

EQUITY GROUPS AND PREDICTORS OF ACADEMIC SUCCESS IN HIGHER EDUCATION

A 2014 Student Equity in Higher Education Research Grants Project

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Executive Summary

Research studies in the United States of America identified differences between First in Family (FiF) and non-FiF students. There is contradictory evidence regarding differences in college achievement between FiF and non-FiF students in the USA. Some studies found no differences (Inman and Mayes, 1999; Strage, 1999) and other studies indicated lower GPAs for first-generation students (Martinez, Sher, Krull and Wood, 2009; Pascarella et al., 2004).

Australian research on FiF university students is limited in number and in the scope of variables that may impact on achievement and university experience. The limited research on FiF students in the Australian context has covered aspects related to decision-making and enrolment patterns as well as attributions and indicators of success (Luzecy et al., 2011). These students were more likely to be enrolled in certain degrees (Education, Economics and Science as opposed to Law, Medicine and Engineering), be older, and come from a rural background.

The aim of this study was to investigate the influence of FiF status, socio-economic and demographic contributors to the academic outcomes of students enrolled in a large regional Australian university.

Key Findings

- FiF students were more likely to be female (69%) than non-FiF students (50%).
- FiF students were more likely to be older than non-FiF students. FiF students (M = 22.43 years) were slightly older than non-FiF (M = 21.50).
- FiF and non-FiF students did not differ in entry pathways to university study.
- There were no significant differences between FiF and non-FiF students in full time or part time enrolment. Similarly, there were no differences between FiF and non-FiF enrolment in degree type (Business/Commerce, Engineering/Construction Management, Sciences, Allied Health), year level of study (Year 1-4) or hours attended.
- Before enrolling in university studies, FiF students knew significantly fewer university students (0-4) than non-FiF students.
- FiF students differed significantly from non-FiF in their response to the question, "How likely it would be for you to ask a lecturer or tutor for academic help?" FiF students were extremely unlikely to do so.
- FiF and non-FiF did not differ in their responses to asking a student for academic help.
- FiF students were significantly less confident than non-FiF students in using Blackboard.
- FiF students worried significantly more about living and educational expenses than non-FiF students.
- FiF students did not differ from non-FiF in number of hours enrolled in university study, number of hours spent in independent study, approach to learning (surface/deep), seeking student help, degree satisfaction, integration into university and First Year GPA and Second Year GPA.
- FiF students scored significantly lower than non-FiF students on coping with the academic workload, complexity of course material, intention to continue with the course, seeking resource help, academic skills confidence.

Background

Higher education is an important pathway to achieve occupational success and social status in all industrialised countries across the globe. The Council of Australian Governments has set a target of 40% of Australians aged 25-34 years to have at least a bachelor degree by 2020 (Bradley, Noonan, Nugent and Scales, 2008). The *Reform Beyond the Crisis Report* (Australian Government Productivity Commission, 2008/09) said that by 2020, 20% of undergraduate enrolments in higher education in Australia should be from low socio-economic backgrounds.

As a result the defining character of higher education in the past 50 years is one of massification of higher education (Teichler, 2001, 2003). Massification is reflected in the increased proportion of the population participating in higher education and in the increased diversity of the student population. This diversity can be typified by the addition of groups of 'non-traditional' students who are categorised in terms of their background characteristics: low socioeconomic status (SES); membership of particular ethnic and cultural groups; non-urban dwelling; mature age; and first-in-family university status (Schuetze and Slowey, 2002).

The student population is becoming more and more diverse in its demographic make-up (e.g., Benson, Heagney, Hewitt, Crosling and Devos, 2013). In particular, the proportion of mature-age students in university study has increased over the last twenty years, and the literature suggests that this new cohort has brought new challenges with it (e.g., Mallman and Lee, 2014; Stone and O'Shea, 2013). Females have historically been under-represented in higher education enrolments generally however this is no longer the case in most countries including England (HEFCE, 2013) and Australia (Department of Education, 2013).

Research studies in the United States of America identified differences between FiF and non-FiF students. Pascarella et al. (2004) concluded that FiF students are at a relative disadvantage in terms of knowledge about post-secondary education options, educational expectations and plans and academic preparation. Aspelmeier et al (2012) highlighted that FiF students are more likely than non-FiF students to come from lower SES backgrounds and certain ethnic minority groups; are generally older; and tend to have more negative attitudes towards their academic potential and lower academic self-efficacy.

