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**At Risk Policy and Early Intervention Programs for Underperforming
Students: ensuring success?**

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At Risk Policy and Early Intervention Programs for Underperforming Students: ensuring success?

In attempting to aid student learning one university has increased its focus on poorly-performing students who are at risk of being excluded from the University. This University's at risk program is an intervention strategy that attempts to assist underperforming students identify problems and suggest remediation strategies before attrition.

The effectiveness of the at risk program is investigated across a population of at risk students from 2006 to 2010. Effectiveness is judged on the basis of outcomes in subsequent semesters where the University's preferred outcome is that these students are not identified as at risk again. Engagement with the at risk process is the mediating variable, and is deemed an important factor but not necessarily a successful one. However, the results indicate that effectiveness is not a linear process and additional factors may play a role, for example, the reasons why students are at risk and, therefore, the length of time required by students or administrators to address these reasons. Interestingly, the role of campus is significant, with at risk students in one location far more likely to be at risk again compared with the second location. This raises significant implications for management, including the allocation of resources and the timing of the pastoral program. Suggestions for future research include the refinement of the logit model to include additional academic variables, such as motivation and learning styles and student progression and grade point average (GPA).

Introduction

Over the past twenty years research on educational issues has highlighted a change from providing a teacher-controlled environment to a greater focus on learning and learning pathways. The learning environment is now less teacher-centred or content-oriented, instead becoming more student-centred and learning-focussed (e.g. Kember, 1997; Åkerlind, 2003; González, 2010). This increased emphasis on the role of students in learning processes brings many benefits for both teachers and students (Åkerlind, 2004) and the definition of good teaching has expanded beyond just the practice, context or teachers' role to include the students' role (Parpala and Lindblom-Ylänne, 2007), resulting in teachers changing the way they teach to incorporate how their students learn (Gilbert, 2000).

The University being studied has increased its focus on how its students learn through analysis of their performance, measured by academic grades achieved across subjects studied, as part of a process of aiding student learning journeys. Students whose academic progress is consistently poor are identified through the University's At Risk program in order to identify those underperforming students early and provide intervention and remediation strategies to help these students improve their academic performance and avoid expulsion.

Previous work on Attrition

Overall, the topic of attrition is important to higher education institutions. Past research has shown that the recruitment of new students is several times more expensive than the retention of existing students (for example, Pitts and Woodside, 1984). When investigating

attrition and student drop-out rates, attention is most commonly directed at either student or institutional characteristics or a blend of both. The most commonly studied student characteristics are socio-demographic factors (Araque, Roldán and Salguero, 2009; Belloc, Maruotti and Petrella, 2009) and grades, including those pre-university (D'Souza and Maheshwari, 2010). Institutional characteristics most commonly investigated are elements of the faculty or department (Soen and Davidovitch, 2003; Davidovitch, Soen and Iram, 2008; Araque et al., 2009).

Further, the issue of student attrition is a widespread problem for all universities (Davidovitch et al., 2008). For example, in Australia, attrition is serious in both domestic and international student cohorts; 20 percent of domestic students and 10 percent of international students do not proceed to their second year (Long, Ferrier and Heagney, 2006). Students who do not go on to complete their programs represent a waste of effort, resources and opportunities for universities (Pitkethly and Prosser, 2001) and a significant cost for both student and public administration (Pervin, 1966).

However, much of the past research considering students in difficulty has focussed on attrition rather than students who are at risk or of similar status before they exit their course of study. Therefore, little attention has been directed at students at risk of attrition, but not yet lost to their program (Dobele, Kopanidis, Gangemi, Thomas, Janssen and Blasche, 2012). This study seeks to fill that gap by investigating factors involved in poor student performance, before attrition.

Overview of University At Risk Processes:

The University which is the focus of this study is a member of the Australian Technology Network (ATN) and is based in an Australian capital city. The identity of the university and the specific department are withheld to ensure anonymity and are hereafter referred to as the University. This University offers multiple programs at multiple domestic and overseas venues. The study sample is drawn from the marketing and economics and finance programs offered at a Melbourne CBD location and in Singapore through a Singaporean partner organisation which administers the program on behalf of the University.

