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Predictors of Attrition and Achievement in a Tertiary Bridging Program

Robert Whannell
University of New England

This study examines the attrition and achievement of a sample of 295 students in an on-campus tertiary bridging program at a regional university. A logistic regression analysis using enrolment status, age and the number of absences from scheduled classes at week three of the semester as predictor variables correctly predicted 92.8 percent of participant attrition. It was concluded that attrition is largely a phenomenon associated with younger students between 18 and 24. While the quality of academic staff support was found to be strongly positively associated with the emotional commitment and academic identity of the participant, it was also negatively associated with scheduled class absence for those participants who dropped out. Intervention to address attrition of these young students is recommended to involve the selection of appropriate academic staff and a comprehensive orientation process which allows the development of supportive peer and staff relationships. The purpose of the orientation would be to facilitate the development of a robust sense of emotional commitment to a positive academic

identity prior to the completion of the initial assessment tasks.

Keywords: *bridging education, attrition, emotional commitment, identity.*

Introduction

A recent report on the tertiary education sector in Australia (Bradley, Noonan, Nugent, & Scales, 2008) commissioned by the Australian government nominated that 40% of the Australian population should possess an undergraduate degree by 2020. At the time of the report the rate was only 28%. One approach used by tertiary institutions to address this issue is through the use of tertiary bridging programs, which give individuals who do not possess the necessary academic qualifications the opportunity to gain access to tertiary study.

Student retention and academic performance in the first year of tertiary study has been extensively studied in Australia with some institutions having attrition rates of over 30% (Allen, 2010). The challenge of student attrition in tertiary enabling programs would be expected to be even greater due to the relative lack of academic preparedness of the students and has been described in previous Australian studies (Cooper, Ellis, & Sawyer, 2000; Guenther & Johnson, 2010). The current study examined two cohorts of students in an on-campus tertiary bridging program conducted at a regional university in Australia. The research question that guided the study was: What influence do social relationships have on academic attrition and achievement for students in a tertiary bridging program at a regional university?

Theoretical Context

A review of the academic literature was conducted which focused on the factors identified as being relevant to attrition during the transition into bridging programs and the first year of undergraduate university study. The literature relevant to the quality of outcomes

demonstrated by non-traditional versus traditional tertiary students was also examined.

A study (Cooper, et al., 2000) conducted over a number of years at the Whyalla campus of the University of South Australia identified an attrition rate of 50% for bridging program students. Specific reasons given for discontinuing study included problems with child care arrangements and the commencement of full-time work. The study identified that, even though students may attrit from the bridging program, their subsequent commencement of full-time work was often attributable to the new skills and confidence obtained.

A longitudinal study of tertiary student attrition utilised a quantitative approach to study data from a number of universities throughout Australia. It was established that mature age students "emerge as a highly satisfied group on the whole. They typically receive higher marks than their younger peers, and are slightly more positive about the way university has met their expectations" (Krause, Hartley, James, & Mcinnis, 2005: v). It was established that mature age students "tend to have strong clarity of purpose and are more likely to seek assistance from staff" (Krause, Hartley, James, & Mcinnis, 2005: v). Non-traditional students were also identified as receiving:

> marks higher than they expected during the first semester of study. This may reflect the general lack of confidence experienced by older students who often feel daunted at the thought of sharing classes with younger students after returning to study after years of being involved in home or work settings. (Krause, Hartley, James, & Mcinnis, 2005: 26)

The study by Krause et. al. (2005) also identified that the amount of paid work was having a negative impact on student outcomes due to students spending less time on campus. The ability to access academic staff was also reported in the study as being poor.

Tinto's (1975, 1993) Student Integration Model identifies academic and social integration as the primary influences on the decision to abandon tertiary study. One method used by tertiary institutions to facilitate student integration is through the use of orientation

programs which introduce students to the institution. In the Krause et. al. (2005) study about half of the participants described the orientation programs as being a useful introduction to the university: however fewer stated that it assisted in developing a sense of belonging. Of particular concern was that a quarter of the students sampled expressed a negative view in relation to the usefulness of orientation programs.