Pascarella et al.'s (2004) study in the USA suggested that FiF students have a more difficult transition to college and are confronted with multiple issues related to cultural, social and academic transition. FiF students report feeling less prepared for and less knowledgeable about college and more worried about failing than non-FiF students (Aspelmeier et al., 2012; Padgett, Johnson and Pascarella, 2012).

There is contradictory evidence regarding differences in college achievement between FiF and non-FiF students in the USA. Some studies found no differences (Inman and Mayes, 1999; Strage, 1999) or that Grade Point Average (GPA) was influenced by prior academic preparation (Choy, 2001). Other studies indicated lower GPAs for first-generation students (Martinez, Sher, Krull and Wood, 2009; Pascarella et al., 2004).

Australian research on FiF university students is limited in number and in the scope of variables that may impact on achievement and university experience. The limited research on FiF students in the Australian context has covered aspects related to decision-making and enrolment patterns as well as attributions and indicators of success (Luzecy et al., 2011). These students were more likely to be enrolled in certain degrees (Education, Scevak, Southgate, Macqueen, Rubin, Douglas and Williams, September 2015

Economics and Science as opposed to Law, Medicine and Engineering), be older, and come from a rural background.

James (2002) found that students who come from a background of low participation perform less successfully at university (Bamber and Tett, 2000). Given the paucity of research literature on FiF students, and the array of variables that may impact on their academic outcomes and their university experience, it is important that more studies pursue this line of enquiry in order to inform decisions about the type of support and support services required to meet the needs of this group.

The aim of this study was to investigate the influence of FiF status, socio-economic and demographic contributors to the academic outcomes of students enrolled in a large regional Australian university.

After examination of a large regional university's institutional data on first in family (FiF) status (students who are first in their family to attend university), this study investigated the reasons for the differences in achievement depending on the degree program examined. More specifically, it was found that some degree programs saw FIF students perform worse than their non-FIF peers, and in others, they performed better. In another group of programs there was no difference in achievement between FIF and non-FIF students. The research study sought to examine the reasons for such differences.

Research Questions

1. Do First in Family students differ from non-FiF students in demographics, entry pathway to university, enrolment status, degree type enrolled in, social connections, help seeking, worry about expenses and engagement with university studies?
2. Do First in Family students come from lower socio-economic backgrounds than non-FiF students?
3. Are there differential levels of academic success measured by Grade Point Averages (GPAs) amongst First in Family and non-FiF groups enrolled in the same programs and what student and program characteristics relate to this?

Methodology

Study Design

In order to answer the research questions, the study used a quantitative research design and data was collected using a survey.

Participants

Participants were 983 undergraduate students at a large regional Australian university. Participants were sampled from five broad degree types: Allied Health (Podiatry, 12.51%; Nutrition and Dietetics, 2.24%; Occupational Therapy, 10.27%), The Sciences (Science, 12.11%; Environmental Science and Management, 8.95%; Medical Radiation Science, 0.31%), Engineering (Mechanical Engineering, 3.97%; Construction Management, 1.53%), Business and Commerce (10.78%), and Medicine (13.43%). The remaining 9.77% of students did not indicate their degree program.

Instrument

A survey instrument (available upon request) was developed containing 41 questions covering:

- Demographics: Participants were asked their age and gender, and whether they identified as an Indigenous Australian or were from a non-English speaking background.
- Social: Participants were asked to indicate their living arrangements during the semester, whether they had carer responsibilities, whether they were in paid work, how often they had worried about their living and educational expenses over the past month, and social network prior to university.
- Entry pathway to university and enrolment: Participants were asked how they qualified to be accepted into university, whether they were a full or a part-time student, the degree they were studying and year level.
- Socioeconomic status, social class and First-in-Family status: Participants answered a question indicating which suburb or town they reside in. This information was coded to derive a Socio-Economic Index for Areas – Index of Education and Occupation (SEIFA-IEO) score (ABS, 2011). Measures of socioeconomic status were included. Participants were asked about the highest level of education achieved by their parents. The options on this question were based on the Australian Qualifications Framework, and ranged from Primary education to Doctorate (ABS, 2001). Participants were also asked whether they were the first in their family to attend university.
- Perceived socioeconomic advantage was estimated by combining four questionnaire self-rating items. These were:
 - Family Income [rated from: 1(well below average) to 5 (well above average)]
 - Highest Educational Level Achieved for Parents [Primary School to Doctorate, coded as 1-9]
 - Father's Job Prestige [rated from 1 (extremely low status) to 11 (extremely high status)], and
 - Mother's Job Prestige rated from 1(extremely low status) to 11 (extremely high status)].
- Perceived social class was estimated by combining three questionnaire self-rating items. These were mother's social class, father's social class, the respondent's own social class. Each item was rated from 1 (working-class) to 5 (upper-class). A high score indicates higher perceived social class.

- Mother's occupational status and father's occupational status was estimated via the AUSE106. This classification indicates sociologically meaningful occupational status scores in accordance with the official occupational classifications of the Australian Bureau of Statistics (2011).
- Worry about expenses: Worry about expenses was estimated by combining two self-rating items. Respondents were asked to indicate how often they had worried about living expenses, and education expenses, over the last month.
- Engagement with university studies and GPA: Participants were asked questions to assess their degree of engagement with the university learning and a self-report GPA question. Students were asked how satisfied they were with their overall sense of belonging, social, and academic experience at university.
- Psychometric measures:
 - The mental health inventory-five (MHI-5) (Berwick et al, 1991)
 - Approaches to Learning (Biggs, 2010). Approaches to learning (deep and surface) contained twenty items rated on a 5-point Likert scale
 - Experience of university survey (based on Stebleton, Soria and Albecker, 2012). Students were asked about the frequency with which they had engaged in academic-related activities during the last semester, and
 - Epistemological beliefs adapted from Schommer (1993).

Sample

University data were examined to select degree programs in which First in Family (FIF) and low socioeconomic status (SES) undergraduate students had better, same, or less successful academic outcomes than their non-FIF and other SES peers.

Students were recruited from the following degree programs:

- Bachelor of Engineering (Mechanical), Bachelor of Environmental Science and Management, Bachelor of Medical Radiation Science (Radiation Therapy) constitutes the low FIF success group.
- Bachelor of Science, Bachelor of Nutrition and Dietetics, Bachelor of Construction Management (Building) and Bachelor of Occupational Therapy degree programs constitute the similar levels of success group.
- Bachelor of Business, Bachelor of Podiatry, Bachelor of Medical Radiation Science (Diagnostic Radiography) and Bachelor of Commerce degree programs represent the high FIF success group.

Analysis

Data were examined to determine whether there were any differences between equity groups (FiF, low SES, Indigenous, NESB, mature age and those with carer responsibilities) and non-equity group students. A series of ANOVAs were conducted using categorical variables. Multiple Regression analysis was conducted to identify predictors of academic success. Retrospective and current data on student outcomes (GPA, progression, enrolment status) from their first year of enrolment until the end of 2014 were included in the analysis.

Results

Research Question 1

“Do FiF students differ from non-FiF students in demographics, entry pathway to university, enrolment status, degree type enrolled in, social connections, help seeking, worry about expenses and engagement with university studies?”

Demographic Differences Between FiF and Non-FiF Students

FiF students were more likely to be female (69%) than non-FiF students (50%). FiF students were more likely to be older than non-FiF students. FiF students ($M = 22.43$ years) were slightly older than non-FiF ($M = 21.50$).

Entry Pathway to University

FiF and non-FiF students did not differ in entry pathways to university study

Enrolment Status, Degree Type, Year Level and Attendance Hours

There were no significant differences between FiF and non-FiF students in full time or part time enrolment. Similarly there were no differences between FiF and non-FiF enrolment in degree type (Business/Commerce, Engineering/Construction Management, Sciences, Allied Health), year level of study (Year 1-4) or hours attended.

Social

Before enrolling in university studies FiF students knew significantly fewer university students (0-4) than non-FiF students.

Help Seeking

FiF students differed significantly from non-FiF in their response to the question, “How likely it would be for you to ask a lecturer or tutor for academic help?” FiF students were extremely unlikely to do this. FiF and non-FiF did not differ in their responses to ask a student for academic help. In addition FiF students were significantly less confident than non-FiF students in using Blackboard.

