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# Attrition in Information Systems Courses: strategies from a new generation university

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## Abstract

*The Commonwealth Government has changed many of the funding models to universities in recent years. Additional funds from the Commonwealth Government are now tied to measures such as student outcomes particularly in areas such as teaching and learning, attrition and student progress. This has meant that many universities have been forced to reassess the way they teach and interact with undergraduate students. Moreover, in this climate of considerable change in the higher education sector, many schools of Information Systems are experiencing even more hardship compared to schools in other disciplines. The downturn in the local demand for IS courses has been exacerbated by external factors such as declining enrolments from overseas markets and a downturn in the employment market. This paper reports on the analysis of enrolment trends, student attrition and progress amongst IS undergraduates over a five year period at a New Generation University. It also reports on the measures that have been undertaken both at the university level and at the IS school level to address issues that have arisen from that analysis. The findings of the research provides some insight into the problems facing schools of IS within universities in the current climate and possible measures that can be undertaken to improve student retention.*

## Keywords

Student Attrition, Student Retention, Student Progress,

## INTRODUCTION

Until recently, Australia has enjoyed a relatively stable, publicly funded and independent university sector. In contrast, the first decade of this century has seen major changes to the ways Australian universities are funded and managed. According to Tierney and McInnis (2001), Australian universities provide a good example of the problems facing public universities in an era of globalization. "A decade ago most institutions received over 90 percent of their funding from the federal government; today no university receives more than 50 percent from the federal government" (Tierney & McInnis, 2001).

Universities have sought a number of ways to increase revenue and reduce expenditure. On the revenue side, measures have included offering courses in other countries, attracting students onshore from overseas, and introducing full fees for local entry into a university course. On the expenditure side, many Australian universities now offer incentives for staff to leave early and, in some cases, forced redundancies have taken place. The result has been a significant change to the ways that universities operate. For students they now pay higher levels of HECS or full fees which has further changed the climate of university life. For academic staff, employment is less certain and is highly reliant upon student numbers in courses.

The Information Systems discipline has been significantly affected by these changes, more so than most other disciplines. Student numbers have declined in the Information Systems discipline over the last four years following the peak in 2000 to 2002. While there is anecdotal evidence that growth in available IT jobs is

improving this has not translated into undergraduate enrolments in recent years. In 2005, undergraduate IS enrolments at Australia universities had declined by as much as 40% while the international market for IS students was almost non-existent (DEST, 2006c; Lea, 2006).

The Australian Commonwealth Government has also changed the way that it provides its decreasing proportion of funds to universities. Commonwealth Government funding is often linked to factors that involve metrics of university performance in specific areas such as student outcomes. It is in the area of student outcomes that some universities have been able to gain additional funding through programs such as the Learning and Teaching Fund (DEST, 2006b).

One of the measures of student outcomes is the attrition rate, that is, the proportion of students who do not graduate or move onto the next year. In Australia, attrition rates have varied significantly across the sector and amongst student groups and it is a major aim of the Commonwealth Government to improve these rates in coming years (DEST, 2004a).

This paper reports on an analysis of enrolment trends amongst IS undergraduate students and their outcomes over a five year period at one Australian university. The paper also reports on measures that have been undertaken both at the university level and at the school level to address issues that have arisen from the analysis. The findings of the research provides some insight into the problems facing IS schools in the current climate and the possible measures that can be undertaken to improve student progress and retention.

## LITERATURE ON STUDENT ATTRITION AND PROGRESS

In studying the institutional attrition rates at Victoria University, the Postcompulsory Education Centre (Gabb, Milne, & Cao, 2006) conducted an extensive literature review on studies in attrition and found that, according to recent local and international research, the following factors centring around academic experience affect attrition:

- Prior academic achievement – research suggests that students with prior academic achievement (such as successfully completing prior education or obtaining high marks) show greater likelihood of completing tertiary studies (McMillan, 2005; Pascarella & Terenzini, 2005; Simpson, 2003).

- Course preferences – McMillan's (2005) research revealed that students who did not enrol in their first preference were more likely to change course than those who did, and this finding was also consistent with another study in Queensland (Queensland Studies Authority, 2004.).

- Student aspirations and course fit – Research in Australia has found that students are less likely to leave and have more commitment to their studies if they are able to articulate their reasons for enrolling and have good educational experiences with respect to these reasons. Conversely, students not liking a course or finding that the course did not meet their expectations was shown to be major contributors to attrition and course change. (Callan, 2005; Hillman, 2005; Krause, Hartley, James, & McInnis, 2005; Summers, 2003)

- Quality of teaching  - student perceptions of poor quality of teaching is shown to be a consistent factor in attrition studies both locally and internationally. A most commonly cited reason for students' changing from one institution to another is that the second institution provided "better quality education" (Hillman, 2005; Yorke, 1999).

