higher education courses. About 75% of students in the University come from families in the bottom half of Melbourne's socio-economic distribution.

Key Segments within the Student Population

The initial cluster analysis has revealed evidence of three main segments within the Australian student body. The first segment (young, full-time Australian degree students) has a much higher than average share of females and of students working part-time, and is heavily focused on full-time study for an

[1] The authors would like to acknowledge the key role of Elizabeth Harman in initiating and supporting this project, and the ongoing management oversight of Stephen Weller. We are also most grateful for the enthusiastic and skilled support provided by Steven Wojnarowki, particularly in relation to the provision of the data through Business Objects and spatial mapping of clusters and socio-economic status, and vital inputs from Peter Davenport and Jim Lang. Comments from Conor King, Roger Gabb and others within the University community have also been most helpful.

undergraduate degree. Students in this segment tend to be much younger than the student mean, and to come from families with a higher than average share of fathers born in Australia and of addresses in the east of Melbourne. The three SEIFA indexes produced by the Australian Bureau of Statistics (ABS) to measure socio-economic position (economic disadvantage, economic resources and occupational and educational structure) are used to assess the position of the student's family, by geo-coding family addresses to ABS collector districts. For this first segment, the mean values are higher than the student mean but still below the Melbourne average for all three SEIFA indexes. Of the three segments, this is the strongest group in terms of the SEIFA index on education and occupation. However, this segment remains well below the overall University average in terms of postgraduate study.

Relative to other students, those in the second cluster (disadvantaged Australian students) tend to have lower labour force attachment; study part-time in non-degree courses (but are well represented at the postgraduate level); be considerably older than the student mean; have a higher proportion of fathers born in Asia or Africa; speak a language other than English or Chinese at home; and have much lower scores on all SEIFA indexes than both the student mean and the Greater Melbourne mean. This segment appears to consist of a large group of students from a second generation migrant background, whose families have not established a strong position in Australia but for which the University's programs (other than the undergraduate degree program) offer an important entry into post-secondary education.

The third cluster (working, third-generation Australian students) tends to be heavily involved in part-time study and full-time work. They also have an above-average share in diplomas or TAFE courses, their fathers are predominantly born in Australia, they speak English at home, and are concentrated in other campuses in the West other than Footscray Park and at the City campus. They show the highest mean value of the three clusters for the SEIFA index for socio-economic disadvantage, but are below the second cluster on the SEIFA index of education and occupation status.

In terms of international students, which might be considered as a fourth segment, we utilise a limited set of information on international students to examine whether these are a homogeneous group, using the same methodology as for the Australian students. The two-stage cluster analysis revealed that there exist three distinct groups of international students. The first group is identified as 'onshore, full-time, full-fee paying' students, the second as 'offshore TAFE' students and the third as 'offshore higher education full-fee paying' students. The offshore TAFE group is the largest segment amongst international students.

An Analysis of Progression Rates

The analysis of student progression rates for 2007 provided in the report both reinforces and adds to the findings of the existing literature, including previous studies of retention rates at Victoria University.

Australian Higher Education Students

For all Australian higher education students in 2007, four groups of variables showed a statistically significant impact on progression rates, after controlling for all other factors:

- *age and gender*: student age was positively associated with progression rates, and females had significantly higher rates than males;

- *level of engagement in study and work*: there was a significant positive effect of studying full-time rather than part-time but, after controlling for this and other effects, those who were working full-time also had higher progression rates;
- *socio-economic status*: the SEIFA Economic Resources Index variable was positively linked to higher progress rates;
- *ancestry and cultural and linguistic diversity (CALD):* 'English spoken at home' had a positive impact on progress rates, while a CALD background (i.e. the interaction of LOTE and ancestry) was an impediment to academic progression for both first and second generation Australians. However, students of the first generation seem to do much better than others when their parents are able to improve their SES.
- *membership of segments 2 and 3*: being a member of segment 2 or segment 3 was also positively linked to progression rates in the higher education sector but often negatively related to progress rates in the TAFE sector.

This analysis was undertaken using a generalised least squares Probit analysis, and it is important to note that the effects reported above are after allowing for the effects of the other variables included in the analysis.

One notable finding here is that, for higher education students, membership of segments 2 and 3 also had a positive effect on progression. This suggests that factors to do with the characteristics or motivation of these students (such as their age and experience, and their determination to succeed) and/or some features of the University's programs for them were positive influences on the progression rate. It should be noted, however, that only about 16% of segment 2 students are in higher education. There was, however, no positive effect for higher education students associated with the western region of Melbourne.

Australian TAFE Students

For Australian TAFE students, many of the results for higher education students remain, but there are some variations. For the *demographic* variables, progression rates are again positively and strongly influenced by age, but there is no gender effect. The *engagement effect* is even more pronounced, with strong positive links between progression rates and both full-time study and full-time work, but also a significant negative association with not being in employment. For TAFE students, being actively engaged in full-time work and/or full-time study has a positive effect on progression, whereas not being in any employment has a negative effect.

Socio-economic and CALD effects remain strong, but are somewhat different than for higher education students. The positive effects of higher economic resources (SEIFA 2) remain significant at the 1% level, but the English language effect is only marginally significant. However, for these students, parental background is highly significant, with a strong positive effect from having both parents born overseas, but a strong negative effect from having a father born in Africa. It may be that parents born overseas give strong impetus to the child's progress in the TAFE area, and that in this area lower English language capability at home is less of a liability in terms of student performance. Also, in contrast to higher education, it is TAFE students of second generation Australians that to do better than others when their parents are able to improve their SES.

By contrast with the higher education case, being a *member of segment 2* or *segment 3* has a strong negative effect on progression for TAFE students, but here there is a strong positive effec t from coming from a family based in the western region of Melbourne. There may be a case for further

attention to the needs of TAFE students in segment 2, but the results do suggest that students from the West are, ceteris paribus, doing better than other students in TAFE.

More limited data are available on international students, and in particular there is no information on the socio-economic characteristics of the student's family background. But for international students in higher education some of the key findings above are reproduced: other things being equal, older students have better progression rates than younger ones, female students progress better than male students and those in full-time studies do better than those in part-time studies. Each of these relationships is significant at the 1% level. For international students progression rates are higher for students in heath, engineering and business studies; for the latter two areas this is in contrast to the results for Australian students.

1 INTRODUCTION

The report presents some results of a project to analyse the diversity within the student body at Victoria University and to identify the main clusters or segments within that population. It is intended that this work will add to the University's knowledge base about its students and their place within the community, and hence contribute to improved learning and performance outcomes, to more effective equity programs and to marketing activities.

The study is based on data from the Victoria University Student Information Service (VUSIS), accessed in February 2008. VUSIS is an operational database in regular use, updated on a daily basis, so that the information used is specific to the date of access. The project database contains 350,000 unit records of student enrolments for the period 2003-2007 inclusive, covering 130,000 different students. Given the operational focus of VUSIS, different types of enrolments are treated differently, but for higher education students the basic unit of record is the enrolment for a given course for a semester. The central measure used in this analysis is unique student enrolments in each year, where the enrolment activity of a given student in a particular year is the unit of analysis. Unique student enrolments are close to but differ in some respects from reportable enrolments, a measure commonly used for reporting purposes, and are quite different from student load, as no attempt has been made to adjust to a full-time equivalents basis. Of the 130,000 students with records on the database, 108,000 have provided an Australian home address (which may differ from the address at which they live during the academic year), and some 92,000 of these have been successfully geocoded to Census Collectors Districts (CCDs) for the 2006 Census year. This allows the full range of economic and social information on individual CCDs available from the Census to be utilised in the analysis.

This report is in three parts subsequent to this introduction. In Section 2 we report the results of a two-variable cross-tabulation analysis of the student data set, both for Australian and international students in aggregate and for the major course categories. In Section 3 we report results of a cluster analysis of the student population, to identify the characteristics of three main clusters into which the students of Victoria University fall. Further, we discuss aspects of the geographical distribution of students, based on home address, and some of the characteristics of the neighbourhoods from which Australian students are drawn with special emphasis on the distribution of student clusters and socio-economic disadvantage. In Section 4 we report the results of an analysis of the factors influencing student progress rates.

2 SOME KEY CHARACTERISTICS OF THE STUDENT POPULATION, 2003-07

2.1 COMPOSITION AND TRENDS BY NATIONAL STATUS, AGE, GENDER AND COURSE TYPE

In 2003 five out of six students enrolled were Australian and only 16.4% were international students. The composition has changed sharply over the period to 2007, when international students provided one quarter (24.3%) of all enrolments, while the Australian share has fallen to three quarters (75.7%).

In terms of Australian students, the main change in the period under study was in 2004, when enrolments fell by 11.0%. As shown in Table 1, this decline was spread across all age-groups, with the younger students (21-25) group being the least affected, only 5.3%, and was evident for both males and females. Domestic enrolments fell further over 2004-06, especially in the above 25 years age groups and for males, but at a much slower annual rate of 2.2%. The decline in the female group stopped, and the 21-25 age group increased slightly. In 2007 enrolments of Australian students began to rise, with overall growth of 1.4% driven entirely by increase in female enrolments. In conclusion, despite the recovery in the recent period, the Australian student numbers in 2007 have not yet reached the 2003-2005 levels.

Table 1: Australian Students by Age and Gender

		YEAR					PER CENT CHANGE OVER:		
		2003	2004	2005	2006	2007	2003-04 (%)	2004-06 (%)	2006-07 (%)
AGE	**16-20**	17759	15644	16008	15114	15413	-11.9	-3.4	2.0
	21-25	8783	8317	8476	8639	8701	-5.3	3.9	0.7
	26-36	9105	8010	7552	7229	7210	-12.0	-9.8	-0.3
	37+	10528	9110	8504	8289	8490	-13.5	-9.0	2.4
GENDER	**Female**	22502	20105	20269	20072	20634	-10.7	-0.2	2.8
	Male	23673	20976	20271	19199	19180	-11.4	-8.5	-0.1
TOTAL		**46175**	**41081**	**40540**	**39271**	**39814**	**-11.0**	**-4.4**	**1.4**

Trends in enrolments of international students have been quite different, with strong growth near or above 10% per annum evident in all four years (Table 2). The growth has been particularly marked among those aged 16-20 years (perhaps reflecting the rapid growth in offshore delivery of TAFE programs), and among female students, who now outnumber males in both international and Australian student categories.

Table 2: International Students by Age and Gender

		YEAR					PER CENT CHANGE OVER:		
		2003	2004	2005	2006	2007	2003-04 (%)	2004-06 (%)	2006-07 (%)
AGE	16-20	2367	3348	3245	4889	6185	41.4	46.0	26.5
	21-25	4104	4456	4606	4398	4244	8.6	-1.3	-3.5
	26-36	2095	1981	1930	1629	1655	-5.4	-17.8	1.6
	37+	492	466	556	437	526	-5.3	-6.2	20.4
GENDER	Female	3734	4464	4656	5605	6373	19.6	25.6	13.7
	Male	5324	5787	5681	5748	6237	8.7	-0.7	8.5
TOTAL		**9058**	**10251**	**10337**	**11353**	**12610**	**13.2**	**10.8**	**11.1**

Reflecting these diverse trends, total university enrolments fell by 7.1% in 2004, stabilised over 2005 and 2006 and then increased strongly (by 3.6%) in 2007 (Table 3). Comparing 2007 with 2003, the number of students 25 years or less and the number of female students have risen, partially offsetting a sharp fall in the number of students over 25 years and in male students.

Table 3: All Students by Age and Gender

		YEAR					PER CENT CHANGE OVER:		
		2003	2004	2005	2006	2007	2003-04 (%)	2004-06 (%)	2006-07 (%)
AGE	16-20	20126	18992	19253	20003	21598	-5.6	5.3	8.0
	21-25	12887	12773	13082	13037	12945	-0.9	2.1	-0.7
	26-36	11200	9991	9482	8858	8865	-10.8	-11.3	0.1
	37+	11020	9576	9060	8726	9016	-13.1	-8.9	3.3
GENDER	Female	26236	24569	24925	25677	27007	-6.4	4.5	5.2
	Male	28997	26763	25952	24947	25417	-7.7	-6.8	1.9
TOTAL		**55233**	**51332**	**50877**	**50624**	**52424**	**-7.1**	**-1.4**	**3.6**

These trends conceal considerable variation by sector and by broad course type. The fall in 2004 was heavily concentrated in the TAFE sector (10.3%), with higher education enrolments decreasing by only 2.0% (Table 4). In 2007 both sectors have improved significantly, with an increase of 2.8% in higher education and 4.1% in TAFE.

The strongest improvement has been with full-time degree students, whose enrolments were 19.5% higher in 2007 than in 2003. By comparison, part-time enrolments have fallen steadily, dropping by 24.6%. In 2004 all enrolments in all course types other than the full-time degree students fell, but from 2005 onwards trends were varied: postgraduate enrolments continued decreasing in 2005 and 2006 before stabilising in 2007; diploma enrolments increased remarkably in 2005, fell again in 2006 before increasing strongly in 2007; Certificate I and II enrolments were lower in 2007 than in any preceding

year; and Certificate III and IV enrolments rose by 16.2% over 2005 and were higher in 2007 than in 2003.