The related constructs of commitment to tertiary study and intention to persist or leave were identified on a number of occasions in the Krause et. al. (2005) study. Females were identified as being more likely than males to cite health as a reason for deferring, while males identified their dislike of study. An overall gender difference in the level of commitment was also identified where female students demonstrate "more academic commitment and more satisfaction with their study than the males." (Krause et. al., 2005:70). A difference was also identified in attrition based upon the enrolment status where part-time students demonstrated higher attrition levels.

Cao and Gabb (2006) completed a study at the University of Victoria which examined student attrition during the first year of study at a new generation university. The study established that females had a higher attrition rate than males with a difference between 0.8% and 4.6% being recorded. Differences in attrition rates were also identified based upon age and socio-economic status (SES). Students between 20 and 24 years of age, full-time students and those from a low SES background were demonstrated to have a lower attrition rate. The influence of distance travelled to university was also identified as being relevant to attrition and it was suggested in the study that the "difference may be related to proximity and perhaps to local loyalty to the University" (Cao & Gabb:13).

A study of Australian school leavers (McMillan, 2005) which compared young people who had dropped out of tertiary study with those who persisted identified a number of factors which were associated with lower levels of student attrition, including having parents who were tertiary educated and higher secondary school academic achievement. The study also concluded that the number

of hours of paid work influenced attrition. While no differences were identified in attrition for students who worked up to 10 hours per week, "long hours of paid work while studying were associated with higher levels of attrition" (McMillan, 2005:v). A significant finding of the McMillan study was that student interests played a major role in the situation where tertiary students change course or dropout of university. It was identified that "students less commonly cited academic difficulties, difficulties juggling work and study, or financial difficulties as their main reason for changing courses or leaving the higher education sector" (McMillan, 2005:v).

The role of academic and social support was identified in a study done at the Queensland University of Technology (Tindle & Lincoln, 2002) relating to mature age students in their first year of tertiary study. The study participants identified the following factors, in order of frequency, as important to their academic success: social support from fellow students, preparation before arrival at university, family support, access to on-line resources, accessibility to academic staff, and personal attitudes with students referring to their own determination and perseverance in the face of obstacles.

Cantwell, Archer and Bourke (2001) compared the performance of undergraduate students from three non-traditional entry modes with that of students who had gained tertiary access traditionally. The study made a number of conclusions, including identifying that age was "a significant predictor of academic achievement, with older students outperforming younger students" and that "most older females faced more physical and psychological demands in their lives outside university than younger students" (Cantwell, Archer & Bourke, 2001:232). Of particular interest was the conclusion that socio-economic status did not emerge as a significant influence on performance. The academic performance of students who gained access via enabling programs was also found to be comparable with those who gained access via traditional entry.

A comparison of the undergraduate performance of mature age students who had gained entry to the University of Newcastle via an enabling program and younger students who gained access based

on high school results has also been conducted (Archer, Cantwell & Bourke, 1999). The study concluded that mature age students coped "at least as well with their undergraduate studies as younger students entering via more conventional means" (Archer, Cantwell & Bourke, 1999:52). The research also identified a number of approaches to study exhibited by older students which gave them an advantage when engaging in undergraduate study. Older students were identified as having "more confidence to solve problems that arise in their lives, more confidence to plan a desired course of action, and more confidence to appraise accurately their strengths and weaknesses" (Archer, Cantwell & Bourke, 1999:50).

A particular challenge for mature age students with a substantial work history is the ability to adapt to, and engage with, tertiary study. While they may have "developed a positive learning profile, a continued belief in the structural simplicity of knowledge appear[s] to have a significant diminishing effect on the quality of adjustment and on the quality of learning outcomes" (Cantwell & Scevak, 2004:131). The adaptive ability of students is considered to have potential application to a tertiary bridging program where students are entering an educational environment from which they have been absent for a substantial period of time and with which they are unfamiliar. This would be expected to lead to substantial cultural and emotional shock. In such a situation, the ability to adapt quickly to the new environment would appear to be of importance to a successful transition during the early weeks of the bridging program.

Debenham and May (2005:89) also identified early experiences in an enabling program as being of particular importance when they stated that "the first milestone in an enabling program for both students and lecturers is the submission and return of the first assignments [and] it can be asserted … that the first assignment is surrounded on all sides by anxiety". They also concluded that "initially students are threatened by 'academic work'.

The literature reviewed indicates that the quality of outcomes for non-traditional students in undergraduate tertiary study is comparable to that achieved by students gaining entry by traditional means.