Other areas such as socio-economic status and language background have been shown to affect attrition. Research showed that low-income students were less likely to complete a degree than the not-low-income students (Schuh, 2005). In comparing Non-English speaking background (NESB) students with English-speaking background students, NESB student may have lower student progress rates but also lower attrition rates (James, Baldwin, Coates, Krause, & McInnis, 2004).

It is only in recent years that the issue of attrition has become an important issue in Australian higher education institutions and this paper examines the factors that are impacting on attrition rates in the Australian context.

## FUNDING AUSTRALIAN UNIVERSITIES

Universities are now accountable to the Commonwealth Government through the Institution Assessment Framework (IAF). While universities are still funded using traditional metrics such as research and student load, the IAF includes additional metrics that were not previously incorporated in the Educational Profiles that were replaced in 2004. According the DEST (2004b) '… the IAF is founded on the responsibilities of the Commonwealth to ensure that the institutions it funds are sustainable and deliver the outputs for which they are funded, that their outcomes are of a high quality and that they comply with their legal obligations". Moreover, the IAF includes qualitative as well as quantitative data from universities and external sources thus providing for an across-the-board assessment of each institutions broad achievements. While universities had previously

collected some of the data in previous years it was often ad hoc and anecdotal. The new framework includes four areas all of which have impacted significantly on universities: Organisational Sustainability, Compliance, Achievements in Higher Education Provision, and Quality Outcomes. It is the latter two areas where substantial additional funding has been made available to universities and, for the first time in the history of university funding, these funds have been based on the quality of learning and teaching and student outcomes.

**Learning and Teaching Performance Fund**

Following a review of higher education in 2002 the Commonwealth Government established the Learning and Teaching Performance Fund (LTPF). A major finding of the review was that "… although teaching is recognised as a core activity of all higher education institutions, current Commonwealth funding, internal staff promotion practices and institutional prestige tend to reinforce the importance of research performance rather than teaching performance"(DEST, 2006a). The purpose of the LTPF was to reward excellence in learning and teaching and to ensure that teaching was seen as an important element of the responsibilities of the higher education sector.

The LTPF provided funding of $54.6 million in 2006, increasing to $83.5 million in 2007 and $113.8 in 2008. The LTPF provided funds to those institutions that best demonstrated a high commitment to learning and teaching.

Importantly, a number of measures were used for the determination of the distribution of Learning and Teaching Performance funds in 2006. The measures included the Graduate Destination Survey (GDS), Course Experience Questionnaire (CEQ), Student Attrition and Student Progress from 2004. Fourteen universities shared $54 million in additional funding for excellence or high achievement in teaching and learning in 2006 (DEST, 2006b). Victoria University was not one of those to receive funding and was ranked 19 out of 38 universities(DEST, 2006b).

## STUDENT ATTRITION, RETENTION AND PROGRESS

While both the CEQ and then GDS are important measures, student retention has been of major interest to universities possibly because it is an area over which universities perceive they can have some immediate impact. A study of Higher Education Attrition Rates from 1996 – 2004 in Australia (DEST, 2004a) found that:

- Rates in the first year after commencement of a course are around double that of those in the second year.

- School leavers commencing in undergraduate courses in 2002 had an attrition rate of 17.4% in 2002. This is compared with the overall rate for domestic commencing undergraduate students of 21.2%.

- The attrition rates for domestic students on the whole have remained relatively stable over the years

- Attrition rates for postgraduate students are generally higher than those for undergraduate students.

- Domestic students generally have a higher attrition rate than their international counterparts

- The attrition rate for international students has declined to a greater extent than that for domestic students over the period.

- Attrition rates vary considerably across institutions and student groups.

- School leavers commencing in undergraduate courses have a lower attrition rate than other undergraduate commencers

- Postgraduate students have a higher attrition rate than undergraduate students

In simple mathematical terms, attrition + retention + completion = 100%. The *crude* attrition rate is the rate of loss of students from a unit of study or subject, a year, a whole course, a sector, an institution, the higher education sector or the tertiary education system over a period of time, often one year. Moreover, attrition rates are measured for commencing students, continuing students and for postgraduate coursework. Student progress is a slightly more complex formula but represents the proportion of subject load passed by a student in a period of time, usually a year. To allow for differences between institutions of factors that impact on the student body the attrition rate is adjusted by Department of Education, Science and Training for the following factors to gain an *adjusted* attrition rate:

- Gender
- Language background
- Level of study
- Residency status
- Location (rural, isolated, metro)
- New to HE
- ENTER
- Unemployment rate in graduate's home area

- Age
- Indigenous status
- Field of education
- Disability status
- SES (parent education and occupation, economic resources)
- Basis for admission
- Size of institution

The impact of these factors can be quite significant. For example, a comparison can be made between Victoria University, a Melbourne outer-suburban New Generation University (NGU) with the University of Melbourne. The initial differences between the crude rates for student attrition and progress is substantially reduced when other factors are included to produce the adjusted rate (Table 1). The importance of this exercise is that it emphasises that attrition and student progress are not necessarily a problem faced only by NGUs.

|  | Crude | Adjusted |
|---|---|---|
| Student retention |  |  |
| Victoria University | 75.74 | 80.46 |
| University of Melbourne | 90.82 | 86.00 |
| Student progress |  |  |
| Victoria University | 81.99 | 87.34 |
| University of Melbourne | 93.20 | 87.04 |

Table 1: Crude and Adjusted Student Attrition Rates for Victoria University and the University of Melbourne

In 2005, as part of the process to determine the allocation of Learning and Teaching Performance Funds, universities were ranked on their *adjusted* attrition rate. The adjusted attrition rate ranged from 34% to 15% with the national average at marginally more that 20%. Victoria University was the sixth highest.

Attrition and progress rates are important in the development of broad university wide policies but it is also important to know the rates in each School and to determine if there were significant differences. It was when investigations were undertaken in the School of Information Systems at Victoria University that it was discovered that academic staff had little knowledge of attrition and progress rates in the School. Moreover, staff had little or no knowledge of how this compared to other non-IS schools within the university or to IS Schools at other universities. The remainder of this paper reports on research into attrition/progress rates in the School of Information Systems at Victoria University and the actions that have been undertaken to address the current situation.

## ATTRITION AND PROGRESS IN THE SCHOOL OF IS

In attempting to undertaken measures to counter the high attrition rate and assist with student progress, it became clear very quickly that there had been very little analysis of the IS student body at Victoria University. Thus the first stage of the research was to establish a statistical profile of the current student body in the School and to compare it to those of previous years.

### School of Information Systems Profile

Victoria University is located in the western suburbs of Melbourne and comprises a TAFE and Higher Education division. It was established in the early 1990s following the amalgamation of Footscray Institute of Technology and Western Institute. The School of Information Systems at Victoria University is part of the Faculty of Business and Law. Students can take a range of undergraduate and postgraduate courses. The main undergraduate course is the Bachelor of Business (Information Systems) where students complete eight business core subjects, eight IS related specialisation subjects and eight electives. The School has 28 academic staff who undertake research and teaching duties. The School has only 2 full-time women academic staff. In the main, a

lecturer will have teaching commitments (involving lectures and workshops) at both the undergraduate and postgraduate level.

**Undergraduate Student Profile**

Historically, the former institutions that made up Victoria University aimed to provide tertiary education for students from the western suburbs of Melbourne. The University still targets this area and approximately 60% of Victoria University students come from the western suburbs. Moreover, a similar percentage comes from migrant families where the student is often the first one in the family to undertake tertiary studies.

Another major factor of the student profile was that most students come via the TAFE sector. This percentage has grown over the years to a point where well over 90% of students come with either a one year Certificate IV or two year TAFE Diploma. The impact of this has been significant as the average number of subject exemptions has grown. As the IS specialisation is offered under a Business degree, students who have completed an IS diploma at TAFE do less IS specialisations subjects (for which they get exemptions) but they must still do business core subjects. The result is that the School of Information Systems has gradually had less subject contact with students in the 24 unit degree.

The analysis of data found that the average number of subject exemptions rose by an average of one subject per student from 2.4 subject in 2001 to 3.3 subjects in 2005. Moreover, in previous years a large percentage of students may have entered the degree from another discipline and hence they were give non-IS subject exemptions. In 2005 and 2006, the majority of student enrol having completed an Information Systems TAFE diploma and hence the majority of their exemptions are for IS higher education subjects.

In 2002 – 2004, the percentage of International students varied from 30 – 40%. In 2005, less that 20% of the student body were overseas students, with only 15 new international student enrolments this year. Nearly all of these were for combined degrees in such areas as International Trade.

**Attrition Rate**

Analysis of the data from the University revealed that the School of Information Systems had a similar attrition rate as other schools in the Faculty of Business and Law. The one exception was the School of Law that had a relatively low rate of 16%. However the analysis revealed that while other schools were improving their retention rate, the attrition rate of the School of Information Systems was deteriorating.