Table 4: Student Enrolments by Sector and Course Type

	YEAR					PER CENT CHANGE OVER:		
	2003	2004	2005	2006	2007	2003-04 (%)	2004-06 (%)	2006-07 (%)
Higher education	21467	21035	21191	21155	21745	-2.0	0.6	2.8
TAFE	33766	30297	29686	29469	30679	-10.3	-2.7	4.1
Postgraduate	5703	5551	4971	4291	4297	-2.7	-22.7	0.1
Degree/Honours FT	11235	11507	12095	12844	13422	2.4	11.6	4.5
Degree/Honours PT	3764	3117	3199	2976	2839	-17.2	-4.5	-4.6
Diplomas	12048	10865	12254	10342	11490	-9.8	-4.8	11.1
Certificate III & IV	14243	13658	12306	13365	14548	-4.1	-2.1	8.9
Certificate I & II	7725	6102	5570	6302	5317	-21.0	3.3	-15.6
TOTAL	**55233**	**51332**	**50877**	**50624**	**52424**	**-7.1**	**-1.4**	**3.6**

Overall these data show a pattern of enrolments strongly affected by demographic and educational changes and by the diverse impact of a strong economic boom, and experiencing a sharp shock in 2004. Since 2004 enrolments of domestic students in full-time degree courses and of international students generally, especially in Certificate III and IV courses, have substantially improved. The trend of diminishing postgraduate enrolments appears to have been halted in 2007, and may take some time to revert to previous levels.

2.2 LABOUR FORCE STATUS

Summary data on the labour force status of Australian students are provided in Table 5. No reliable data are available on international students, as more than half report their status as 'unknown'. The labour market status of Australian students appears to be most closely related to the type of course undertaken and to prevailing economic conditions. In the TAFE sector, full-time employed students predominate, at a stable level of around 30% through the period, followed by part-time employed students at around 27-28%. Interestingly, the proportion of students not in the labour force was practically identical at the beginning of the period in both sectors (about 16%), but has since steadily diverged, and was much higher in TAFE sector, with 21.3% in 2007. The proportion of TAFE students unemployed and seeking full-time work has fallen over 2003-07, but the share seeking part-time work has risen. In the higher education sector, the decrease in both students seeking work and those not in labour force was accompanied by a remarkable increase of part-time employed students.

Table 5: Labour Force Status of Australian Students

	YEAR				
	2003	2004	2005	2006	2007
	(PER CENT OF STUDENTS)				
TAFE STUDENTS					
Full-time employee	30.5	31.0	30.7	30.2	29.0
Part-time employee	28.0	28.5	28.0	26.8	27.0
Unemployed – seeking full-time work	10.1	9.5	8.1	8.0	7.4
Unemployed – seeking part-time work	14.5	14.7	15.7	15.5	15.3
Not in labour force	16.9	16.3	17.5	19.5	21.3
Total	100	100	100	100	100
HIGHER EDUCATION STUDENTS					
Full-time employee	16.8	16.2	15.6	15.7	16.3
Part-time employee	41.0	42.0	44.5	47.5	47.0
Unemployed – seeking full-time work	2.4	2.1	1.8	1.7	1.6
Unemployed – seeking part-time work	23.7	23.5	22.4	20.1	20.4
Not in labour force	16.1	16.1	15.7	14.9	14.7
Total	100	100	100	100	100

2.3 LANGUAGE SPOKEN AT HOME AND FATHER'S REGION OF BIRTH

One central aspect of Victoria University's diversity is clearly ethnicity, as reflected both in terms of the country of origin of the Australian students and their families and in terms of the language spoken at home. There are some difficulties in getting complete data from the VUSIS database on language spoken at home, due to the inability to distinguish multi-lingual households from those for which a language other than English is the main language.

It is evident from Table 6 that in 2007, excluding those students for which the language situation is unknown, over 40% of Australian students reported use of a language other than English at home, and that this share has been increasing, especially since 2005. The growth in African and Asian languages is particularly striking.

Table 6: Australian Students by Language Spoken at Home

	YEAR					PER CENT CHANGE OVER:	
	2003	2004	2005	2006	2007	2003-05 (%)	2005-07 (%)
English	29802	25600	25184	23734	23633	-15.5	-6.2
Other than English	16373	15481	15356	15537	16181	-6.2	5.4
Of which:							
Chinese	1326	1153	1123	1140	1270	-15.3	13.1
Vietnamese	2643	2490	2434	2527	2664	-7.9	9.5
Other Asian	2630	2513	2489	2583	2808	-5.4	12.8
Greek	1078	994	943	947	903	-12.6	-4.3
Italian	1201	1086	938	900	822	-21.9	-12.3
Spanish	838	777	820	828	815	-2.2	-0.6
Other European	3885	3586	3448	3296	3263	-11.3	-5.4
Arabic	1284	1238	1417	1394	1463	10.4	3.2
Turkish	742	717	761	772	740	2.6	-2.8
African language	675	858	916	1108	1390	35.8	51.7
TOTAL	**46175**	**41081**	**40540**	**39271**	**39814**	**-12.2**	**-1.8**
Unknown[1]	**6905**	**7027**	**8157**	**8995**	**8539**	**18.1**	**4.7**

Note: [1]Unknown values in this table have been distributed pro-rata across language groups; this item shows the total number of students for which language at home is unknown.

Table 7 shows that for the majority of international students, Chinese or another Asian language is spoken at home. Overall, more than half of the University's students come from a home which is either multi-lingual or in which a language other than English is spoken.

Table 7: International Students by Language Spoken at Home

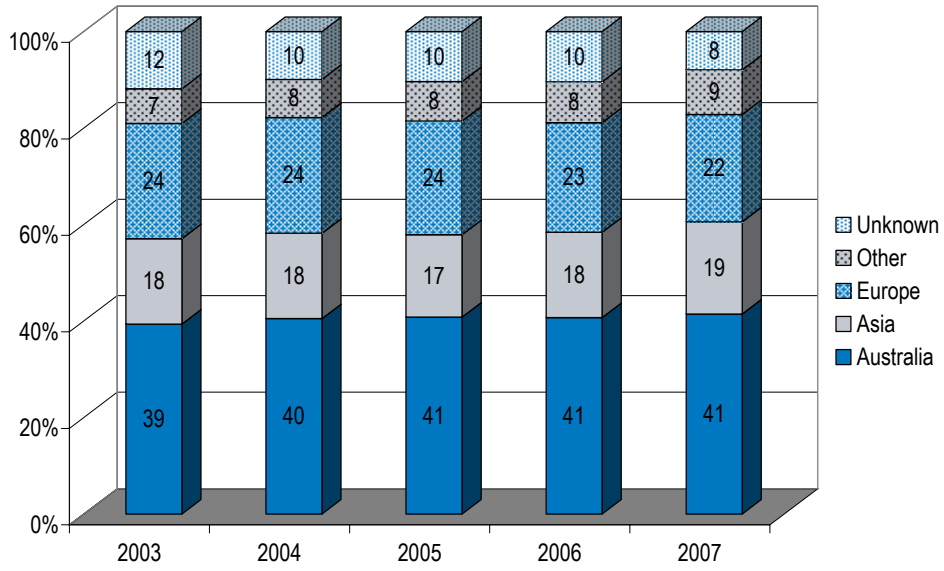
	YEAR					PER CENT CHANGE OVER:	
	2003	2004	2005	2006	2007	2003-05 (%)	2007-05 (%)
English	656	600	626	574	634	-4.6	1.3
Chinese	4147	5616	5467	7064	7831	31.8	43.2
Vietnamese	709	189	208	185	253	-70.7	21.6
Other Asian	2417	2572	2458	1849	2110	1.7	-14.2
Other European	260	346	324	307	402	24.6	24.1
Middle Eastern	154	181	201	166	196	30.5	-2.5
African	41	43	94	135	162	129.3	72.3
Other	10	5	3	11	16	-70.0	433.3
Unknown	664	699	956	1062	1006	44.0	5.2
TOTAL	**9058**	**10251**	**10337**	**11353**	**12610**	**14.1**	**22.0**

Note: As for Table 6, except that the unknown values have not been distributed.

The data on father's region of origin is summarised in Figure 1. After including those for which this region of origin is not known, the share of Australian students with fathers born in Australia is stable at

44%, with 56% of students having fathers born overseas. Within this latter group, the proportion of students with fathers born in Europe has decreased, and of those with fathers born in Asia has increased. One category that has been increasing rapidly from a low base is Australian students with fathers born in Africa.

Figure 1: VU Australian Students by Father's Region of Origin



2.4 SOCIO-ECONOMIC STATUS

To facilitate the analyses of the students' socio-economic status, and that of their families, we have assigned to each family the average characteristics of the Census Collection Districts (CCDs) in which they live, and aggregated the results over the full set of students for which geocoding results are available (92,000 unique students over five years) or over the subset of the data for which the analysis is being undertaken. Specifically, we have utilised a number of Socio-economic Indexes for Areas (SEIFA) products created by the Australian Bureau of Statistics. The indexes provide a ranking of CCDs on various dimensions, and are used as measures of the socio-economic status (SES) of the families.

Three SEIFA indexes are used:

- Index 1 measures unemployment and other forms of socio-economic disadvantage;
- Index 2 measures the economic resources available to families; and
- Index 3 measures education and occupation.

Some results from this analysis are summarised in tables 8-10, for each of the three SEIFA indexes. Further details of these indexes are provided in the Appendix.

Table 8: Family Backgrounds of Australian Students, by Course Type and SEIFA Index of Relative Socio-economic Disadvantage, 2006

	Value of the SEIFA Index at: Percentile			Greater Melbourne mean	Ratio to Greater Melbourne level at: Percentile		
	25th	50th	75th		25th	50th	75th
COURSE TYPE	**SEIFA Index 1: Economic Disadvantage**						
Postgraduate	967	1027	1077	1040	0.989	0.988	0.992
Degree/Honours FT	947	1013	1065	1040	0.968	0.973	0.982
Degree/Honours PT	934	1006	1058	1040	0.955	0.967	0.975
Diplomas or Certificate IV	924	995	1045	1040	0.945	0.957	0.963
Certificate III	923	991	1038	1040	0.943	0.953	0.956
Certificate I & II	889	967	1016	1040	0.909	0.929	0.936

Note: Overall VU student mean is 980, 94.2% of the Greater Melbourne mean.

Three main points are evident from these results. First the families of VU students are markedly below the Greater Melbourne mean on all three SEIFA indexes. The exception to this, for some indexes, is postgraduate students.

Table 9: Family Backgrounds of Australian Students, by Course Type and SEIFA Economic Resources Index, 2006

	Value of the SEIFA Index at: Percentile			Greater Melbourne mean	Ratio to Greater Melbourne level at: Percentile		
	25th	50th	75th		25th	50th	75th
COURSE TYPE	**SEIFA Index 2: Economic Resources**						
Postgraduate	955	1004	1051	1018	0.992	0.986	0.983
Degree/Honours FT	954	1004	1050	1018	0.990	0.986	0.982
Degree/Honours PT	948	997	1043	1018	0.984	0.979	0.975
Diplomas or Certificate IV	936	987	1031	1018	0.972	0.970	0.965
Certificate III	936	986	1031	1018	0.972	0.968	0.964
Certificate I & II	920	967	1013	1018	0.955	0.950	0.948

Note: Overall VU student mean is 986, 96.9% of the Greater Melbourne mean.

Second, there are persistent differences in the SES characteristics of students across course types, generally running from highest SES levels for postgraduate students to lowest for Certificate I and II students. This reflects both the role of SES in shaping access to higher education and the characteristics of VU's catchment areas. Third, many VU students come from very low SES backgrounds, with low SEIFA index scores for course types at the 25th percentile, especially for disadvantage and education and occupation indexes.

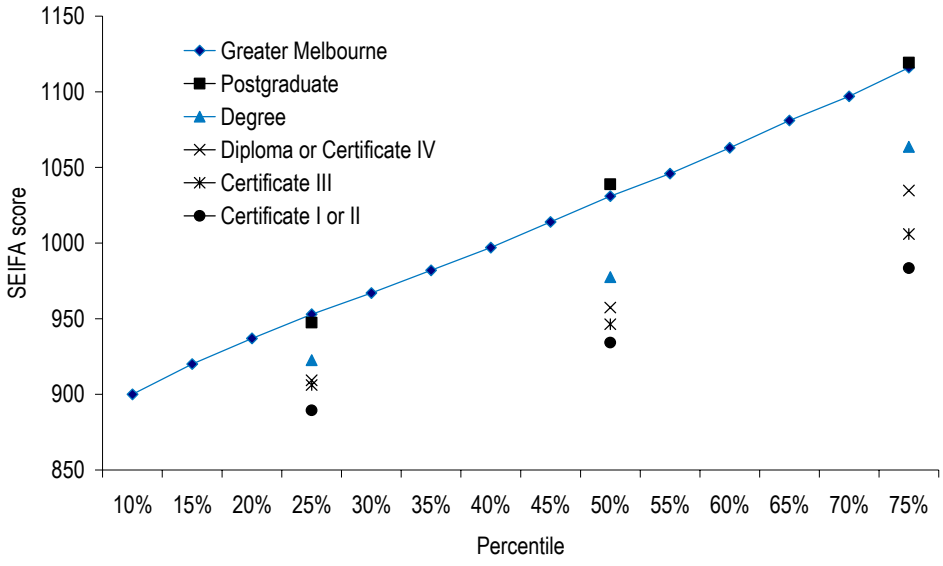
Table 10: Family Backgrounds of Australian Students, by Course Type and SEIFA Education and Occupation Index, 2006

	Value of the SEIFA Index at: Percentile			Greater Melbourne mean	Ratio to Greater Melbourne level at: Percentile		
	25th	50th	75th		25th	50th	75th
COURSE TYPE	**SEIFA Index 3: Educational and Occupational Structure**						
Postgraduate	947	1039	1119	1030	0.994	1.008	1.003
Degree/Honours FT	926	982	1062	1030	0.972	0.953	0.951
Degree/Honours PT	919	973	1066	1030	0.965	0.944	0.955
Diplomas or Certificate IV	909	957	1035	1030	0.954	0.929	0.927
Certificate III	906	946	1006	1030	0.951	0.918	0.901
Certificate I & II	889	934	984	1030	0.934	0.907	0.881

Note: Overall VU student mean is 990, 96.1% of the Greater Melbourne mean.