However, the attrition rate in tertiary bridging programs appears to be high, with attrition as high as 50% being recorded. A number of factors, such as gender, hours of paid work and the quality of orientation programs, have been identified as influencing attrition.

Method

A questionnaire was developed composed of an introductory demographics section followed by a series of Likert-style items using a five point scale ranging from Strongly Disagree to Strongly Agree. The questionnaire was reviewed by a number of academics to ensure the face validity of the items. It was also piloted utilising 63 respondents from a previous cohort of the bridging program. The final version of the questionnaire was completed in week three of two different semesters by a total of 295 respondents, comprising 94 (31.9%) males and 201 (68.1%) females, giving a response rate of 48%. This ratio of males to females is consistent with historical enrolment patterns in the program.

An analysis of the demographic data established that 221 (75%) students had attended a public secondary school, while 159 (54%) had completed secondary school. One hundred and forty seven (50%) participants reported that at least one immediate family member had attended university. These figures are consistent with research which has examined a previous cohort of students from the bridging program (Whannell, Lynch & Allen, 2010).

A Principal Components Analysis using Direct Oblimin rotation and Kaiser normalisation was completed using the Likert-style items. A five factor solution was identified which accounted for 59% of the shared variance in the factor items. The five scales comprised a total of 30 items giving a 9.3:1 response to item ratio. Factors were named based upon their constituent items and are summarised in Table 1.

Table 1: Questionnaire Scales

Scale	No Items	Cronbach's Alpha
Peer Support	8	.872
Emotional Commitment and Identity	7	.882
Family Support	6	.893
Staff Support	5	.809
Academic Self-Efficacy	4	.773

All items loaded on their respective factor with a minimum of .575 with all inter-item correlations for a given factor being statistically significant with $p<.01$. The Cronbach's alpha values demonstrate a good level of internal reliability for each scale. The eigenvalues and percentage of variance explained by the factors are shown in Table 2.

Table 2: Variance explained by five factor solution

Factor	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
Peer Support	8.887	27.771	27.8
Emotional Commitment and Identity	3.256	10.174	37.9
Family Support	2.945	9.204	47.1
Staff Support	2.119	6.621	53.8
Academic Self-Efficacy	1.734	5.419	59.2

The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was .885 indicating that there were sufficient items included in the analysis, while the Bartlett's Test of Sphericity ($p<.001$) indicated that the correlation matrix was suitable for factor analysis.

The family, staff and peer support scales included items such as "My family are supportive of my desire to attend university", "I have developed good relationships with other students at university" and

"Academic staff are supportive of my attempt to complete university study". The emotional commitment and identity scale included items such as "I feel proud of being a university student", "I am strongly committed to pursuing my educational goals" and "I like going to university". The academic self-efficacy scale included items such as "I consider myself to be a good student" and "I am a good note-taker in lectures". The academic self-efficacy scale was intended to address skills applicable to the bridging program.

The course results for participants were also examined with a view to determining what factors were associated with academic achievement. The result used was obtained by calculating the mean percentage of all assessment tasks completed prior to week five of the semester.