At this University the term “at risk” refers to a situation where a student is in danger of being excluded (expelled) from their university program (degree) due to continued unsatisfactory academic performance. Once at risk the student remains so until the end of their degree program; there are no grace periods or resets. If a student meets the at risk criteria a second time, they are considered at risk again and are required to show cause as to why they should not be excluded.

The Academic Progress Policy of the University requires that an Academic Progress Committee (APC) evaluates the performance of all enrolled students at the end of each semester and identifies those who should be classified as at risk, either first stage or again. Specific responsibilities of managing the at risk process are placed on departmental progress committees or project teams. The APC advises all at risk students of their status via email and these students are invited to participate in a non-compulsory, face-to-face interview with an academic advisor. During this interview an Academic Performance

Improvement Plan (APIP) is prepared with the student in order to improve their performance in subsequent semesters. Students are given the option of completing their part of the APIP via email. The APIP is divided into three main sections. First, the student's details and the name of the academic advisor are recorded. Second, students offer their reasons for their poor academic performance and identify their own strategies for improvement. Third, the academic advisor suggests actions or strategies for improvement, based on the student's responses. Students who attend an interview or submit a completed APIP form are deemed to have engaged in the University's at risk process.

Development of Research Questions

The focus of past research on attrition has provided several starting points for an investigation into at risk students and student characteristics, and the lessons learned in studying attrition are put to use in this study. For example, much of the research 'pertaining to ... behaviour has been consistent in showing two particular variables to be of relevance and importance, that of gender and age' (Kopanidis, 2008, p. 70).

Previous research has considered the impact of gender bias in preferences for degree programs (e.g. Worthington and Higgs, 2004; Krause, Hartley, James and McInnis, 2005; Goyette and Mullen, 2006) and that these differences are significant across different programs (e.g. Worthington and Higgs, 2004; Krause et al., 2005; Goyette and Mullen, 2006; Whitehead, Raffan and Deaney, 2006). Female students usually demonstrate more academic orientation, commitment and higher levels of satisfaction with their study than their male counterparts (Krause et al., 2005). Moreover, female students are more likely to indicate that their intrinsic interest in the subject area is an important motivating factor for

them (Krause et al., 2005) and to pursue higher education because of the academic challenges and enjoyment of the course, combined with a desire for independence (Whitehead et al., 2006).

These reasons may explain why women are slightly more likely than men to pursue higher education (Whitehead et al., 2006). However, male students are less likely to drop out of university than female students (Belloc et al., 2009). Consistent with this finding, the first research question of this study is phrased as follows: RQ1 male students are less likely to be at risk than female students.

While previous research has considered student age, there is no consensus on the importance of this characteristic in explaining student attrition. Typically, school leavers are defined as aged between 17-20 years, and students aged 21 plus years are classified as mature aged (Kopanidis, 2008). Age is important when selecting university programs or institutions (e.g. Dawes and Brown, 2002) but perhaps plays no role in the decision to withdraw from a course (e.g. Willging and Johnson, 2004).

Perhaps age should not be considered on its own, but rather as a function of the time between previous school studies, typically secondary, and the decision to undertake tertiary studies. For example, a greater period of time between finishing high school (or the equivalent) and taking up tertiary studies may increase the likelihood of failing to graduate (Tabnacknick and Fidell, 2007) or decrease the likelihood of a student dropping out (Belloc et al., 2009). There may be marked attitudinal and motivational differences across the age

groups that explain attrition. It is possible that mature aged students have set clear directional goals and are driven more by intrinsic motives (Krause et al., 2005) and are less likely to fail or drop out of their programs. Research question 2 is phrased as follows:

RQ2 School age students are more likely to be at risk than mature age students.