These central facts are illustrated in Figure 2, which compares the figures for the 25th, 50th and 75th percentiles for the students in various courses with the full household distribution for Greater Melbourne for SEIFA Index 2. This figure shows the joint impact of the lower than average socio-economic background of VU students (other than postgraduate students) and the systematic variation in socio-economic background by course type. These data imply that about 75% of VU Australian students come from backgrounds in the lower half of the socio-economic distribution in Melbourne.

Figure 2: Distribution of Households by SEIFA Education and Occupation Index, Greater Melbourne and VU Students, by Course, 2006



3 EXPLORATORY SEGMENT ANALYSIS

3.1 INTRODUCTION

This section reports the results of a two-step segment analysis. The procedure is an exploratory tool designed to reveal natural groupings (i.e. segments). The algorithm considers both categorical and continuous variables, and also determines the optimal number of segments. The maximum number of segments was set to six, the distance measure that determines the similarity between segments was the log-likelihood measure, and the Schwartz's Bayesian Criterion (BIC) was used by the automatic segmenting algorithm. In this report, both the Australian and international student populations enrolled in 2007 were analysed in the segment analyses.

We first present the initial results of student segment analysis for unique student enrolments in 2007. We begin with Figure 3 that has the results of segment analysis. This clearly shows the presence of four distinct segments. In the accompanying legend, we have summarised the segments as follows:

- segment 1 – young, full-time degree Australian students;
- segment 2 – disadvantaged Australian students;
- segment 3 – working, third-generation Australians; and
- segment 4 – international students.

Note that the disadvantaged students made up 32% of the total VU student population in 2007. Further cluster analysis of international students also reveals the presence of three different segments, and is summarised in Figure 4. These segments are as follows:

- segment 1 – full-fee paying students studying full-time in Australia;
- segment 2 – offshore TAFE students; and
- segment 3 – offshore higher education full-fee paying students.

The offshore TAFE group is the largest group comprising of 40% of international students.

Figure 3: VU Student Segments, All Students, 2007

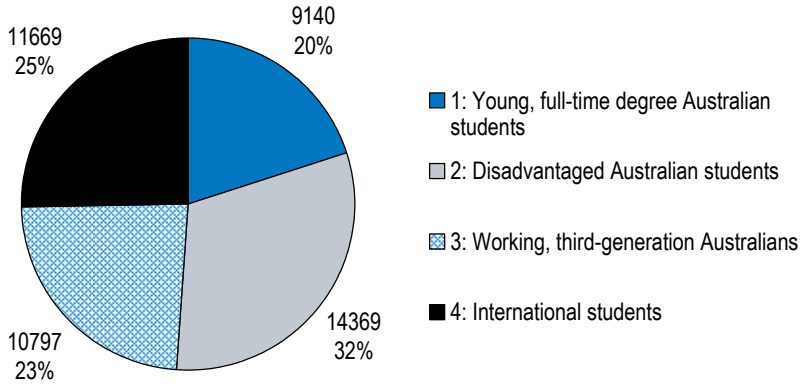
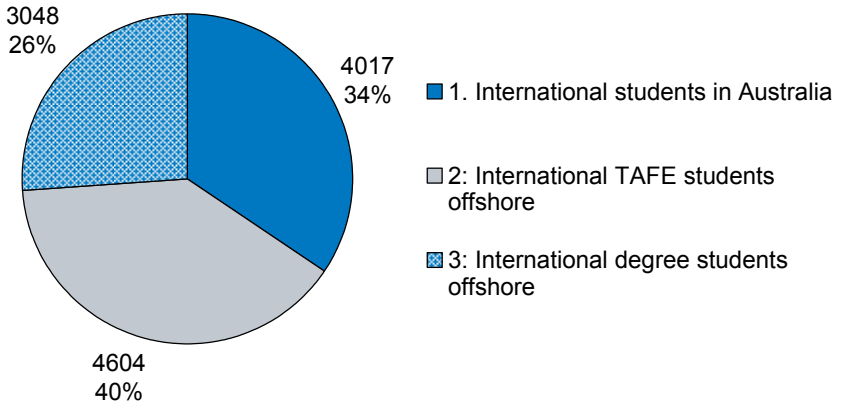


Figure 4: VU International Student Segments, 2007



3.2 AUSTRALIAN STUDENT SEGMENTS

Cluster analysis involves a multivariate analysis of student characteristics, including demographics, socio-economic background, ancestry and educational preferences. For Australian students, we considered the following ten variables: gender; age; an ABS SEIFA index; labour force status; attendance mode; course type/level; two indicators of parents' place of birth; language spoken at home;[2] and region.[3]

Table 11 summarises the distribution of segments across the three key VU sectors: higher education (HE), vocational education (VE) and further education (FE). The table shows that more than two thirds of the higher education sector is made up of 'young, full-time degree Australian students'. It is also encouraging to find that 17.1% and 54.1% of students in the higher education and VE sectors come from the disadvantaged segments. Disadvantaged students constitute 84.7% of students in the FE sector.

Table 11: Segment Distribution by VU Sector, Australian Students, 2007 SEIFA

	HE SECTOR		VE SECTOR		FE SECTOR	
SEGMENT	Count	%	Count	%	Count	%
1. **Young, full-time degree Australian students**	8821	69.3	283	1.4		
2. **Disadvantaged Australian students**	2174	17.1	10671	54.1	1524	84.7
3. **Working, third-generation Australians**	1734	13.6	8788	44.5	275	15.3

Figures 5 and 6 depict the segment means for the two continuous variables used in the analysis: age, and the SEIFA index of relative educational and occupational status.[4] Note that lower score values in both of the SEIFA indices indicate a disadvantage. Figure 5 shows that students in segments 2 and 3 are older than those observed in segment 1.

[2] This is defined as 'The main language spoken at home, or if the student listed more than one language, the first language other than English listed by the student.' Thus, a language other than English does not necessarily imply that English is not spoken at home.

[3] On the basis of ABS statistical subdivisions, this variable classified regions into four main groups: 'Inner', 'East', 'North' and 'West'. The first consists of the subdivisions of 'Inner Melbourne' and 'Eastern Middle Melbourne'. The second group consists of , 'Moreland City', 'Boroondara City', 'Eastern Outer Melbourne', 'Yarra Ranges Shire Part A', 'Southern Melbourne', 'South Eastern Outer Melbourne', 'Frankston City', 'Greater Dandenong City' and 'Mornington Peninsula Shire'. The third includes 'Northern Middle Melbourne' and 'Northern Outer Melbourne'. Finally, the Western region consists of all other subdivisions.

[4] Earlier analysis included two ABS SEIFA indices: the relative index of socio-economic disadvantage, and the index of relative educational and occupational status. These two indices, however, correlate highly, especially for segments 1 and 3. As a result, we reduced the number of SEIFA indices to one. Note also the SEIFA index was calculated using data at the most disaggregated level available; that is, at the level of the Census Collection District (CCD). Thus, the SEIFA index should be interpreted with caution since the averages of all households in a particular district, rather than a direct characteristic of VU students were used.

Figure 5: 95% Confidence Intervals for Means of Age, 2007

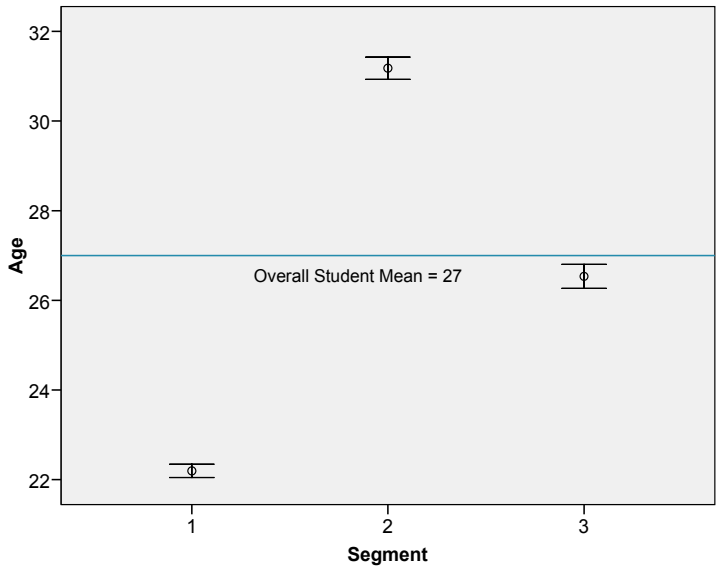
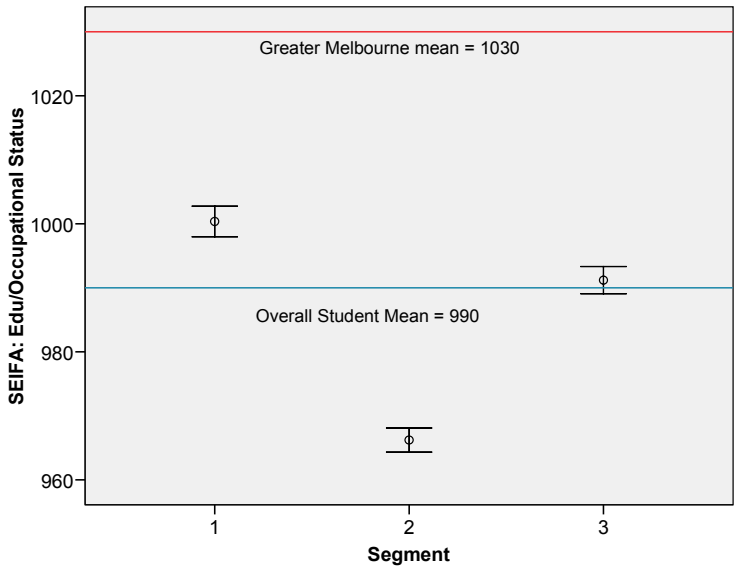


Figure 6 suggests that students in segment 2 face considerable social disadvantage. Segment 1 students seem to be better off in terms of educational and occupational status. The means of all three VU student segments are substantially below the corresponding means of the population in the Greater Melbourne area.

Figure 6: 95% Confidence Intervals for Means of SEIFA Index of Relative Educational / Occupational Status, 2007



Figures 7 to 14 provide further insights on additional key variables that have contributed the identification of the three segments. They present a visual summary of the distribution (in percentages) of eight variables within each segment.

Figure 7 depicts the distribution of gender by cluster. It appears that females predominate among the 'young, full-time degree students' (i.e. segment 1), reflecting in part the higher enrolment of female students discussed earlier.

Figure 7: Within Segment Percentage of Gender, 2007

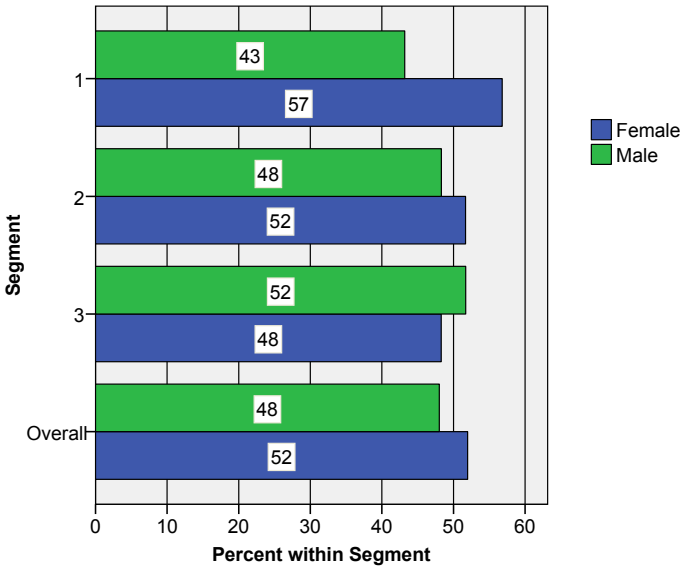


Figure 8 illustrates the differences in labour force status. Note that 69% of 'working, part-time students' (i.e. segment 3) are in full-time or part-time employment. This overall result is similar to that observed amongst 'young, full-time degree students' (i.e. segment 1), although only 8% of the latter are in full-time employment. These two groups contrast sharply with 'disadvantaged students' where only 40% are in employment.

Figure 8: Within Segment Percentage of Labour Force Status, 2007

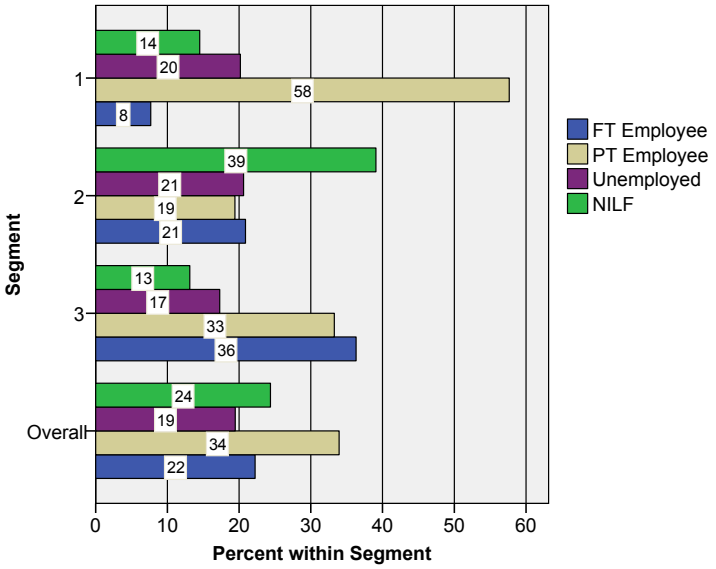


Figure 9 highlights study intensity as a dichotomous variable (i.e. full-time or part-time students). This identifies a clears distinction between entirely full-time students in segment 1 and predominately part-time students in segments 2 and 3.