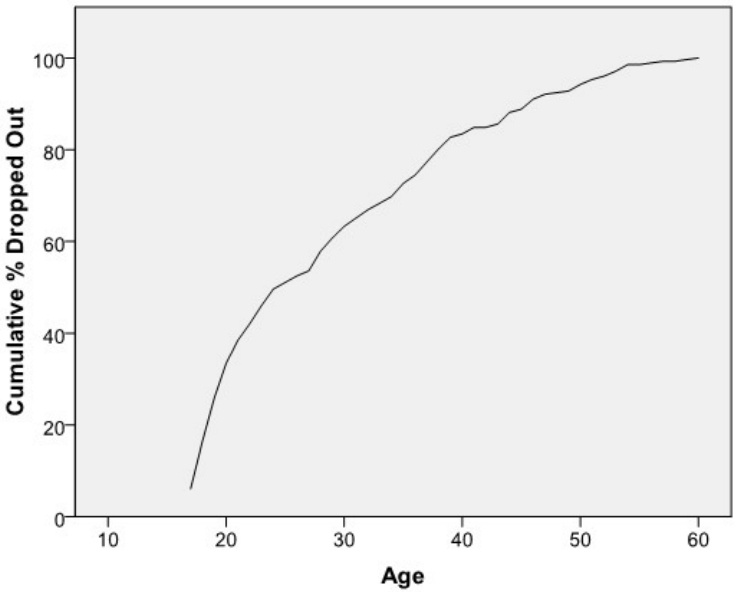
Findings and Discussion

The various demographic variables were examined to identify any statistically significant differences based upon program completion. No statistically significant differences were identified in attrition based upon gender (χ^2 *(df=1,N=275)=0.433,p=0.511*), secondary school type attended (χ^2 *(df=3,N=271)=0.948,p=0.814*), residential status (χ^2 *(df=4,N=274)=5.778,p=0.216*), whether the participant had completed secondary school (χ^2 *(df=1,N=270)=0.145,p=0.703*), whether the participant was the first in family to attend university (χ^2 *(df=1,N=274)=0.565,p=0.452*) or enrolment status (χ^2 *(df=1,N=275)=1.910,p=0.167*). The lack of a statistically significant difference based upon enrolment status is contrary to the findings in previous studies (Hillman, 2005; Krause, Hartley, James, & Mcinnis, 2005). A statistically significant difference was identified in relation to the number of scheduled classes missed by participants (*U=5404.5,Z=-4.221,p<0.001*) with participants who failed to complete the program (*Mean Rank=165.9*) demonstrating a higher level of absence than those who completed the program (*Mean Rank=127.5*).

A statistically significant difference in attrition based on age (*U=5636,Z=-3.179,p=0.001*) was identified, with younger

participants demonstrating a higher dropout rate. The age range of the participants was from 17 to 60 with a median age of 24 with substantial positive skewing. Figure 1 shows the cumulative percentage frequency graph for participants who dropped out of the program.

Figure 1: Cumulative % frequency attrition



The graph demonstrates that attrition is a phenomenon mainly associated with younger participants. An examination of the correlations involving younger participants and scheduled class absence identified the quality of staff support as being associated in an unusual manner. For participants between 17 and 24 years of age who did not complete the program a significant correlation is evident between absence from scheduled classes and the quality of staff support (ρ=-0.309,p=0.035,N=47). The correlation between these variables for participants in this age range who did complete the program differs radically (ρ=0.112,p=0.292,N=90). The correlations between these variables for participants older than 24 are also not

statistically significant, irrespective of whether the program was completed or not (Dropped Out: $\rho=0.006,p=0.977,N=27$;Completed: $\rho=-0.049,p=0.613,N=109$). This data identifies age and the associated level of staff support as important factors in the attrition phenomenon for the participants.

One cited influence on attrition at the tertiary level is the hours of paid work which students complete (Krause, et al., 2005; McMillan, 2005). The dataset was coded to differentiate between students based upon the hours of weekly work reported at the week 3 data collection and using 15 hours as the cut-off point. A Pearson Chi-Square test identified no statistically significant difference in program completion ($\chi^2=0.816,p=0.366,N=275$) between these participants and those who completed less than 15 hours of paid work each week compared to those who had completed a greater number of hours. A comparison was also made of the extreme cases of those participants who reported having no outside paid work with those who reported doing 20 or more hours per week. A statistically significant difference in the attrition rates between these extreme groups ($\chi^2=0.796,p=0.372,N=211$) was not evident. A Mann-Whitney U test of Item 40 (The amount of paid work I do interferes with my university study) ($U(df=144)=1887.5,Z=-0.096,p=0.924$) also gave no statistically significant difference based upon whether the participant had completed the full bridging program. Contrary to the existing literature (Krause, et al., 2005; McMillan, 2005) which has identified the number of hours of outside work as increasing tertiary student attrition, it does not appear to be the case for the participants in this study.

Independent samples *t*-tests were conducted on each of the summated scales in order to identify scales which may be predictive of program attrition. Outliers were removed from the analysis by examination of the boxplots. Only the quality of peer support demonstrated a substantial difference based upon program completion ($t(269)=-1.863,p=0.064,d=0.23$) with those students reporting higher levels of peer support demonstrating lower levels of attrition. No statistically significant differences were identified for the level of emotional commitment and identity

(*t(266)=.356,p=0.722*), family support (*t(271)=-1.376,p=0.170*), staff support (*t(269)=0.228,p=0.820*) and academic self-efficacy (*t(261)=0.629,p=0.530*).