Ethnic or cultural identity may also explain student differences (Dawes and Brown, 2002). For example, country of birth appears to have a significant role in the selection of a university and the size of the choice set (number of institutions) under consideration (Dawes and Brown, 2002; Goyette and Mullen, 2006). With regards to attrition, it appears that international students and students from non-English speaking backgrounds (LOTE (language other than English) students) perform worse than domestic or English speaking students in an English speaking program (e.g. Williams, 1979). At the University under investigation students are asked to nominate their primary language during enrolment. Given the potential importance of both ethnic or cultural group and language, research question 3 is proposed in two parts:

RQ3a Domestic students are less likely to be at risk than international students.

RQ3b Students with a primary language other than English are more likely to be at risk than those students with English as a primary language.

The next research question considers the overall longer term consequences of being at risk. Previous research has established a connection between unsatisfactory academic performance and the likelihood of a student abandoning their course (Araque et al., 2009), and the longer the period of time that a student performs badly, the higher the risk of

voluntary attrition. However, a university may also choose to exclude a consistently poor performing student, accepting the resulting loss in resources and no opportunity to recoup them. The final question proposed considers the outcomes for at risk students in subsequent semesters and compares student characteristics for students at risk in only one semester with those who are classified as at risk again in a subsequent semester.

Additionally, student engagement with the at risk process will also be explored. It may be possible that students who choose not to engage with the University's at risk process feel they understand their poor academic performance and how to remedy it and do not need the APIP to aid them. Such reasoning might be understood, as learners are deemed to be the best judges of their own learning needs (Mager, 1964; Merrill, 1975; Merrill, 1980) and it is possible that these students may feel the at risk process would not be helpful. For those students that believe they may need additional assistance, the engagement process could be beneficial for both the student and for the University as it offers the University an opportunity to 'explore students' ideas in order to facilitate effective learning' (Taber, 1995, p. 97). The final research question proposed for this study is phrased as follows:

RQ4 Are students who engage in the at risk process less likely to be at risk again compared with those students who do not engage?

Methodology

Case studies make a valuable contribution in illustrating theory as they provide concrete examples and demonstrate relationships between constructs (Siggelkow, 2007). Further, case studies are useful when 'how' or 'why' questions are being asked and when contemporary events are being investigated (Stake, 1995; Yin, 2003). Also, the case study

methodology employs multiple sources of evidence and both qualitative and quantitative data (Yin, 2009). In this study, student demographic details (such as gender, age and primary spoken language) were sourced from online enrolment data, academic performance information was sourced from academic records, and APC information were sourced from the committee records.

Sample

The sample population comprised all at risk students from semester 2, 2006 to semester 1, 2010, across the two locations. At the Melbourne campus the at risk program has run every semester (two per calendar year) since 2006, while in Singapore (also two semesters per year) the program was introduced in Semester 2, 2008. During the total sample period of 15 semesters 1,649 students were classified as at risk.

Instruments

Once data collection was finalised the SPSS statistical software package (version 19) was used to organise and analyse the data. The analysis progressed in three stages. As a first step in the analysis an evaluation of the descriptive data using non-parametric techniques, including the chi-square test for relatedness, were undertaken to determine whether any of the categorical variables are related and to provide a profile of the at risk students, specifically the program of study and the study load (Sekaran, 2000). These tests enhance understanding of the sample through examination of the distributions of the behavioural and demographic variables.

Second, an analysis of the key demographic characteristics was conducted in order to produce a typology of once only at risk students compared with those who were at risk again. Third, a binomial logit model of 'success' was developed based on analysis of the typology of students who are at risk for a first and only time compared to students at risk more than once. As a tool of analysis, a logit model allows a researcher to predict a discrete outcome, such as group membership, from a set of variables for each case in order to determine the percent of variance in the dependent variable explained by the independent variables and to rank the relative importance of independent variables as in a rank ordered logit model (Tabnachnick and Fidell, 2007).

Results: Descriptive Statistics - At Risk Cohort

Just over half the-risk students were studying in the marketing program (52%) with the remaining at risk students studying economics/finance and this almost equal representation could account for the relationship between program and at risk status not being statistically significant. Gender is also not significant when considered in light of program and at risk status.