Figure 9: Within Segment Percentage of Course Load, 2007

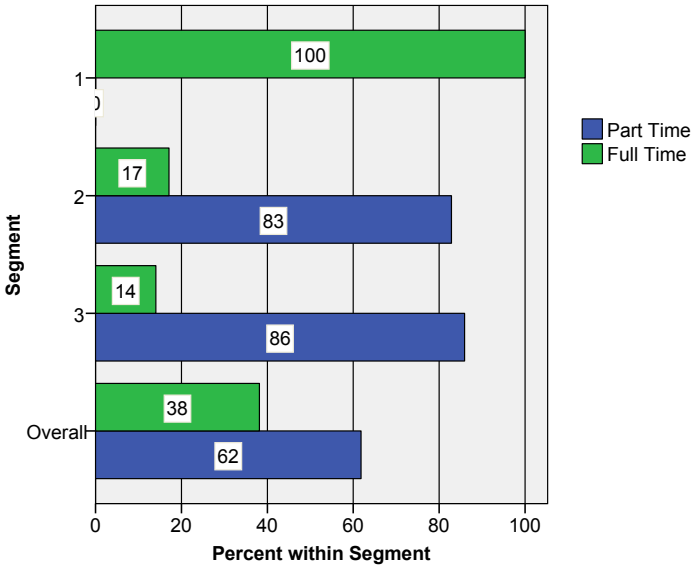
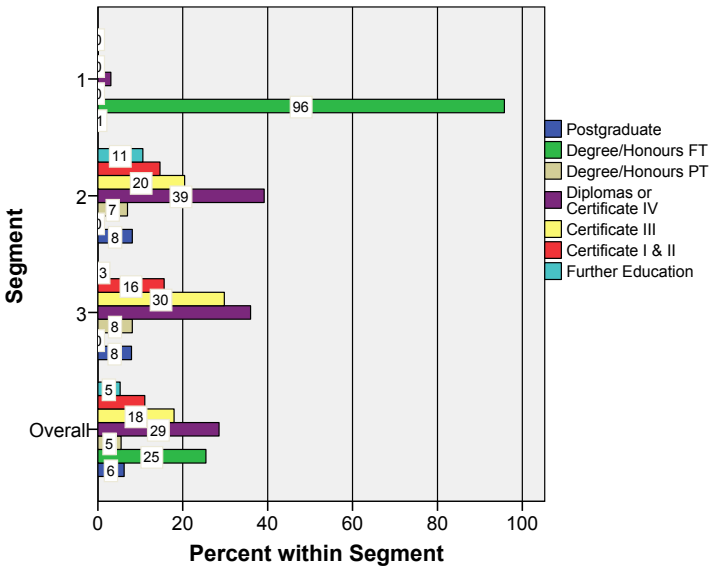


Figure 10 depicts the structure of the segments with regard to the course level. As can be observed, the majority of students in segments 2 and 3 (disadvantaged and working students) are enrolled in non-degree and TAFE courses, in contrast to the young, full-time degree students in segment 1. However, both the disadvantaged and working students are also represented at higher course levels, e.g. at the postgraduate level, for both these segments, the share of postgraduate students is 8%, by comparison with only 1% for segment 1.

Figure 10: Within Segment Percentage of Course Level, 2007



Figures 11, 12 and 13 provide a more detailed picture of ancestry and linguistic diversity. As indicated in Figure 11, working, part-time students in segment 3 are mostly third generation Australians who speak mainly English at home.[5] In contrast, segment 2 consists almost entirely of disadvantaged Australian students both of whose parents were born overseas. It appears that in the disadvantaged group, students with fathers from Asia and Africa are highly represented, with a combined total of 45% (Figure 12).

Figure 13 illustrates the diversity across the three segments in language spoken at home, reflecting this ancestral diversity. One-third of segment 1 students (the full-time degree students) speak a language other than English at home, as do 70% of segment 2 students. But almost all segment 3 students speak only English at home.

[5] We define third generation Australians as those whose parents were born in Australia and speak only English at home. Second-generation Australian migrants are the students whose parents are born overseas and report speaking a language other then English (LOTE) at home.

Figure 11: Within Segment Percentage of Parents Country of Birth, 2007

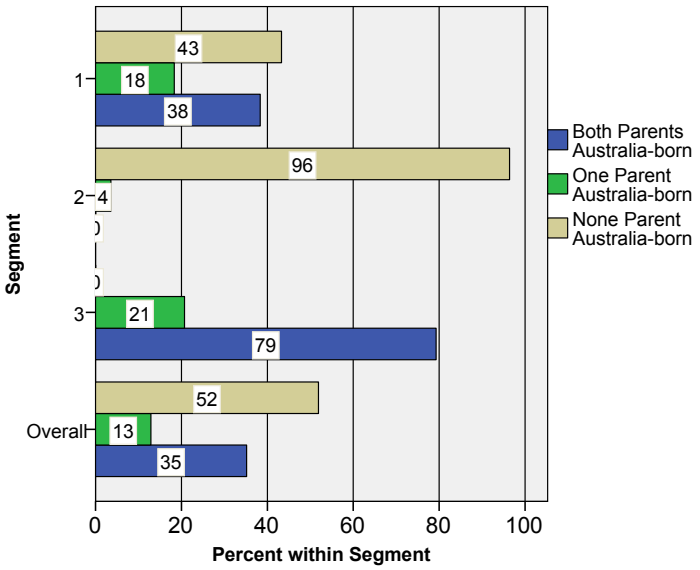


Figure 12: Within Segment Percentage of Father's Birthplace, 2007

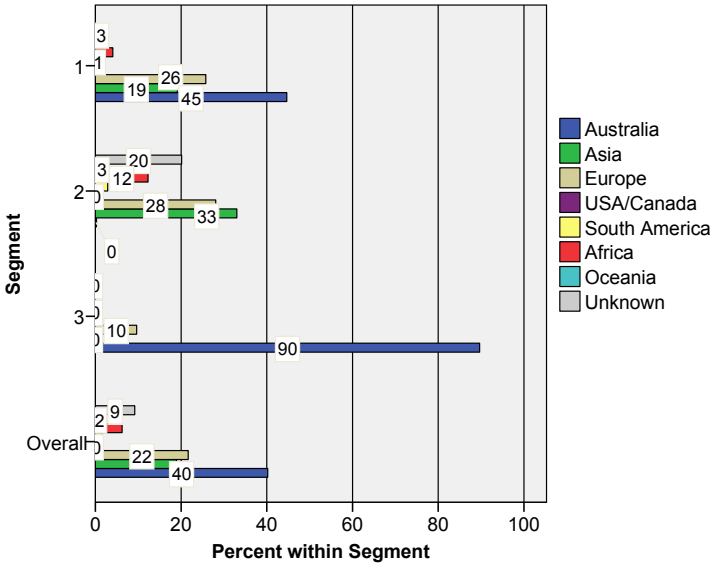


Figure 13: Within Segment Percentage of Language Spoken at Home, 2007

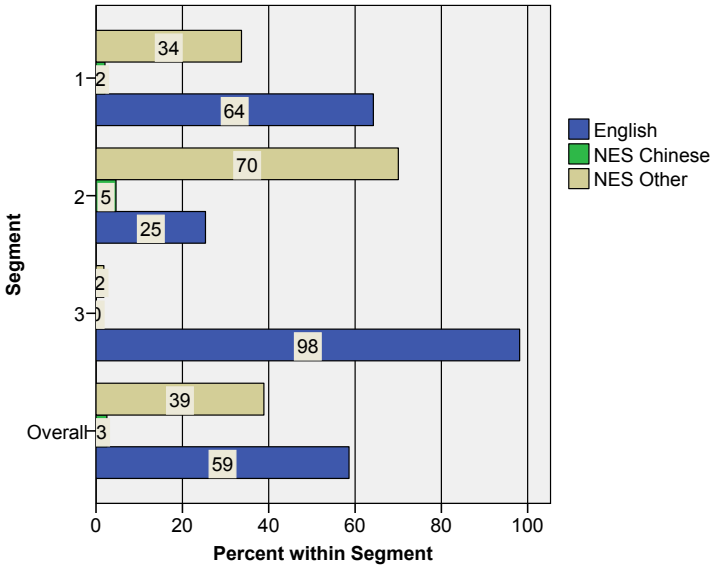
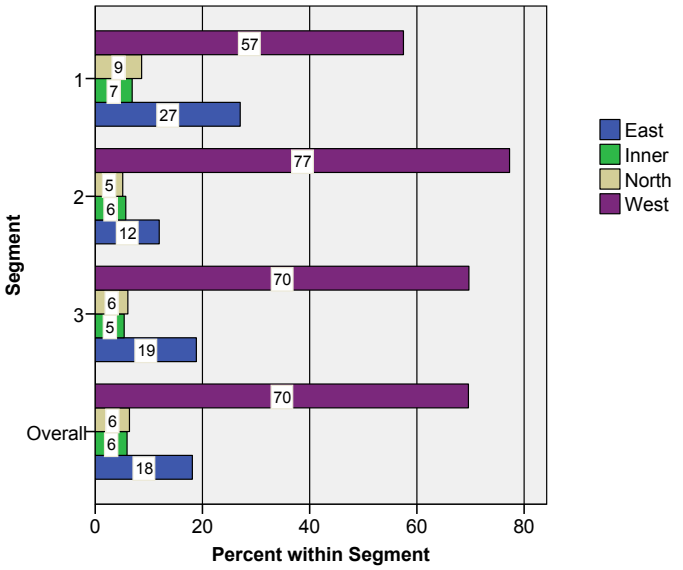


Figure 14 examines the spatial distribution of VU students by region. While the students from western suburbs are a majority in each segment, their proportions are very high among students in segments 1 and 2. A markedly lower proportion, 57%, of the 'young, full-time degree, students come from the West.

Figure 14: Within Segment Percentage of Region, 2007



Finally, we utilise ABS spatial data to map the SEIFA index of relative occupational/educational status by individual student for each segment. The results appear in figures 15 to 17. They confirm the view that VU students of low socio-economic background and of segment 2 (i.e. the disadvantaged) are not evenly distributed across Melbourne. In fact, they closely associate with western suburbs such as St. Albans, Sunshine, Hoppers Crossing and Melton. They also appear to come from suburbs in the north (e.g. Thomastown and Reservoir) as well as from the Dandenongs, Clayton and northern Melbourne. Segment 1 is also heavily located in the west but segment 3 seems more evenly distributed.

Figure 15: Segment 1 Geographical Distribution by Census Collection District, 2007

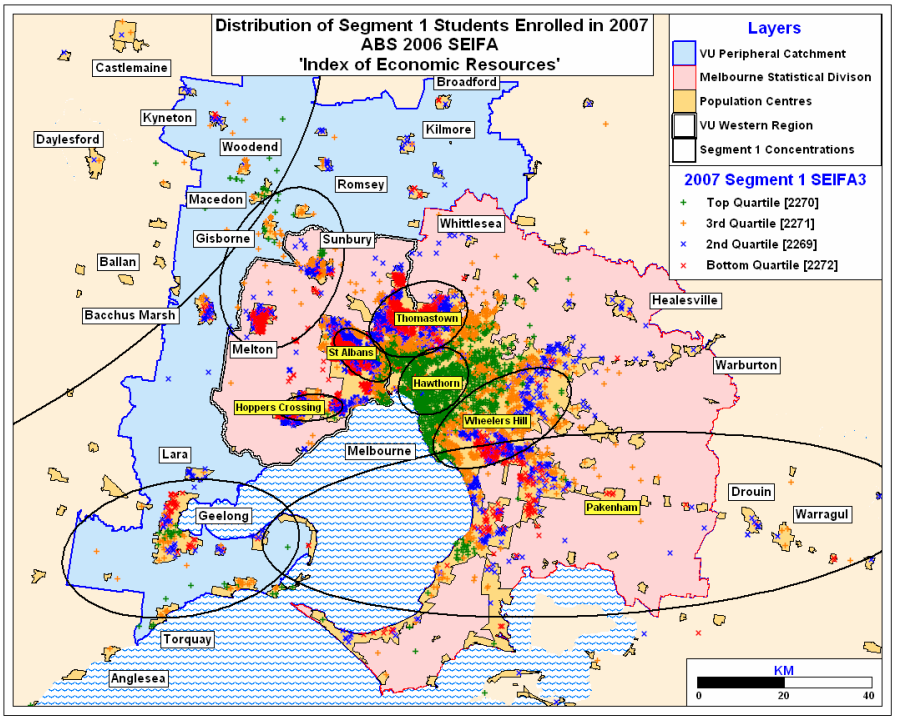


Figure 16: Segment 2 Geographical Distribution by Census Collection District, 2007