A number of the Likert-style items from Section 2 of the questionnaire were also tested to determine if there were any differences related to program attrition. Item 30 (The university provides excellent student support services) (*U=7100.5,Z=-0.248,p=0.608,N=271*), Item 39 (Travel to and from university is not a problem) (*U=7178,Z=-0.213,p=0.831,N=271*) and Item 42 (My family responsibilities make it hard to cope with my university study) (*U=7044.5,Z=-0.087,p=0.930,N=269*) demonstrated no statistical difference based upon program completion.

The influence of academic results on attrition was tested by examining the data available for the overall secondary school performance (Item 7) and the mean result obtained on the first assessment tasks. An independent samples t-test conducted on the secondary school academic result identified no statistically significant difference based upon attrition (*t(220)=-0.390,p=0.697*). A statistically significant difference was identified for the result on the first assessment task in the bridging program ($t(230)=-2.544, p=0.012$, $\bar{X}_{Dropped\ Out}=73.3$, $\bar{X}_{Completed}=78.1, d=0.4$). While the association between attrition and academic performance for tertiary students is supported by other literature (Bean & Metzner, 1985; Cabrera, Nora, & Castaneda, 1993), the lack of association with secondary school academic performance is considered rather unusual. Secondary school academic performance is commonly identified as a good predictor of academic performance at the tertiary level of education, where success at secondary school is predictive of success at university (Dobson & Skuja, 2005; Evans, 2000; Evans & Farley, 1999). In this study, secondary school academic performance has not been associated with either better academic performance or higher rates of attrition. This would indicate that the use of academic performance at secondary school as a means of screening potential students for the bridging program would not be appropriate.

Thus, the factors which have been identified as having a significant difference based upon whether the participant completed the full bridging program are:

- Age, with older participants demonstrating a lower attrition rate;
- Absence from scheduled classes, with lower attrition associated with lower levels of absence;
- Academic performance at the first assessment task, with better performance being associated with a lower attrition rate;
- The quality of peer support, with higher levels of support being associated with a lower attrition rate.

A binary logistic regression analysis was conducted using the data from the week 3 collection to identify if a combination of predictor variables was available which could accurately predict attrition from the program. It was expected that the variables which would be suitable for inclusion in the logistic model would be those identified in the previous section as they were identified as having substantial differences based upon program completion.

The independent variables included in the logistic regression model were age, the number of scheduled classes which were missed, the performance on the first assessment task and the level of peer support which was available. Four cases with missing data and cases with a Cook's measure of influence greater than one or with standardised residuals greater than ±2 were considered outliers and were not included in the analysis, as recommended by Field (2009). The final analysis included 209 cases. A test of the model which included the predictors against a constant-only-model was statistically reliable, (χ^2 *(df=4,N=209)=57.691,p<.001*), indicating that the predictors reliably distinguished participant attrition. Nagelkerke's R^2*=.578* indicated a strong relationship between the predictor variables and the attrition outcome while the Hosmer and Lemeshow test (χ^2 *(df=8)=0.622,p=1.0*) indicated a good match between predicted and observed probabilities. The model correctly allocated 92.8% of the cases, with 37.5% of the participants in the attrition group being correctly allocated and 97.4% of participants in the completion group

correctly allocated. According to the Wald criterion, the four predictor variables all made a statistically significant contribution to the prediction: participant age (*z=6.288,p=0.012*), number of scheduled classes missed (*z=5.826,p=0.016*), result on the first assessment task (*z=8.865,p=0.003*) and the level of peer support (*z=8.126,p=0.004*).

The SPSS result for the variables table of the regression analysis is shown in Table 3.

Table 3. Logistic regression for program attrition – week 3 data collections

						95% C.I. for Exp(B)		
Measure	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Age	.578	.230	6.288	1	.012	1.782	1.135	2.799
Classes Missed	-.433	.179	5.826	1	.016	.649	.456	.922
Task 1 Result	.103	.035	8.865	1	.003	1.109	1.036	1.187
Peer Support	.288	.101	8.126	1	.004	1.334	1.094	1.625
Constant	-22.025	6.356	12.008	1	.001	.000		

The Exp(B) values indicate the extent to which the corresponding odds ratio is influenced by an increase of one unit in the variable. Thus, an increase in the age, task 1 result or the level of peer support variables will result in an increase in the probability of completion, while increased absence from scheduled classes will result in a reduction in the probability of successful completion.