Almost three quarters (74%) of all at risk students are enrolled in full-time programs and the relationship between study load and at risk status is found to be highly significant, $\chi^2(1, N=1649) = 23.317, p < 0.001$, with full-time students significantly more likely to be at risk than part-time students.

Finally, the majority of at risk students (55%) were based at the Melbourne campus, with 68 per cent of these Melbourne at risk students at risk again. For the Singapore campus, 32

per cent of the students were at risk again, and 54% of those at risk students were at risk one time only. The chi-square test of the influence of campus and at risk status was statistically significant, $\chi^2(1, N=1649) = 376.88, p < 0.001$, indicating that students enrolled at the Melbourne campus are significantly more likely to be at risk than those enrolled at the Singapore campus. See Table 1.

Table 1 Research Outcomes

Research Question	Research Questions	Outcome
Descriptive statistics	Program and at risk status Load and at risk status Campus and at risk status	Not significant Significant Significant
RQ1	Male students are less likely to be at risk than female students	Unsupported
RQ2	School age students are more likely to be at risk than mature age students.	Unsupported
RQ3a	Domestic students are less likely to be at risk than international students.	Unsupported
RQ3b	Students with a primary language other than English are more likely to be at risk than those students with English as a primary language.	Supported
RQ4	Are students who engage in the at risk process less likely to be at risk again compared with those students who do not engage	Supported

Results: RQs 1-3

The majority of at risk students in Melbourne (55%) were male and in Singapore the majority were female (50.2%), but these minor differences in gender were not statistically significant, suggesting that across the whole population, at risk status is not related to gender. Hence, RQ1 is unsupported. See Table 1.

The majority of at risk students are under the age of 21 years and classified as school age (56%), but the relationship between age status and at risk status is not found to be

statistically significant. Hence, RQ2 is unsupported. The youngest students in the study were 18 years of age and the oldest were 48. The majority of at risk students were aged 21 years (16%), followed by 20 years of age (14%), 22 years (13%), and 23 years and 19 years (11% each). Age status (school leaver or mature) is found to be statistically significant when considered in conjunction with program studied, $\chi^2 (1, N=1649) = 49.893, p < 0.001$, with at risk students in the marketing program more likely to be school leavers (65%), while in the economics and finance program mature-aged students are more likely to be at risk (52%).

The relationship between residency status (domestic versus international) and at risk status is found to be statistically significant, $\chi^2 (1, N=1649) = 3.863, p < 0.01$, indicating that domestic students are significantly more likely to be at risk than international students. Given that almost two thirds (61%) of at risk students are studying in the same country in which they were born, classified as domestic students, RQ3a is unsupported. See Table 1.

The most common primary language of the at risk cohort is Chinese (including Mandarin and Cantonese, 51%) followed by English (28%), Vietnamese (4%) and Malay (2.3%). The relationship between at risk status and primary language is found to be statistically significant, $\chi^2 (1, N=1649) = 18.093, p < 0.001$, as LOTE students are significantly more likely to be at risk than English language students, 72 per cent. Thus, RQ3b is supported. See Table 1.

Results: RQ4

Fewer than half (45%) of the at risk students in the period of investigation engaged in the at risk process either through a face-to-face interview or by emailing their completed APIP to the APC. The preferred method of engagement was an interview (92%) followed by email (6.3%), with a small number of students having both an interview and returning their APIP via email (1.7%).

RQ4 sought to determine the relationship between at risk status in subsequent semesters and engagement with the at risk process. The relationship between engagement and at risk status was found to be significant, $\chi^2(1, N=1649) = 32.86, p = 0.000, p < 0.001$. Students who engage in the at risk process were significantly more likely to be at risk again in a subsequent semester (19%). Of the students who were not at risk again in a subsequent semester 40 per cent engaged in the at risk process while 60 per cent did not engage, while for students who were at risk again, 54 per cent engaged in the at risk process while the remaining 46 per cent did not engage in the at risk process. See Table 1.