The analysis revealed that the attrition rate of 17% for 2004 to 2005 had grown to 18.8% for 2005 to 2006. Interestingly, the attrition rate of first year students dropped over the same period from 29% to 26% but the attrition rate for latter year students rose from 11% to 16%. A deeper analysis of those that left the course found that an increasing number of students withdrew from the course. There was also a growing trend for students to transfer to another course, that is, use the IS degree to gain entry to a Business degree and then transfer to another discipline.

## MEASURES UNDERTAKEN TO REDUCE ATTRITION

At the end of the first phase in mid 2005, staff in the School of Information Systems had a relatively accurate understanding of the undergraduate student body and how students within the School were progressing. This was the first time that such an analysis had been done in the School and distributed to staff. At the same time, the University introduced separate university-wide Student Assessment and Student Progress Policies. In 2006, all faculties were to adhere to these policies. The main changes brought about by the policies were:

- The introduction of common procedures for students who failed to meet specified academic progress targets

- A formative piece of assessment in each subject by week 5. Students who were *at risk* were reported to course co-ordinators and students were contacted.

- Compulsory supplementary assessment for students who obtained between 40 – 49% on the final mark

- Conceded passes for students who obtained 45% or above.

At the School level, it was recognised by course co-ordinators that something needed to be done to ensure that the small number of students that enrolled in 2006 would be engaged and tracked through the semester. A number of measures were undertaken:

- A Student Orientation survey and a follow up survey at the end of the semester. The analysis found aspects of student experiences that students liked and disliked. For example, weekly online tests and

group work were enjoyed by most students but most students disliked that their assignments did not include any positive comments

- The reworking of course maps. As most students enter with IS subject exemptions, it was discovered that students took a large number of core business subjects in the first and second semester. As a consequence, IS staff had little contact with students in the first year and a large proportion of students struggled in business core subjects

- The recording of each students existing progress onto suggested course maps. The analysis of this revealed that some students had skipped subjects, done subjects they were not suppose to have done, or in some cases were in the final year of the course with impossible loads to complete.

- Contact with students via phone on three occasions throughout the semester. A record of the calls was kept and updated each time. The activity enable the course co-ordinators to discover factors impacting on students that often were not revealed until just prior to or after the semester ended.

- Co-ordination tasks were divided up into specific areas of administration, Recognition of Prior Learning (RPL) and pastoral care. Prior to this each co-ordinator had undertaken each of these duties. Although this did not reduce the workload it did streamline it enabling each co-ordinator to gain expertise in one area.

- The move to a consistent eLearning platform in WebCT. This meant that students, at least in the first year, had a clear contact line to subject co-ordinators.

The measures have only been in operation for a semester and most of the assessment of the measures is based on the observations and experiences of course co-ordinators. Most of the contact students had with course co-ordinators in the past was reactive and been negative in nature. The focus of the new measures were to change that emphasis and to get students to appreciate that course co-ordinators were there to help not to punish.

## Outcomes and Discussion

McInnis (2003) observed that the priorities and demands of students is vastly different from the student of past years:

> *The new realities of the student experience largely concern change in priority students now give to their time at university. We have observed in Australia recently that students increasingly expect university to fit with their lives rather than vice versa. For academics from any generation, this is often perplexing and frustrating. The students appear to be less engaged with university generally and with study in particular… Undergraduate students now have many more choices about when, where and what they will study and how much commitment they need to make to university life.*

This statement highlights a number of issues concerning teaching and learning in undergraduate courses that was revealed in the experiences of programs introduced at the School of Information Systems at Victoria University.

The first set of issues involved academics themselves. Whilst students may have different expectations and come to a university with different cognitive skills, it was clear that some academic staff had trouble adjusting to the changed student environment. Many of the new measures were challenged by some academics in the School who believed that the problems rested with the students themselves and there was little that they could do to change attrition rates. Preliminary feedback indicates that there is a long way to go in getting some academics to accept that they need to engage with students in different ways.