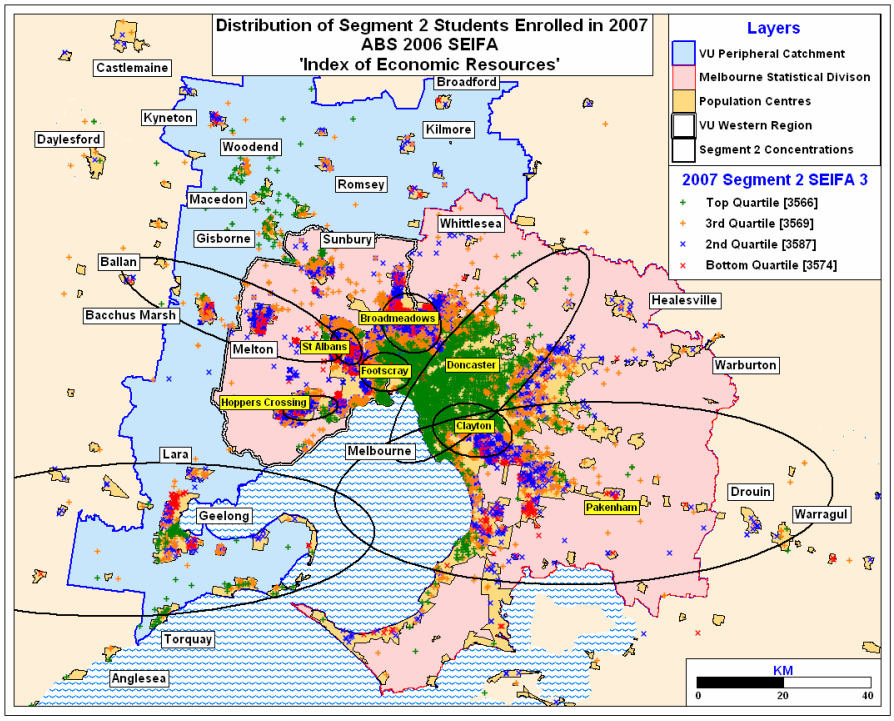
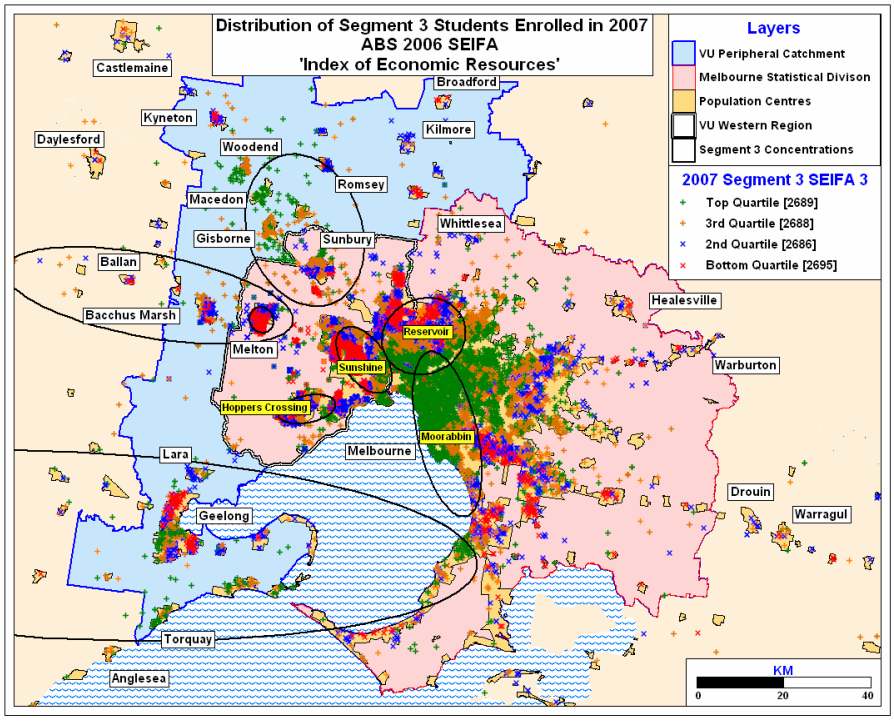


Figure 17: Segment 3 Geographical Distribution by Census Collection District, 2007



In summary, the cluster analysis above indicates the existence of three major segments for VU Australian students. We have identified these segments as follows.

Segment 1: *Young, full-time degree Australian students*
- Relatively young
- Relatively high SEIFA score but lower than Melbourne mean
- Predominately part-time employment
- Full-time studies in higher education sector and degree courses
- Evenly distributed between English and LOTE languages

Segment 2: *Disadvantaged Australians*
- Relatively mature-aged
- Relatively very low SEIFA score
- Substantially detached from the labour force
- Predominately part-time studies in VE and FE sectors but also postgraduates
- Mainly second-generation Australians and mainly from Asia and Africa
- A LOTE spoken at home

Segment 3: *Working, third-generation Australian*s
- Relatively high SEIFA score but lower than Melbourne mean
- Employed, mainly on full-time basis
- Predominately part-time studies in VE and FE sectors but also postgraduates
- Third-generation English-speaking Australians

3.3 INTERNATIONAL STUDENT SEGMENTS

Finally, we utilise a limited set of information on international students to examine whether these are a homogeneous group. We again employ the same empirical methodology as above. As outlined above, the two-stage cluster analysis revealed that there exist three distinct groups of international students. The first group is identified as 'onshore, full-time, full-fee paying' students, the second as 'offshore TAFE' students and the third as 'offshore higher education full-fee paying' students. We repeat that the offshore TAFE group is the largest segment amongst international students.

The following variables were used to define the characteristics set of international students: age; gender; attendance mode; course type/level; father's place of birth; language used at home, and course funding source. Figures 18-23 presents some of the key variables by segment.

Figure 18 clearly shows that 'offshore TAFE' students are much younger than students in the other two segments.

Figure 18: International Students, 95% Confidence Intervals for Means of Age, 2007

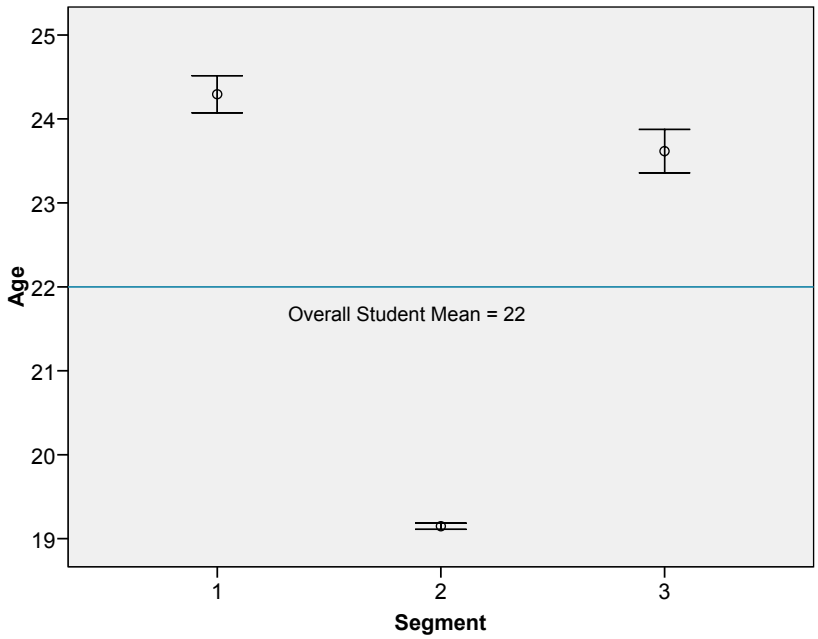


Figure 19 shows that women seems to be over-represented amongst 'offshore TAFE' students, while 10% more men than women come to Australia to study as international students.

Figure 19: International Students, Within Segment Percentage of Gender, 2007

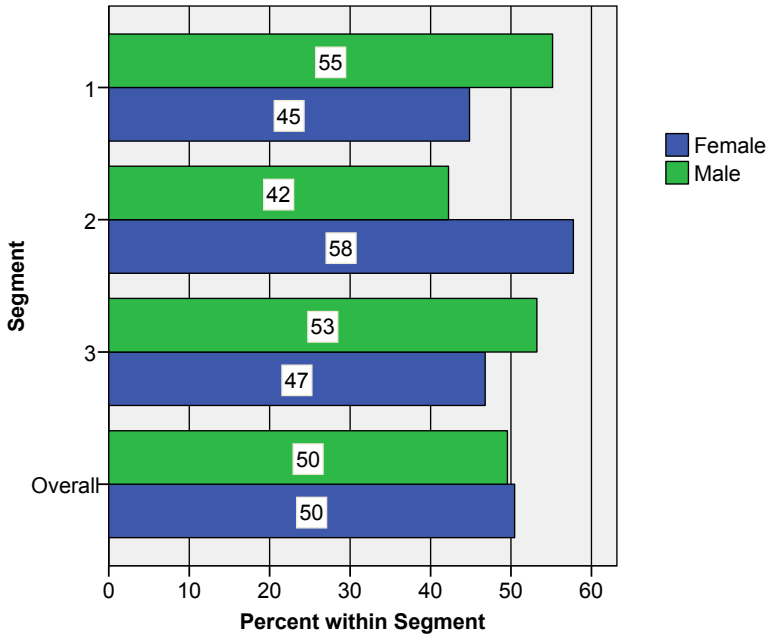


Figure 20 also reveals that full-fee paying international students (both onshore and offshore) focus heavily on full-time studies.

Figure 20: International Students, Within Segment Percentage of Course Load, 2007

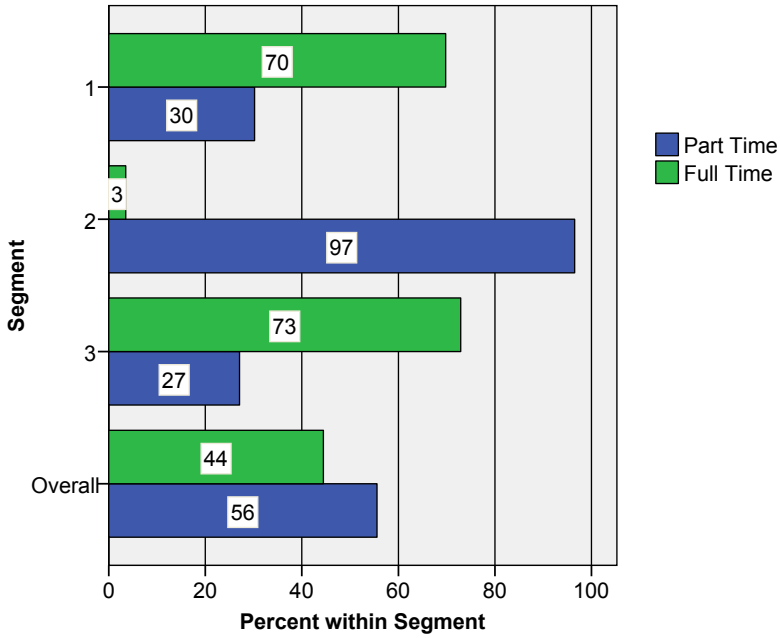
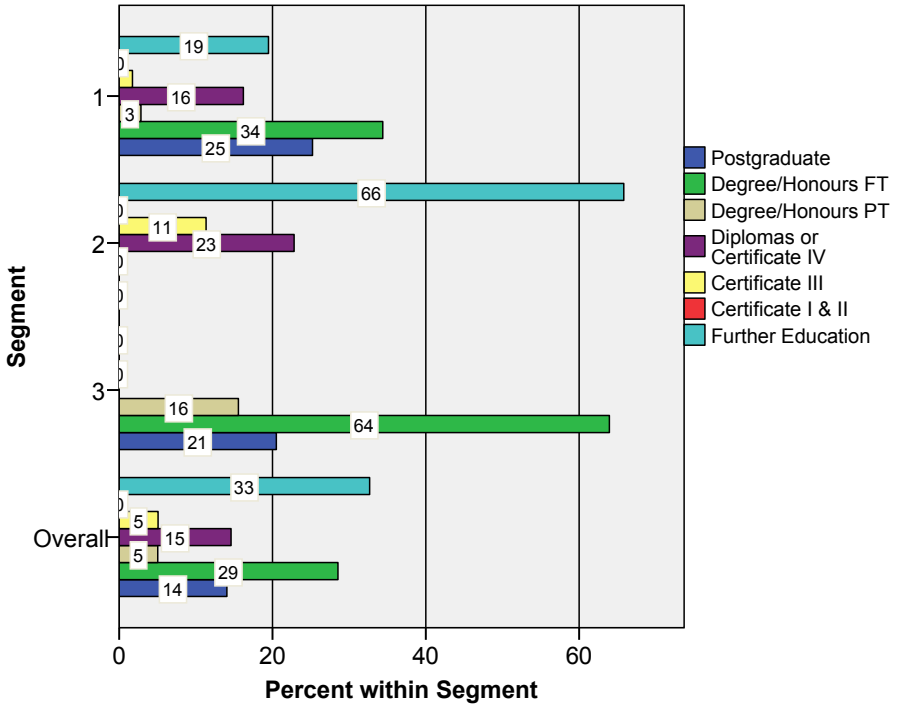


Figure 21 suggests that 19% and 16% of international students who study in Australia are in the FE and VE sectors respectively. On the other hand, 'offshore, TAFE' students mainly appear in the FE sector while the rest are in the VE sector. In contrast, offshore full-fee paying students are only in the higher education sector and particularly in full-time degree courses.

Figure 21: International Students, Within Segment Percentage of Course Level, 2007



Not reported here, data on father's birthplace suggests that 74% of international students studying in Australia are of Asian ancestry. Figure 22 also reveals that 'offshore TAFE' students are in Chinese-speaking countries.

Finally, Figure 23 clearly divides the three segments according to the source of funding as reported by the VUSIS database.