Binomial Logit Model

As the outcome variable to be modelled is of a binary or dichotomous nature (engaged or did not engage, at risk again or not at risk again) (Allaway, Gooner, Berkowitz and Davis, 2006; Akinci, Kaynak, Atilgan and Aksoy, 2007) (see Figure 1) binomial logistic regression analysis was undertaken in order to model the effects of the categorical variables (program, load, campus, gender, age residency status and language spoken, and

engagement) on the two categories of outcome – at risk again or not at risk again in a subsequent semester.

Figure 1: Regression Analysis

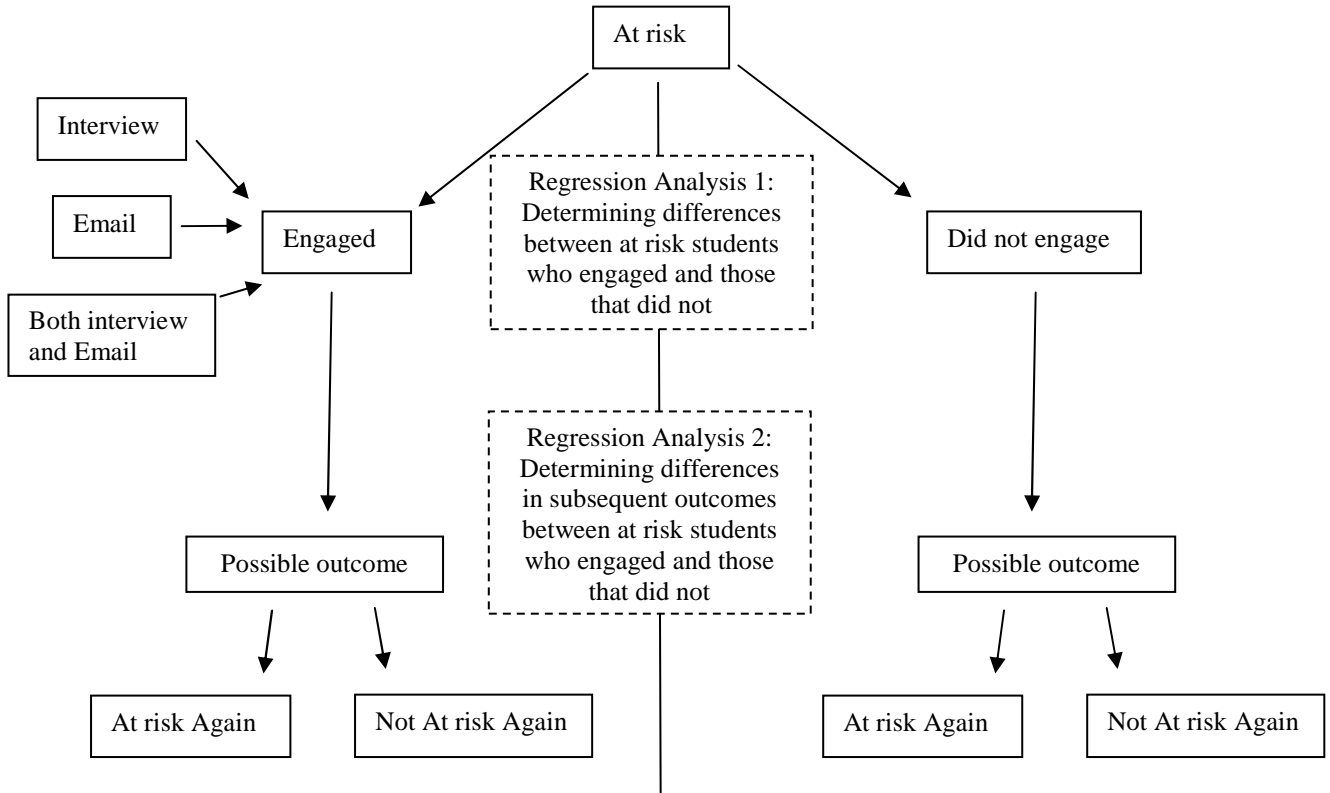


Table 2 Models for testing and results

Models	Research Questions	Significant variables
Baseline Model	To determine if the at risk students who are at risk again in a subsequent semester are different to those who are not at risk again	Program, load, campus, engagement
Model 1	To determine the differences in subsequent outcomes between only the at risk students who engaged	Program and campus
Model 2	To determine the differences in subsequent outcomes between only the at risk students who did not engage	Campus and load
Model 3	To determine the differences in subsequent outcomes between at risk students studying at the Melbourne campus	Age status and engagement
Model 4	To determine the differences in subsequent outcomes between at risk students studying at the Singapore campus	Age status, load, engagement

A baseline model was constructed on all categorical variables considering all students at risk ($n = 1,649$), and was found to be significant at the .05 level according to the chi square statistic. The analysis suggests that program ($p=.00$), load ($p=.00$), campus ($p=.00$) and engagement ($p=.00$) are significant, and that campus and engagement are highly significant in predicting whether an at risk student is at risk again or not at risk again in a subsequent semester. The model is highly effective in predicting those students not at risk in subsequent semesters (86%), but is relatively ineffective at predicting the explanatory variables for those students classified at risk again (32%).

Holding everything else constant, at risk students who engage are almost twice as likely to be at risk again in a subsequent semester; Melbourne students are more than twice as likely to be at risk again; full-time students are more likely to be at risk again; and marketing students are less likely to be at risk again in a subsequent semester (see Table 1).

There appears to be significant differences between those at risk students who engage in the at risk process compared with those who do not engage. To gain a better understanding of these potential differences the sample was split and the models rerun (model 1 and model 2) on both groups (Table 1).