While data is still relatively small and the analysis not complete, it was clearly evident that students reacted positively to the pro-active measures undertaken by course co-ordinators. This was evident by both the feedback comments and the actions of students who contacted staff. A number of observations and anecdotal reflections have been made. These are summarised as follows

*Factors that trigger attrition*

- Academic failure. Although this might seem to be more indicative of the other factors rather than being a trigger in itself

- Employment. Financial needs require them to take on fulltime work

- Lack of interest or motivation. For many students the Lecture-Tutorial style does not suit their cognitive style

- Perceived advantages at other universities such as closer to home or more subject credits offered by another university

- Content of subject material appropriate to female students. Moreover, measures to support for female students in the past have provided only limited success

*Factors that encourage students to stay*

- If they enjoy the IS subjects

- If academics engage them in the classroom

- If the work load was perceived to be easy to do

- If a student could see that an IS degree is a direct way to employment

- If a student finds what they learn as being *practical*

Students who do not do well often still keep trying and are reluctant to leave. It appears that no matter how badly a student performs they will keep enrolling in the degree until they are eventually excluded.

Students who do leave the degree voluntarily are those who find better opportunities at other universities or who find the teaching/learning style at our university do not match their learning style. The students in the latter category don't like being lectured at but prefer the *hands-on type* of learning in often available to them in TAFE course. It was also observed that those students have short attention spans. No matter what level of personal concern or service was offered to these students they still left. This matches what Tinto (2003)stated when he said

> *Those institutions which are committed to the education of their students and are willing to tell students when it is in their interests to leave are also the institutions that are more likely to have students who are committed to the institution. As a consequence, they will also retain more of their students to degree completion. Furthermore, those institutions that are committed to their students will very likely be those that fare better in the more limited academic marketplace of the future*

There is strong anecdotal evidence to suggest that it is a matter of *fit* and not a lack of concern or care that is the important factor. Students don't leave because academics leave them alone and don't follow them up. Rather they leave because they discover university learning is just not for them. In the recent review of the Bachelor of Business degree at Victoria University covering all discipline areas it was revealed that students want a greater emphasis placed on generic skills such as communication and management. Moreover, they are seeking broad knowledge and skills of business processes.

An important issue in attrition isn't trying to focus on a strategy of *keeping-in-touch-thus-keeping-students* but on maintaining a fit between IS study programs, students interests and their learning styles. What this implies is that a strategy for retention should focus on one or both of the following:

- Recruiting students who fit the way we deliver our study programs (and thus we focus on a target market and be selective in our recruitment), or,

- Re-design our study programs to fit the cohort of students we attract.

The fit could involve:

- Creating a sense of community. The classroom can be a place where people meet to discuss professional/employment issues. It may help students see the practical side of classroom-based learning by having a discussion on how each subject helps them in their career development. The recent review of the Bachelor of Business indicated that students are seeking a course with more emphasis on personal skills and business knowledge.

- A specialist course has been established for the Islamic community at one of the campuses for the first time this year. It has yet to be evaluated but it has provided an environment for one community group to work together and share ideas. The group is made up primarily of female students

- The proportion of female students in Information Systems has varied over the years but has traditionally been in the range of 20 to 30 percent. Moreover, some courses such as Information Systems/Multimedia attract more female students. Despite the efforts of many female academic leaders in the School over the years, female students face greater hurdles progressing through the Information Systems degree than their male counterparts. Part of the solution however may be to ensure that more than 2 of the 28 staff are female.

- Expanding the work-based learning concept. This would require students to actually have work experience (paid or voluntary) and structuring the learning of business-based concepts around their

work experience. The idea here is not that co-operative education (a year in industry) is an add-on and is equivalent to two subjects, but that each of (or at least most of) the subjects in the degree integrate work experience into classroom discussions, assessment tasks, and learning activities. Assignments in a systems analysis subject for example could involve students talking to a manager at their work place and asking questions about process inefficiencies or system inefficiencies. In this strategy the view of learning is more in the spirit of professional development rather than generic education. The current systems develops a *reverse* method – do the degree first and you'll get a job after – but instead establish a degree where the student gest a job, comes to university and we will help them learn more than if you just stayed at that job.

## CONCLUSION

While there is some evidence that the employment market for IS professionals is improving it may be some years before this is reflected in increased undergraduate numbers. Schools of Information Systems are now competing within a smaller market for graduates much smaller than the boom years of the late 1990s and early 2000s. Moreover, it is clear that it is now more difficult to recruit a student than it is to lose one. Yet the retention rate in most Australian universities is relatively high. Like other discipline areas, schools of Information Systems need to undertake measures to ensure that students are engaged and progress. This paper reports on early research on enrolment trends amongst IS undergraduate students and their outcomes over a five year period at a New Generation University. It reported on measures within a program that were undertaken to address the issue of attrition. The study found that proactive programs engage students and provide them with more support. Nevertheless, while improved engagement provides benefits, there is a need for a holistic approach to retention involving all staff. Moreover, courses and subjects need to be adapted to better fit the needs of today's student who are increasingly demanding more flexibility in the way subjects are taught.**REFERENCES**

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