Figure 22: International Students, Within Segment Percentage of Language, 2007

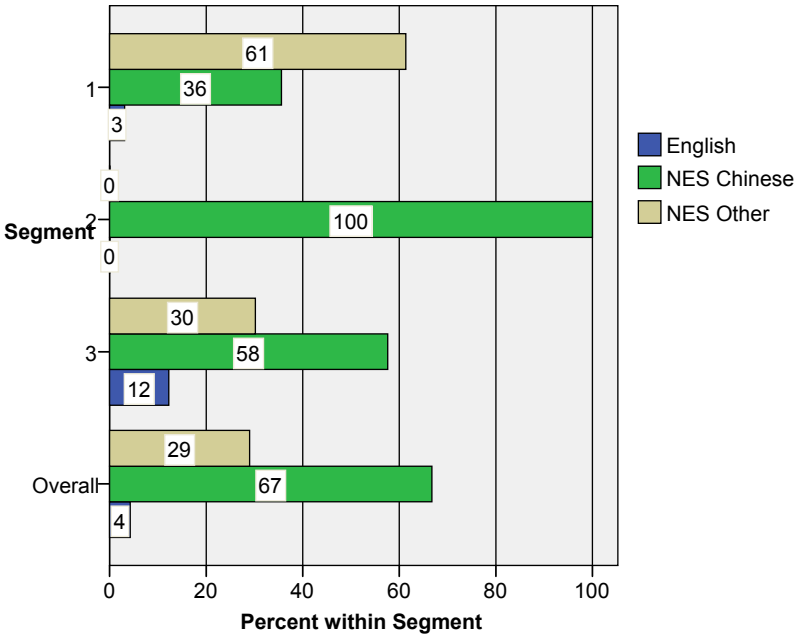
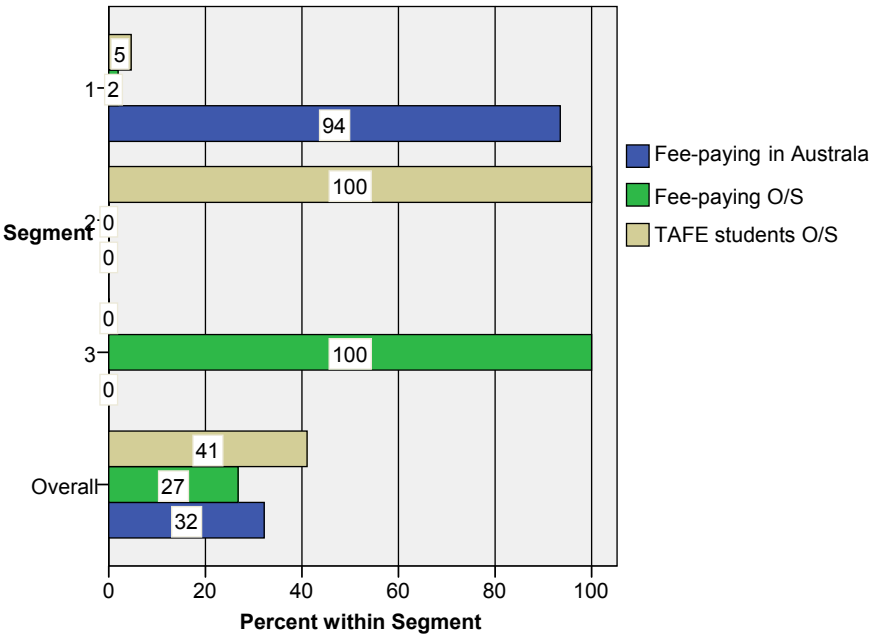


Figure 23: International Students, Within Segment Percentage of Course Location, 2007



4 STUDENT PROGRESSION ANALYSIS

4.1 RECENT LITERATURE ON PROGRESSION AND ATTRITION

There is an extensive literature on the determinants of student progression and attrition. Cao and Gabb (2006) have undertaken an important study of the determinants of attrition among higher education students at Victoria University for the years 2002-04. These authors provide a review of the literature on determinants of attrition, and an extract from the review is reproduced in Excerpt 1.

Excerpt 1: Factors Influencing Student Attrition

Socio-demographic variables related to student attrition include gender, age, language, geographic location, socio-economic status and country of birth. For example, there are reports that females are more likely than males to complete a course (e.g. Martin, Maclachlan and Karmel 2001) but a recent study of Australian first year university students (Long, Ferrier and Heagney, 2006) indicated that gender differences in first year attrition rate were tiny. A number of studies (DEST 2004; Martin, Maclachlan and Karmel 2001) suggest that students aged between 17 and 20 have much lower attrition rates than older students. Language background has also been studied, with a study that was part of the Longitudinal Surveys of Australian Youth (LSAY), concluding that students from a language background other than English had a much lower attrition rate than that of English background students (McMillan 2005). With respect to geographic location, it has been reported that students from urban areas had a higher completion rate than students from isolated areas (James et al. 2004) and students from capital cities had a lower attrition rate than students from provincial cities (McMillan 2005). James et al. (2004) concluded that higher SES students had lower attrition rates than lower SES students (James et al. 2004), although another study suggested that the association between completion rate and family wealth was not consistent across different groups of students (Carpenter, Hayden and Long 1998). In terms of the country of birth, a UK study (Johnes and McNabb 2004) concluded that domestic students were more likely to withdraw than international students, while Australian data suggests a different pattern (DEST 2004).

Australian studies have shown that prior academic achievement, as measured by Equivalent National Tertiary Entry Ranking (ENTER) scores and other standard indexes, is negatively related to attrition. For example, the LSAY study discussed above found an attrition rate from higher education of 5% for those with ENTER scores of 90 or more compared with a rate of 23% for those with ENTER scores of less than 70 (McMillan 2005). Similarly, a US study suggested that a one standard unit increase in high school GPA was associated with a 2% increase in student persistence (Titus 2004). A UK study (Johnes and McNabb 2004) found that school type also contributed significantly to student attrition, although this was not the case in the LSAY study (McMillan 2005).

Variables associated with institutional experience, such as broad field of study, basis for admission, type of attendance and employment status were all found to be related to student attrition. For example, Martin et al. (2001) found that veterinary science and health students had higher completion rates than students from other fields, while adult students across fields of study had an attrition rate of 21%.

The effect of type of attendance (full-time versus part-time) has also been studied, with most reports concluding that those who study part-time are more likely to leave their courses than those who study full-time (Krause et al. 2005; Hillman 2005). However, the LSAY study based on the 1995 Year 9 cohort found no significant difference in attrition rate between full-time and part-time students (McMillan 2005).

Academic performance has consistently been identified as a predictor of attrition. For example, a US study indicated that the probability of persistence increased by 8% with an increase in of one unit in first year GPA (Titus 2004). Employment while studying has also been explored with mixed results. McMillan's (2005) LSAY study concluded that students who worked 21 or more hours a week were much more likely to leave than students who were not working. However, a recent study (Bradley 2006) reported that students who did not work and students who worked over 21 hours a week were both more likely than other groups of students to continue their studies.

Source: Extract from Cao and Gabb (2006, pp. 2-3).

Cao and Gabb (2006) point out that the literature cites a wide range of factors influencing student attrition, such as gender, age, language, location, socio-economic status and country of birth. They also note that different studies find quite different effects, and in some cases the findings are counter-intuitive. Some studies show that prior academic and institutional experience are important factors in attrition, and that the type of attendance and the nature of engagement with education and work can also be important.

The measure of progression used here is related to that of attrition, however we examine the factors cited above as potential determinants of student progression.

4.2 DATA, MEASURES AND METHODOLOGY

This section describes the methodology employed in the empirical analysis, the results of which are reported below. We use the *progress rate* as a measure of academic performance, for it permits multivariate regression analysis at the individual student level. For students in higher education, the progress rate is defined as the proportion of assessed student load passed by the student and is calculated as passed load over assessed load (both in Equivalent Full-Time Student Load, EFTSL). For TAFE or VET students, the equivalent to the progress rate is the Modular Load Completion Rate (MLCR) based on student contact hours (SCH). More precisely, we calculated MLCR for TAFE students as the ratio of completed SCH to counted SCH. We use this as a proxy for the progress rate, although analysis of progress rates is undertaken separately for higher education and TAFE students.

Of the 38904 valid observations in 2007, the progress rate was zero in 6059 (15.6%) cases, one in 32811 (84.3%) cases, with only 34 cases having an intermediate value, i.e. between 0 and 1. Given the bimodal distribution of the variable, we created an indicator variable, ProgRate, that took the value of one if progress rate was one and the value of zero if progress rate was smaller than one. Hence, our analysis estimates the probability of 100% success rate in academic progress.

To reveal the probability of success in academic progress we employ a Generalised Least Squares (GLS) Probit Maximum Likelihood Estimator. The model allows the dependent variable to have a non-normal distribution and is robust to heteroskedasticity. The Davidon-Fletcher-Powell (DFP) algorithm was used to maximise the likelihood function and estimate the parameters in STATA 10.

4.3 EMPIRICAL RESULTS: HIGHER EDUCATION STUDENTS

Table 12 presents the estimation results for higher education students in 2007. For all Australian students the following factors showed a statistically significant impact on progression rates:

- *gender*: females student tended to have higher progression rates than male students;
- *age*: there is a significant positive influence of age on progression;
- *full-time study*: full-time students tended to have higher progression rates than part-time students;
- *socio-economic status*: there was a strong positive link between socio-economic status (as measured by the SEIFA Economic Resources Index) and progression rates;
- *membership of segment 2*: students in segment 2 had a higher progression rate than those in the other segments;
- *full-time work*: there was a positive association between working full-time and the progression rate;
- *language spoken at home*: students for which English was spoken at home tended to have a higher progression rate than other students; and
- *differences between major course types*: progression rates in health are higher than in the student population as a whole, and substantially lower in engineering and science studies.

Surprisingly, a number of other reviewed variables had no significant effect. For example, none of the variables relating to the place of birth of the parents had a significant effect on progression, and neither did the 'not in employment' variable or the western region variable. The coefficients on the course type variables suggest that there are continuing problems in student performance in science and engineering. The four course type variables used here are not exhaustive, and all other courses are treated as the reference group.

The results suggest that, in addition to age, gender, full-time study and full-time work, key socio-economic variables (socio-economic status and language spoken at home) had a strong positive influence on progression of Australian higher education students. It is notable that, for higher education students, membership of Segment 2, the most disadvantaged group of students, also had a positive effect. This suggests that factors such as experience and determination to succeed, combined with appropriate University programs, had a positive influence on their progress.

The results for international students (Table 12, Column 2), are similar to those for Australian students with respect to age, gender, full-time studies and health studies. However, international engineering and business students also seem to perform relatively better.

Table 12: VU Progress Rates 2007, Higher Education Students

VARIABLE	AUSTRALIAN STUDENTS		INTERNATIONAL STUDENTS	
Intercept	-0.173	(0.201)	0.447	(0.195)
Age	0.008	(0.002)**	0.020	(0.006)**
Male	-0.147	(0.029)**	-0.373	(0.049)**
Full-time Employee	0.098	(0.047)*		
Not in Employment	-0.035	(0.032)		
Full-time Studies	0.359	(0.075)**	0.210	(0.068)**
SEIFA: Socio-economic Advantage	0.061	(0.017)**		
Segment 2: Disadvantaged	0.257	(0.077)**		
Segment 3: Working	0.187	(0.081)*		
Western Region	-0.014	(0.029)		
Engineering Studies	-0.341	(0.055)**	0.416	(0.152)**
Health Studies	0.491	(0.054)**	1.241	(0.289)**
Business Studies	-0.059	(0.034)	0.364	(0.085)**
Science Studies	-0.279	(0.061)**	0.134	(0.119)
LOTE: Speaks only English	0.145	(0.045)**		
Parents: Both Born Overseas	-0.036	(0.049)		
OBSERVATIONS	**11730**		**252**	

* Coefficients significant at 5% level. ** Coefficients significant at 1% level.
Notes: Standard errors in parentheses. Due to space limitations, father's and mother's place of birth were also included but are not reported; these were not statistically significant in most cases but are available on request.

4.3.1 HIGHER EDUCATION STUDENTS BY DOMAIN

Victoria University has mapped its courses into three main domains and twelve course clusters. The three domains are *Information and Infrastructure*, *Community Wellbeing* and *Business and Enterprise*. The first consists of the following three clusters: Engineering and Infrastructure, Information and Communication Technology and Transport and Logistics. The second domain contains five clusters, Health, Human Services, Sports and Recreation, Cultural and Creative Industries and Education and Transition. Finally, the third domain contains four clusters, Tourism and Hospitality, Financial and Economic Services, Law and Legal Services and Marketing Services. The distribution of students in 2007 across these domains and across the three segments identified earlier in this paper is provided in Table 13.

The students were allocated into these three domains and the Probit analysis was carried out for each of the domains. The results are presented, for higher education and TAFE students separately, in Table 14. It should be noted that relationships in the entire student population may not hold at the domain level, given the systematic differences between students in the different domains.