Model 1 considered those students who engaged in the at risk process through either an interview, email, or both. The model is found to be significant at the .05 level according to the chi square statistic and predicts 63 percent of a respondent's behaviour correctly in terms of at risk status in a subsequent semester. The analysis suggests that program, ($p=.044$) and campus ($p=.00$) are important explanatory variables in predicting at risk outcomes in subsequent semesters. Economics/Finance at risk students, those enrolled full-

time and those studying at the Melbourne campus are more likely to be at risk again in a subsequent semester. On the basis of the significant variables the model is equally effective at explaining the reasons why engaged students may be at risk again (61%) or not at risk again (63%). Holding everything else constant, for students who did engage in the at risk process, marketing at risk students are less likely to be at risk again than Economics/Finance students and Melbourne-based at risk students are more than twice as likely to be at risk again than Singapore students. .

Model 2 considered those students who did not engage in the at risk process. The model is significant at the 0.05 level according to the chi square statistic and correctly predicts 68 percent of the respondent's behaviour in terms of at risk status in a subsequent semester. The analysis shows that campus ($p=.00$) and load ($p=.00$, at 10% significance level) are important explanatory variables in predicting at risk outcomes in subsequent semesters, when considering only those at risk students who did not engage in the at risk process. The model constructed is exceptionally effective (96%) in explaining outcomes for students not at risk again in any subsequent semester, but is not effective (8%) for those students at risk again. Holding everything else constant, Melbourne at risk students who did not engage in the at risk process are just over twice as likely to be at risk again in a subsequent semester than Singapore students and full-time at risk students are more likely to be at risk again compared to part-time students.

In the baseline model, Melbourne based at risk students are 2.4 times more likely to be at risk again in a subsequent semester compared with Singapore based at risk students.

Melbourne students who engaged in the at risk process are 2.5 times more likely to be at risk again in a subsequent semester but by comparison Melbourne students who did not

engage are slightly less likely (2.3 times) to be at risk again. There appears to be significant differences between those at risk students studying at the Melbourne campus compared with those studying at the Singapore campus, but, perhaps more importantly the at risk process is not proving benefits for the Melbourne based at risk student who engage in the process. To gain a better understanding of these differences the sample was split and the model rerun (model 3 and model 4) on both groups exclusively (see Table 2).