A corelational analysis was also completed to examine the association between the variables. The correlation matrices relating all of the relevant variables, including achievement on the first assessment task, were generated for both the participants who completed the bridging course and those who did not in order to identify possible differences between the groups. Table 4 shows the correlation matrix for the scales from the week 3 data collection with the mean result on the first assessment tasks across all courses for those participants who completed the bridging program.

Table 4. Spearman's scale correlations week 3

Measure	1	2	3	4	5	6	7	8	9
1. Task 1 Result	--								
2. Emotional Commitment and Identity	.164*	-							
3. Family Support	.109	.336**	--						
4. Peer Support	.046	.285**	.278**	--					
5. Staff Support	.132	.382**	.298**	.404**	--				
6. Self Efficacy	.162*	.413**	.278**	.368**	.309**	--			
7. Age	.261**	.078	-.050	.011	.139	-.078	--		
8. Hours Study	.173*	.234**	-.038	.104	.054	.092	.193**	--	
9. Scheduled Classes Missed	-.322**	-.016	.093	-.081	.016	-.099	-.317**	-.129	--

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Sample size range = 190 to 200

The correlations suggest that social factors were only indirectly associated with academic achievement in the early transitional period. While the correlation between the result on task 1 and the level of staff support was just outside the cut-off for significance at the 95% confidence level, the size of the association was low. The primary indicators of achievement early in the bridging program appear to be absence from scheduled classes, which was negatively correlated with achievement, and age. Age was also negatively associated with absence from scheduled classes. This again identifies age as an important factor in the outcomes achieved by participants in the program.

Table 5 shows the correlation map summarising the statistically significant correlations for those participants who failed to complete the bridging program.

Table 5. Spearman's scale correlation matrix week 3 –attrition group

	1	2	3	4	5	6	7	8	9
1. Task 1 Result	--								
2. Emotional Commitment and Identity	.030	--							
3. Family Support	-.099	.277*	--						
4. Peer Support	.006	.249*	.258*	--					
5. Staff Support	.158	.517**	.396**	.422**	--				
6. Self Efficacy	.000	.348**	.322**	.285*	.369**	--			
7. Age	.350*	.061	-.019	.191	.292*	-.163	--		
8. Hours Study	.147	.220	.049	.229	.337**	.209	.166	--	
9. Scheduled Classes Missed	-.093	-.059	.010	-.164	-.278*	-.146	-.281*	-.169	--

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Sample size range Task 1 Result = 38 to 39

Sample size range all other scales = 72 to 75

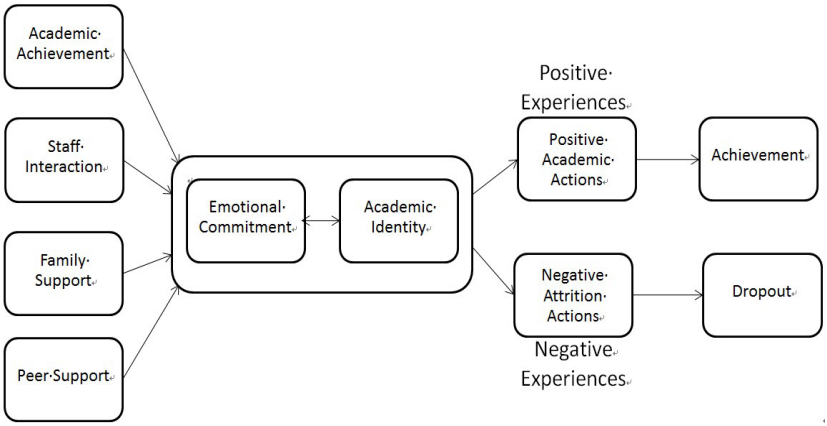
A difference in relation to the role of academic staff support is apparent in the correlations at week 3 based upon whether the participant completes the bridging program or not. Non-completers demonstrated a substantially higher level of association between staff support and their emotional commitment and identity. The participants who completed the program demonstrate no significant associations between staff support and the hours of study or scheduled classes missed. Both of these behaviours demonstrate significant associations for non-completers with higher levels of staff support being associated with higher levels of study and fewer classes missed. As the age of the non-completers is reduced, the association between staff support and absence from scheduled classes increases (Age≤24 years: ρ=-.309,p=.035,N=47;Age≤22 years: ρ=-.347,p=.026,N=41).