Table 13: VU Students by Course Domain and Segment

VU COURSE DOMAIN	AUSTRALIAN SEGMENT 1		AUSTRALIAN SEGMENT 2		AUSTRALIAN SEGMENT 3		INTERNATIONAL TOTAL	
	HIGHER EDUCATION SECTOR							
	Count	%	Count	%	Count	%	Count	%
Information & Infrastructure	915	10	452	18	168	9	665	12
Community Wellbeing	4,863	55	871	36	1,103	58	654	12
Business & Enterprise	3,025	34	1,129	46	628	33	4044	75
TOTAL	**8803**		**2452**		**1899**		**5363**	
	TAFE SECTOR							
	Count	%	Count	%	Count	%	Count	%
Information & Infrastructure	26	14	3,016	36	3,096	41	212	5
Community Wellbeing	138	75	4,344	51	3,634	48	2880	63
Business & Enterprise	20	11	1,115	13	886	12	1451	32
TOTAL	**184**		**8475**		**7616**		**4543**	

As shown in Table 14, there are some important differences between higher education students in the different domains, in particular for students in the information and infrastructure domain relative to other students. The role of age and gender is evident in all three domains, except that there is no better performance by females in the information and infrastructure domain. In business and enterprise there is a strong positive effect from working full-time but not from studying full-time, but these effects are reversed for the other two domains. Similar differences occur in the role of other variables in influencing progression rates. For example the effect of socio-economic status is most pronounced in the community well-being domain, while the positive effect of being a member of segment 2 is concentrated in information and infrastructure and that of speaking English is concentrated in business and law.

It is to be expected that the determinants of the progression rate would vary across domains and course types, as different courses make different demands (e.g. access to English language literature as opposed to technical material) and will be best supported by different family backgrounds. Nevertheless the results reported here are preliminary, and deserve more detailed investigation.

Table 14: VU Progress Rates 2007, Australian Higher Education Students by Domain

VARIABLE	INFORMATION & INFRASTRUCTURE		COMMUNITY WELLBEING		BUSINESS & ENTERPRISE	
Intercept	-0.830	(0.525)	-0.106	(0.299)	-0.494	(0.330)
Age	0.021	(0.007)**	0.008	(0.003)**	0.012	(0.004)**
Male	-0.205	(0.112)	-0.109	(0.044)*	-0.174	(0.045)**
Full-time Employee	0.179	(0.133)	-0.005	(0.067)	0.117	(0.074)
Not in Employment	-0.015	(0.083)	-0.089	(0.047)	0.010	(0.051)
Full-time Studies	0.607	(0.171)**	0.462	(0.109)**	0.301	(0.134)*
SEIFA: Socio-economic Advantage	0.053	(0.043)	0.070	(0.025)**	0.063	(0.027)*
Segment 2: Disadvantaged	0.508	(0.164)**	0.056	(0.120)	0.353	(0.138)**
Segment 3: Working	0.326	(0.211)	0.056	(0.105)	0.545	(0.159)**
Western Region	-0.174	(0.077)*	0.029	(0.042)	-0.015	(0.047)
LOTE: Speaks only English	0.147	(0.117)	0.026	(0.067)	0.218	(0.073)**
Parents: Both Born Overseas	0.060	(0.137)	-0.027	(0.070)	0.005	(0.082)
OBSERVATIONS	**1349**		**6183**		**4125**	

* Coefficients significant at 5% level. ** Coefficients significant at 1% level.
Notes: Standard errors in parentheses. Due to space limitations, father's and mother's place of birth were also included but are not reported; only the indicator variables of 'Father: born in China/SAR' and 'Father: born in other Asian countries' had negative and statistically significant coefficients in the first column.

4.3.2 HIGHER EDUCATION STUDENTS BY ACADEMIC EXPERIENCE

We cited earlier Gabb, Milne and Cao (2006) who emphasised the role of first year of academic experience as key to student attrition and progress. We have, thus, divided the higher education student body for 2007 into those in the first two years at the University and those in later years, and undertaken the Probit analysis for these two groups. The results are reported in Table 15. As expected, there are significant differences between the factors influencing progression for early students and for those who have been at the University for some time. In particular, while age and gender influence progression in the first two years, they have little effect subsequently. Full-time study remains important for both groups, but speaking English at home is important only for early students while the socio-economic effect is significant only for continuing students. These differences also require further study.

Table 15: VU Progress Rates 2007, Australian Higher Education Students by Experience

VARIABLE	IN FIRST YEAR		AFTER FIRST YEAR	
Intercept	0.213	(0.345)	-0.384	(0.253)
Age	0.009	(0.005)	0.004	(0.002)
Male	-0.139	(0.050)**	-0.145	(0.037)**
Full-time Employee	0.071	(0.088)	0.105	(0.057)
Not in Employment	-0.019	(0.051)	-0.020	(0.041)
Full-time Studies	0.367	(0.156)*	0.437	(0.088)**
SEIFA: Socio-economic Advantage	0.008	(0.028)	0.093	(0.022)**
Segment 2: Disadvantaged	0.204	(0.154)	0.247	(0.092)**
Segment 3: Working	0.061	(0.159)	0.212	(0.096)*
Western Region	0.022	(0.048)	-0.028	(0.037)
Engineering Studies	-0.583	(0.091)**	-0.208	(0.070)**
Health Studies	0.620	(0.089)**	0.419	(0.068)**
Business Studies	-0.298	(0.056)**	0.095	(0.044)*
Science Studies	-0.348	(0.101)**	-0.237	(0.077)**
LOTE: Speaks only English	0.188	(0.080)*	0.134	(0.055)*
Parents: Both Born Overseas	-0.051	(0.084)	-0.022	(0.062)
OBSERVATIONS	**3842**		**7888**	

* Coefficients significant at 5% level. ** Coefficients significant at 1% level.

Notes: Standard errors in parentheses. Due to space limitations, father's and mother's place of birth were also included but are not reported; only the indicator variable of 'Father: born in China/SAR' had a negative and statistically significant coefficient in the second column.

4.3.3 HIGHER EDUCATION STUDENTS BY CALD

The significance of factors such as socio-economic status (SES), non-English speaking background (NESB) and cultural diversity in explaining progress rates raises the possibility that SES as measured by the SEIFA index masks the effect of a culturally and linguistically diverse (CALD) population on progress rates. Thus, we seek to examine the SES effect (i.e. SEIFA score) on the progress rate when we control for CALD as an independent factor, as well as when we account for the interaction between SES and CALD.

We define CALD for two generations of Australians using four binary/indicator variables. The first measure, CALD: 1st Generation NES, takes the value of one when the student was born overseas in an non-English-speaking (NES) country *and* the student speaks a language other than English (LOTE) at home, and equals zero otherwise. The second, CALD: 2nd Generation NES, takes the value of one if the student was born in Australia, at least one of the parents was born overseas in a NES country *and* the student had a LOTE at home, and equals zero otherwise. The third, CALD: 1st Generation ES, is the English-speaking equivalent of the first measure while the fourth, CALD: 2nd Generation ES, is the English-speaking equivalent of the second measure.[6]

[6] In higher education, there were 3278 (20.7%) students who belonged to the first measure of CALD, 3033 (19.2%) students in the second CALD group, 437 (2.8%) students in the third category, and 3280 (20.7) students in the fourth. The corresponding figures in the TAFE sector were 6124 (24.6%), 4760 (19.1%), 729 (2.9%) and 5028 (20.2%), respectively.

Table 16 presents the GLS Probit results using the above four measures of CALD as explanatory variables. In all three columns, we find that generational and CALD effects are important. That is, being a 1st generation Australian student reduces the chances of academic progression. Surprisingly, being born in Australia with a 2nd generation CALD background also associates with weaker performance. On the other hand, 1st and 2nd generation students who speak English as the main language at home do not seem to be disadvantaged. It is important also to note that even with these CALD variables included, the SES variable remains significant at the 1% level – a socio-economic effect on progression numbers remains even after controlling for CALD. Interaction effects between SES and CALD are reported in Table 21 below.

Table 16: VU Progress Rates 2007, Australian Higher Education Students, CALD

VARIABLE	ALL STUDENTS		IN FIRST YEAR		AFTER FIRST YEAR	
Intercept	-0.011	(0.199)	0.462	(0.347)	-0.252	(0.248)
Age	0.008	(0.002)**	0.010	(0.005)*	0.004	(0.002)
Male	-0.147	(0.029)**	-0.142	(0.049)**	-0.144	(0.037)**
Full-time Employee	0.096	(0.047)*	0.078	(0.088)	0.097	(0.056)
Not in Employment	-0.038	(0.032)	-0.009	(0.051)	-0.026	(0.041)
Full-time Studies	0.352	(0.075)**	0.346	(0.155)*	0.418	(0.087)**
SEIFA: Socio-economic Advantage	0.060	(0.017)**	0.004	(0.028)	0.096	(0.021)**
Segment 2: Disadvantaged	0.249	(0.076)**	0.192	(0.152)	0.219	(0.091)*
Segment 3: Working	0.182	(0.081)*	0.027	(0.158)	0.205	(0.095)*
Western Region	-0.012	(0.029)	0.020	(0.048)	-0.023	(0.037)
Engineering Studies	-0.336	(0.055)**	-0.561	(0.091)**	-0.215	(0.070)**
Health Studies	0.492	(0.054)**	0.632	(0.089)**	0.415	(0.068)**
Business Studies	-0.058	(0.034)	-0.281	(0.056)**	0.081	(0.044)
Science Studies	-0.279	(0.061)**	-0.342	(0.101)**	-0.242	(0.077)**
CALD: 1st Generation NES	-0.247	(0.046)**	-0.324	(0.074)**	-0.230	(0.060)**
CALD: 2nd Generation NES	-0.171	(0.042)**	-0.163	(0.067)*	-0.180	(0.056)**
CALD: 1st Generation ES	-0.036	(0.094)	-0.214	(0.165)	0.041	(0.117)
CALD: 2nd Generation ES	-0.037	(0.040)	-0.054	(0.066)	-0.037	(0.052)
OBSERVATIONS	**11730**		**3842**		**7888**	

* Coefficients significant at 5% level. ** Coefficients significant at 1% level.
Notes: Standard errors in parentheses.

Table 17 repeats the exercise by splitting the Australian higher education sample by domain. Again, the results are similar except that the disadvantage associated with the 1st generation students with CALD background is more prevalent but the 2nd generation 'business and enterprise' students of CALD background are also more likely to faces challenges with respect to progression.

Table 17: VU Progress Rates 2007, Australian Higher Education Students by Domain, CALD

VARIABLE	INFORMATION & INFRASTRUCTURE		COMMUNITY WELLBEING		BUSINESS & ENTERPRISE	
Intercept	-0.526	(0.515)	-0.081	(0.297)	-0.318	(0.327)
Age	0.022	(0.007)**	0.008	(0.003)**	0.011	(0.004)**
Male	-0.201	(0.112)	-0.111	(0.043)**	-0.175	(0.045)**
Full-time Employee	0.158	(0.130)	-0.009	(0.067)	0.122	(0.074)
Not in Employment	-0.036	(0.083)	-0.088	(0.047)	0.014	(0.051)
Full-time Studies	0.598	(0.168)**	0.461	(0.109)**	0.310	(0.134)*
SEIFA: Socio-economic Advantage	0.041	(0.042)	0.071	(0.025)**	0.064	(0.027)*
Segment 2: Disadvantaged	0.518	(0.160)**	0.063	(0.118)	0.354	(0.137)**
Segment 3: Working	0.297	(0.208)	0.048	(0.105)	0.574	(0.158)**
Western Region	-0.185	(0.077)*	0.034	(0.042)	-0.011	(0.046)
CALD: 1st Generation NES	-0.305	(0.118)**	-0.206	(0.071)**	-0.106	(0.073)
CALD: 2nd Generation NES	-0.124	(0.121)	-0.043	(0.065)	-0.155	(0.068)*
CALD: 1st Generation ES	-0.026	(0.225)	-0.155	(0.146)	0.172	(0.149)
CALD: 2nd Generation ES	-0.094	(0.124)	-0.054	(0.053)	0.095	(0.073)
OBSERVATIONS	**1349**		**6183**		**4125**	

* Coefficients significant at 5% level. ** Coefficients significant at 1% level.
Notes: Standard errors in parentheses.

4.4 EMPIRICAL RESULTS: TAFE STUDENTS

For Australian TAFE students, many of the results for higher education students remain, but there are some variations (see Table 18). For the *demographic* variables, progression rates are again positively and strongly influenced by age, but there is no gender effect. The *engagement effect* is even more pronounced, with strong positive links between progression rates and both full-time study and full-time work, but also a significant negative association with not being in employment. For TAFE students, being actively engaged in full-time work and/or full-time study has a positive effect on progression, whereas not being in any employment has a negative effect.

Socio-economic and family background effects remain strong, but are somewhat different than for higher education students. The positive effects of higher economic resources (SEIFA 2) remain significant at the 1% level, but the English language effect is only marginally significant. However, for these students parents background is highly significant, with a strong positive effect from having both parents born overseas, but a strong negative effect from having a father born in Africa. It may be that parents born overseas give strong impetus to the child's progress in the TAFE area, and that in this area lower English language capability at home is less of a liability in terms of student performance. The results also suggest that TAFE students with African backgrounds may be experiencing special problems.

By contrast with the higher education case, being a *member of segment 2* has a strong negative effect on progression for TAFE students, but here there is a strong positive effect from coming from a family based in the western region of Melbourne. There may be a case for further attention to the needs of TAFE students in segment 2, but the results do suggest that students from the West are, ceteris paribus, doing better than other students in TAFE.