Model 3 considered the outcome in a subsequent semester for all Melbourne based at risk students. The model is significant at the .05 level according to the chi square statistic and predicts 60 per cent of the respondent's behaviour correctly in terms of at risk status in a subsequent semester. The analysis suggests that age status ($p=.033$) and engagement ($p=.00$) are important explanatory variables in predicting at risk outcomes in subsequent semesters for Melbourne at risk students. The model constructed is effective (77%) on the basis of significant variables in explaining outcomes in terms of not at risk again in any subsequent semester, but is only moderately effective (38%) in explaining outcomes for those students at risk again. Holding everything else constant, school leaver aged at risk students are more likely to be at risk again in a subsequent semester and students who engaged in the at risk process are more likely to be at risk again.

Model 4 considered the outcome in a subsequent semester for all Singapore based at risk students and is significant at the .05 level according to the chi square statistic and predicts 70 per cent of the outcomes correctly in terms of at risk status in a subsequent semester. The analysis suggests that age status ($p=.001$), load ($p=.033$) and engagement ($p=.00$) are important explanatory variables in predicting at risk status in subsequent semesters. The model constructed is very effective (96%) on the basis of significant variables in explaining

outcomes in terms of Singapore at risk students who are at risk again in a subsequent semester, but is not very effective (16%) at explaining outcomes for those students not at risk again. Holding everything else constant, mature aged at risk students are more likely to be at risk again in a subsequent semester, which supports previous research (Krause et al., 2005), full time at risk students are more likely to be at risk again and students who engaged in the at risk process are more likely to be at risk again.

Discussion, Implications and Conclusion

The intention of the university's at risk program is to achieve a better understanding of at risk students in-order to assist them to complete their program (articulation), rather than having these students continue to perform poorly and risk exclusion or ultimately withdraw from their studies (attrition). In general, these findings expand the results of prior studies that have demonstrated the importance of understanding attrition (for example, Davidovitch et al., 2008; Araque et al., 2009; Belloc et al., 2009; D'Souza and Maheshwari, 2010).

Student characteristics play an important role in determining success at university and the role of program of study, study load, gender, age, residency status (domestic/international) and primary language were investigated. The relationship between program studied and at risk status was not statistically significant. The relationship between load and at risk status was highly significant, with the majority of at risk students enrolled full-time. Such a finding identifies the need for further research as part-time students would perhaps have more reasons to fail their academic endeavours, given that most are working adults with competing demands on their time and resources. An investigation of the motivational characteristics of these students would be an interesting extension to this work. For

example, most business students are motivated by career opportunities such as improved job prospects and financial considerations (Kopanidis, 2008) and yet, at risk students increase the financial cost of their degree, by having to repeat subjects, and delay their entry into employment, or movement into another career.

Gender was not statistically significant and was not a significant variable in influencing at risk status when considered in conjunction with program of study. The larger number of female marketing and male economics and finance students at risk is perhaps a reflection of the gender balance in the respective student cohorts for these programs. Previous research considered the role of gender in attrition (for example, Belloc et al., 2009), for instance, in commitment to academic learning (Krause et al., 2005), the greater willingness to pursue higher education by female students (Whitehead et al., 2006), and that male students are less likely to drop out of university (Belloc et al., 2009). Our results differ from this research in that our findings confirm that demographic characteristics other than gender are more important in understanding attrition. These results highlight the need for further research.

The age of students influences performance in higher education, with older students generally perceived to perform better than their younger counterparts (Krause et al., 2005). However, age status was not significant for the at risk cohort, suggesting that other variables need to be identified if an explanation for at risk status is to be identified.

Residency status was significant, but the results differ from past research in that domestic students were more likely to be at risk than international students. Primary language was significant, with more at risk students nominating a primary language other than English, consistent with previous research (e.g. Williams, 1979). This study finds that students with a primary language other than English were more likely to be classified as at risk but that domestic students were more likely to be at risk than offshore students. It appears that while ethnic or cultural grouping may explain some of the at risk student differences, in keeping with Dawes and Brown (2002), residency status does not appear to play as significant a role as first thought. Once more, further research is required.