Conclusions

It was concluded that student attrition from the bridging program was primarily associated with the age of the participant and absence from scheduled classes. Attrition was identified as being essentially a phenomenon involving younger participants, who also demonstrated lower levels of academic achievement in the early weeks of the semester. Both peer support and staff support are concluded as having different roles to play in the process. Peer support was found to associate positively with higher levels of emotional commitment and identity, hours of study and academic self-efficacy during the early weeks of the semester and peers are considered to provide a support mechanism in assisting with coping with the rigours of the academic program during this time. Participants who completed the bridging program also had significantly better peer relationships than those who did not. Academic staff are considered to have had an important role to play for younger participants who did not complete the full program. These participants reported a substantial negative association between their level of emotional commitment and identity and absence from scheduled classes with the quality of staff support which they perceived available.

The analysis of the data may be modelled theoretically as shown in Figure 2.

Figure 2: Theoretical model for the role of academic identity in achievement and attrition during bridging program transition



The model assumes that students will enter the bridging program with an existing academic identity and associated identity commitment constructed as a consequence of the experiences during the years of their primary and secondary schooling. The nature of the experiences students have which occur within the context of their attendance in the bridging program would then further shape their academic identity. Scanlon, Rowling and Weber (2007:223) identified that "it is the nexus of situated interactions with lecturers and other students that is the context and process of [student] identity formation". Where experiences provide support for, and allow the development of commitment to a positive and appropriate academic identity, the student will engage in positive academic behaviours, particularly study and attendance at scheduled classes, which will facilitate good academic outcomes. Conversely, negative experiences will cause a reduction in the commitment to the academic identity which will result in an increase of attrition related behaviours. The "fit between the student's identity production and their perception of the successful or enculturated student in their institution and program of study…is important in their retention by the institution" (Johnson & Watson, 2004:474). It would be expected that, due to the previous poor educational experiences and academic outcomes achieved by many students who enrol in the bridging program, there would be a heightened vulnerability to negative experiences, particularly related to staff/student interactions and assessment in the early transitional period. This model of the process involving the bridging program students' emotional experience and identity as a student was described in similar terms by Ingleton (1999). He viewed the decisions that students make in relation to learning as being dependent on their attitude towards learning and their self-esteem and identity as a student. He proposed that these aspects were developed as a consequence of their social interactions with teachers, peers and parents and their experiences of success OR failure within the academic context.

The model includes academic achievement as one of the factors which influences academic identity and commitment to that identity. It should be noted that this construct is considered to be broader than the results obtained on formal assessment tasks. While the analysis

only included such tasks, it is the case that some students attend the bridging program and withdraw prior to the first tasks which are submitted in week five of the semester. Students will form a sense of their level of academic achievement from informal as well as formal situations, and for this reason may be prompted to drop-out of the program even before the completion of any formal assessment.

It is concluded that interventions to address tertiary bridging program attrition would require the involvement of academic staff who are able to engage with students and develop appropriately supportive relationships. These interventions, designed to build a more robust sense of emotional commitment to a positive tertiary student academic identity, would also need to specifically target younger students as an at-risk group. Further research in relation to the form which such interventions should take would be required.

The results of this study also indicate that the process of identity building should commence at the earliest possible opportunity with activities which enhance emotional commitment and academic identity included in orientation programs. The process of orientation and enculturation should also not be considered to cease once the semester has commenced. Rather, early learning experiences made available to tertiary bridging students, many of whom are unfamiliar with formal education, also need to be designed and delivered with a view to the building of the students' sense of scholarly identity. Academic staff across all content areas should use teaching pedagogies which continue to build on the interventions commenced in the orientation program.

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About the Author

Dr Robert Whannell *is currently employed as a Research Fellow at the University of New England in Australia. He was a lecturer in a tertiary bridging program from 2006 to 2011 and has been engaged in teaching introductory, undergraduate mathematics*

courses. His current research focus is in relation to the transition experiences of tertiary bridging students into undergraduate study.

Contact details

rwhannel@une.edu.au