Table 18: VU Progress Rates 2007, TAFE Students, GLS Probit

VARIABLE	AUSTRALIAN STUDENTS		INTERNATIONAL STUDENTS	
Intercept	-0.216	(0.192)	2.204	(0.244)
Age	0.006	(0.001)**	-0.001	(0.009)
Male	0.039	(0.027)	-0.685	(0.109)**
Full-time Employee	0.183	(0.036)**		
Not in Employment	-0.119	(0.032)**		
Full-time Studies	0.111	(0.035)**	-0.140	(0.165)
SEIFA: Socio-economic Advantage	0.108	(0.015)**		
Segment 2: Disadvantaged	-0.394	(0.107)**		
Segment 3: Working	-0.278	(0.100)**		
Western Region	0.114	(0.031)**		
Engineering Studies	-0.179	(0.049)**		
Health Studies	0.324	(0.074)**	0.614	(0.293)*
Business Studies	0.108	(0.045)*	-1.477	(0.699)*
Science Studies	0.748	(0.077)**	0.039	(0.113)
LOTE: Speaks only English	0.070	(0.040)	-0.881	(0.323)**
Parents: Both Born Overseas	0.194	(0.079)*		
OBSERVATIONS	**14673**		**92**	

* Coefficients significant at 5% level. ** Coefficients significant at 1% level.
Notes: Standard errors in parentheses. Due to space limitations, father's and mother's place of birth were also included but are not reported; only the indicator variable of 'Father: born in Africa' had a negative and highly statistically significant coefficient in the first column.

4.4.1 TAFE STUDENTS BY DOMAIN

Again there are differences between results for the different domains and the aggregate results (see Table 19), with a number of factors influencing progression rates for all TAFE students having an effect in only one or two domains. This is true of the impact of age, full-time employment, full-time study and, to a lesser extent, socio-economic status. It is also notable that there is a strong positive impact of being located in the West for the first two domains, but a strong negative effect for the business and enterprise domain.

Table 19: VU Progress Rates 2007, Australian TAFE Students by Domain

VARIABLE	INFORMATION & INFRASTRUCTURE		COMMUNITY WELLBEING		BUSINESS & ENTERPRISE	
Intercept	-1.396	(0.365)	0.095	(0.267)	0.936	(0.527)
Age	0.001	(0.002)	0.006	(0.001)**	0.015	(0.004)**
Male	0.040	(0.062)	0.055	(0.038)	0.022	(0.074)
Full-time Employee	0.055	(0.060)	0.232	(0.057)**	0.139	(0.104)
Not in Employment	-0.143	(0.059)*	-0.129	(0.043)**	-0.181	(0.085)*
Full-time Studies	0.165	(0.075)*	0.005	(0.044)	0.528	(0.123)**
SEIFA: Socio-economic Advantage	0.157	(0.026)**	0.081	(0.021)**	0.067	(0.044)
Segment 2: Disadvantaged	0.483	(0.251)	-0.413	(0.144)**	-0.607	(0.278)*
Segment 3: Working	0.532	(0.244)**	-0.260	(0.138)	-0.651	(0.263)*
Western Region	0.202	(0.054)**	0.124	(0.042)**	-0.388	(0.096)**
LOTE: Speaks only English	0.125	(0.060)*	0.033	(0.061)	0.012	(0.118)
Parents: Both Born Overseas	0.107	(0.152)	0.230	(0.102)*	-0.040	(0.226)
OBSERVATIONS	**5574**		**7018**		**2076**	

* Coefficients significant at 5% level. ** Coefficients significant at 1% level.
Notes: Standard errors in parentheses. Due to space limitations, father's and mother's place of birth were also included but are not reported; only the indicator variable of 'Father: born in Africa' had a negative and highly statistically significant coefficient in columns 1-2.

4.4.2 TAFE STUDENTS BY CALD AND INTERACTION EFFECTS

Finally, we extend our analysis of CALD by considering the interaction of SES, CALD and generational effects. We decompose SEIFA into three variables. The first is identical to SEIFA if the student has a *CALD: 1st Generation NES* background and zero otherwise, the second is equal to SEIFA if the student has a *CALD: 2nd Generation NES* background and zero otherwise, and the third is equal to SEIFA if the student does not belong to either *CALD: 1st Generation NES* or *CALD: 2nd Generation NES* groups.

The results show that in higher education, *CALD: 1st Generation NES* students perform worse than third generation Australians on average (i.e. a negative coefficient for 'CALD: 1st Generation NES') but their performance improves much more than other students when their SES improves (i.e. 'SEIFA: Socio-economic Advantage – CALD 1st Generation NES' has a positive and much higher coefficient than 'SEIFA: Socio-economic Advantage – CALD 2nd Generation NES' or 'SEIFA: Socio-economic Advantage – Third Generation or ES') (see tables 20 and 21).

An interaction between SES and CALD is also observed amongst TAFE students. However, there are three main differences with higher education students. First, the 'CALD 1st Generation NES' group is not disadvantaged on average but their progress rate seems lower than that of others when their SEIFA score improves. Second, it is now the 'CALD 2nd Generation NES' group that is disadvantaged as a group but their performance improves with SEIFA more than that of others. Third, we find that students of 1st Generation English-speaking CALD background are also at a disadvantage with respect to progression.[7]

[7] A Wald test confirms that the coefficient differences with respect to the three SEIFA groups are statistically significant at 5% level.

Table 20: VU Progress Rates 2007, Australian TAFE Students, CALD

VARIABLE	INFORMATION & INFRASTRUCTURE		COMMUNITY WELLBEING		BUSINESS & ENTERPRISE	
Intercept	-1.380	(0.362)	0.175	(0.262)	1.077	(0.515)
Age	0.001	(0.002	0.008	(0.002)**	0.017	(0.004)**
Male	0.027	(0.062	0.049	(0.038)	0.030	(0.075)
Full-time Employee	0.052	(0.060	0.232	(0.057)**	0.141	(0.104)
Not in Employment	-0.154	(0.059)**	-0.143	(0.043)**	-0.193	(0.085)*
Full-time Studies	0.164	(0.076)*	0.014	(0.045)	0.531	(0.124)**
SEIFA: Socio-economic Advantage	0.160	(0.026)**	0.083	(0.021)**	0.053	(0.043)
Segment 2: Disadvantaged	0.498	(0.237)*	-0.288	(0.141)*	-0.587	(0.258)*
Segment 3: Working	0.561	(0.242)*	-0.366	(0.144)*	-0.639	(0.253)*
Western Region	0.214	(0.054)**	0.132	(0.041)**	-0.374	(0.097)**
CALD: 1st Generation NES	-0.164	(0.099)	-0.196	(0.090)*	-0.280	(0.165)
CALD: 2nd Generation NES	0.053	(0.097)	0.016	(0.092)	-0.001	(0.160)
CALD: 1st Generation ES	0.054	(0.143)	-0.237	(0.129)	0.148	(0.293)
CALD: 2nd Generation ES	0.106	(0.074)	-0.058	(0.068)	-0.117	(0.115)
Observations	5574		7018		2076	

* Coefficients significant at 5% level. ** Coefficients significant at 1% level.
Notes: Standard errors in parentheses.

Table 21: VU Progress Rates 2007, Australian Higher Education and TAFE Students, CALD

VARIABLE	HIGHER EDUCATION		TAFE	
Intercept	0.080	(0.055)	-0.448	(0.199)
Age	0.008	(0.003)*	0.007	(0.003)*
Male	-0.147	(0.046)**	0.036	(0.080)
Full-time Employee	0.095	(0.034)**	0.174	(0.010)**
Not in Employment	-0.038	(0.028)	-0.133	(0.004)**
Full-time Studies	0.352	(0.052)**	0.129	(0.017)**
SEIFA: Socio-economic Advantage – CALD 1st Generation NES	0.082	(0.017)**	0.067	(0.006)**
SEIFA: Socio-economic Advantage - CALD 2nd Generation NES	0.042	(0.023)	0.154	(0.011)**
SEIFA: Socio-economic Advantage – Third Generation or ES	0.051	(0.009)**	0.120	(0.022)**
Segment 2: Disadvantaged	0.248	(0.080)**	-0.109	(0.013)**
Segment 3: Working	0.182	(0.172)	-0.134	(0.008)**
Western Region	-0.012	(0.043)	0.129	(0.040)**
Engineering Studies	-0.337	(0.110)**	-0.160	(0.039)**
Health Studies	0.493	(0.060)**	0.314	(0.020)**
Business Studies	-0.058	(0.077)	0.108	(0.001)**
Science Studies	-0.277	(0.067)**	0.743	(0.041)**
CALD: 1st Generation NES	-0.543	(0.065)**	0.323	(0.176)
CALD: 2nd Generation NES	-0.087	(0.353)	-0.290	(0.087)**
CALD: 1st Generation ES	-0.038	0.083	-0.084	(0.031)**
CALD: 2nd Generation ES	-0.037	0.045	0.010	(0.009)
OBSERVATIONS	11730		14503	

* Coefficients significant at 5% level. ** Coefficients significant at 1% level.
Notes: Standard errors in parentheses.

REFERENCES

Bradley, G. 2006, Work participation and academic performance: A test of alternative propositions, Journal of Education and Work, 19, 481-501.

Cao, Z. and Gabb, R. 2006, Student attrition at a new generation university, Postcompulsory Education Centre, Victoria University, Melbourne.

Carpenter, P.G., Hayden, M. and Long, M. 1998, Social and economic influences on graduation rates from higher education in Australia, Higher Education, 35, 399-422.

DEST 2004, Higher education attrition rates 1994-2002: A brief overview, Research note no. 1, Department of Education Science and Training, Canberra, viewed 10 November 2006, <http://www.dest.gov.au/NR/rdonlyres/8A245011-4F59-4D99-9D97-A1AD89D0C669/1043/1.pdf>.

Gabb, R., Milne, L. and Cao, Z. 2006, Understanding attrition and improving transition: A review of the recent literature, Postcompulsory Education Centre, Victoria University, Melbourne.

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., Baldwin, G., Coates, H., Krause, K.L. and McInnis, C. 2004, Analysis of equity groups in higher education 1991-2002, Department of Education Science and Training, Canberra.

Johnes, G. and McNabb, R. 2004, Never give up on the good times: Student attrition in the UK, Oxford Bulletin of Economics and Statistics, 66(1), 23-47.

Krause, K.-L., Hartley, R., James, R. and McInnis, C. 2005, The first year experience in Australian universities: Findings from a decade of national studies, Department of Education Science and Training, Canberra.

Long, M., Ferrier, F. and Heagney, M. 2006, Stay, play or give away? Students continuing, changing, or leaving the university in the first year, Department of Education, Science and Training, Canberra, viewed 10 November 2006, <http://www.dest.gov.au/NR/rdonlyres/678FF919-3AD5-46C7-9F57-739841698A85/14398/final.pdf>.

Martin, Y.M., Maclachlan, M. and Karmel, T. 2001, Undergraduate completion rates: An update, Department of Education, Science and Training, Canberra, viewed 20 October 2006, <http://www.dest.gov.au/archive/highered/occpaper/01f/default.htm>.

McMillan, J. 2005, Course change and attrition from higher education, Australian Council for Educational Research, Camberwell.

Titus, M.A. 2004, An examination of the influence of institutional context on student persistence at 4-year colleges and universities: A multilevel approach, Research in Higher Education, 45(7), 673-699.

APPENDIX: ABS CENSUS 2006, SEIFA DEFINITIONS

(1) INDEX OF RELATIVE SOCIO-ECONOMIC ADVANTAGE

Note: this is the inverse of the following ABS measure:

INDEX OF RELATIVE SOCIO-ECONOMIC DISADVANTAGE

Included variables

- % occupied private dwellings with no internet connection
- % employed people classified as Labourers
- % people aged 15 years and over with no post-school qualifications
- % people with stated annual household equivalised income between $13,000 and $20,799 (approx. 2nd and 3rd deciles)
- % households renting from Government or Community organisation
- % people (in the labour force) unemployed
- % one parent families with dependent offspring only
- % households paying rent less than $120 per week (excluding $0 per week)
- % people aged under 70 who have a long-term health condition or disability and need assistance with core activities
- % occupied private dwellings with no car
- % people who identified themselves as being of Aboriginal and/or Torres Straight Islander origin
- % occupied private dwellings requiring one or more extra bedrooms (based on Canadian National Occupancy Standard)
- % people aged 15 years and over who are separated or divorced
- % employed people classified as Machinery Operators and Drivers
- % people aged 15 years and over who did not go to school
- % employed people classified as Low Skill Community and Personal Service Workers
- % people who do not speak English well

(2) INDEX OF ECONOMIC RESOURCES

Included Variables

- % people with stated annual household equivalised income between $13,000 and $20,799 (approximately 2nd and 3rd deciles)
- % one parent families with dependent offspring only
- % occupied private dwellings with no car
- % households renting from Government or Community organisation
- % households paying rent less than $120 per week (excluding $0 per week)
- % people aged 15 years and over who are unemployed
- % households who are lone person households
- % occupied private dwellings requiring one or more extra bedrooms (based on Canadian National Occupancy Standard)
- % households owning dwelling they occupy (without a mortgage)
- % dwellings with at least one person who is an owner of an unincorporated enterprise
- % households paying mortgage greater than $2,120 per month
- % households owning dwelling (with a mortgage)
- % households paying rent greater than $290 per week
- % people with stated annual household equivalised income greater than $52,000 (approximately 9th and 10th deciles)
- % occupied private dwellings with four or more bedrooms

(3) INDEX OF EDUCATION AND OCCUPATION

Included variables

- % people aged 15 years and over who left school at Year 11 or lower
- % people aged 15 years and over with no post-school qualifications
- % employed people who work in a Skill Level 5 occupation
- % employed people who work in a Skill Level 4 occupation
- % people (in the labour force) unemployed
- % people aged 15 years and over with a certificate qualification
- % people aged 15 years and over at university or other tertiary institution
- % people aged 15 years and over with an advanced diploma or diploma qualification
- % employed people who work in a Skill Level 1 occupation

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