The relationship between engagement and at risk status was significant, showing that of the students who engaged in the at risk process slightly more than half (54%) were not at risk again in a subsequent semester, but there are locational differences; Melbourne students were less likely to succeed if they engaged. Thus, the at risk process may have helped some at risk students, but the difference is minimal. Over two thirds (68%) of the students who did not engage in the process were not at risk again and this may suggest that the majority of the students who choose not to engage in the at risk process are aware of the reasons for their academic failure and were successful in their future study efforts. One possible explanation for their success without engagement could be that these students have a strong internal locus of control. These at risk students may have self-analysed their academic failures and believe these are primarily attributed to their own abilities and efforts (Rotter, 1966) and therefore, perhaps, have the ability to moderate or adjust their own behaviour.

For those students who did engage in the at risk process one possible explanation could be that they possess an external locus of control, believing that the outcomes of their actions are mainly determined by external circumstances (Rotter, 1966), and, therefore, being more willing to participate in an external activity. At risk again students may have had weak education strategies and lacked persistence to achieve their goals and therefore were at risk again and more likely to withdraw from their program (Araque et al., 2009).

When considering engagement by at risk students in the at risk process, binomial analysis shows that program, campus and load (models 1 and 2) are statistically significant explanatory variables. Program was significant for only those students that engaged and load was significant for those that do not engage. Surprisingly, it appeared that engaging in the at risk process is significant, yet more students who engaged were at risk again in a subsequent semester compared to those that do not engage. Is it possible that the students who engaged have less idea about the reasons for their at risk status and hence engaged in an effort to find out? Or are they at risk for more serious reasons which require more than a semester to address? Do the students who did not engage already had a good idea of the reasons behind their at risk status and did not need additional help to resolve these issues? Future research is required to determine the differences between students who engage compared with those that do not.

Overall, it appeared that the at risk intervention program is not as successful in Melbourne as it is in Singapore. Perhaps the notification of at risk status was a significant motivator for Singapore-based students, thus, engagement was not the only explanation for at risk status in subsequent semesters. For Melbourne students it may be that some other intervention

strategy is required or that other variables need to be considered. This raises significant concerns for the management of the program. For example, greater resources may be required at the Melbourne campus and a review of the intervention strategy to incorporate, perhaps, earlier identification, intervention and assistance programs. Further research is required into the reasons why Melbourne campus at risk students are at a significantly higher risk of being at risk again.

In this research the binomial regression analysis was limited to accessible demographic indicators. Future research should consider additional potential indicators such as initial motivations to study, levels of drive, study techniques, utilisation of at risk learning programs such as additional tutorials and the formation of study groups, and self-efficacy or personality drivers. Academic variables such as grade point average, type and number of courses failed, and stage of progression (or year of study) (e.g. first-year compared with final-year students) could also be considered.

The learning and teaching strategies employed by the University could also be considered, for example, the overall learning and teaching philosophy of the University coupled with the learning and teaching strategies expressed by academic staff. Such strategies could then be analysed in light of different types of course work teaching, for example, lecturers and tutorials, workshops and online learning and in the different teaching models, for example, lectures and tutors, workshop coordinators and e-teachers. Such refinement of the predictor model could result in a more accurate guide to better understand the likelihood of at risk behaviour occurring and may provide new insights into how best to encourage or motivate students.

In summary, it should be noted that the at risk program is intended to be part of the University's total system of pastoral care. As such it is designed to assist struggling students to successfully complete their studies. With this in mind, this paper has investigated the influence of student engagement in the at risk program on future academic performance. We have found that the program has some success in assisting students to improve their academic performance; though simply engaging in the process is not enough to ensure improvement. We conclude by suggesting there are additional variables required to be studied to fully explain the progression of an at risk student to either attrition or successful completion.

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