Worry About Expenses

FiF students worried significantly more about living and educational expenses than non-FiF students.

Engagement with University Studies and GPA

FiF students did not differ from non-FiF in number of hours enrolled in university study, number of hours spent in independent study, approach to learning (surface/deep), seeking student help, degree satisfaction, integration into university and First Year GPA and Second Year GPA.

FiF students scored significantly lower than non-FiF students on coping with the academic workload, complexity of course material, intention to continue with the course, seeking resource help, academic skills confidence.

Qualitative Data

At the end of the survey, participants were asked to comment on the questions, “What things have hindered your learning at university? What things have helped your learning at university?”

Comments were separated firstly into helping factors and hindering factors – some categories were the same (i.e. identified as both helping and hindering by different students).

Taking into consideration the ratio of FiF to non-FiF students, differences were found with regards to support from family and friends, personal characteristics, travel/transport arrangements, computer/internet issues and work/life balance. FiF students were less likely to report being helped by family and friends, and more likely to refer to their own attributes as having been of help. FiF students were more likely to report being hindered by family and friends (though these comments were few), travel or transport arrangements, issues with IT, computers or Internet, and by finances, paid work and time.

Research Question 2

“Do First in Family students come from lower socio-economic backgrounds than non-First in Family students?”

Compared to non-FiF students, FiF students had significantly lower educational advantage (ICSEA). FiF students perceived their socioeconomic status, and their social class identity, as well as their mother’s and father’s occupational status significantly lower than non-FiF students.

Research Question 3

“Are there differential levels of academic success (measured by GPA) amongst equity and non-equity groups enrolled in the same programs and what student and program characteristics relate to this?”

The sample for this analysis excluded respondents who did not indicate whether or not they were FiF (n = 14), non-Australian citizens (n = 107), and medicine students (n = 130, because medical students are graded pass/fail which is unsuitable for analysis of GPA). Of the remaining respondents, 359 granted permission to utilise their official academic transcripts. From this sample of interest, 141 (39.3%) were FiF, 207 (57.7%) were Female, and the mean age was 22.9 years (SD = 6.9 years).

Initial analysis did not find a difference between FiF and non-FiF students on levels of success. However, some studies have proposed female advantage to be prevalent among students from a socioeconomically disadvantaged background (Buchmann and DiPrete, 2006; Alone, 2007). Since FiF and socioeconomic advantage are so closely linked, this suggests an interaction in FiF and gender whereby females suffer less from FiF status than males.

This hypothesis was tested directly in the study. FiF students were also more likely to be female. This proportional sex difference is critical because females also

displayed a higher cumulative GPA than males and therefore sex was included as a covariate in the analyses of GPA.

Cross-sectional Analysis FiF, Gender, and Academic Performance

To examine the relationship between FiF and academic performance a univariate analysis of variance (ANOVA) was conducted on cumulative GPA by FiF status, with gender included as a covariate. Results showed that FiF students had a significantly lower cumulative GPA's than non-FiF students

To examine the effect of FiF status over time, a mixed model ANOVA was performed with GPA as a dependent measure, Year (1 and 2) as a within-subjects explanatory variable, FiF Status (FiF and non-FiF) as a between subjects variable. Gender was included in the model so that any interaction between gender and FiF and year could be detected.

There was a strong effect of FiF Status. However, Year by Sex interaction and the Year by FiF Status interaction were non-significant. This finding highlights that the sizeable effect of FiF Status on GPA did not decrease in the second year of study. To test potential mediators of this relationship between FiF and academic performance, a mediation analyses using ordinary least squares path analysis PROCESS (Hayes, 2013) was conducted. Mediator variables were tested individually. From these analyses the relationship between FiF and academic performance was not mediated by educational advantage, perceived socioeconomic status, perceived social class identity, mother's occupational status or father's occupational status. None of the variables age, work hours, integration into the university, independent study hours, mental health, enrolled hours, how well a student was coping with their academic workload, how complex a student felt their course material was, academic skill confidence, or whether the student was likely to continue their course mediated the relationship between academic performance and FiF.

These results suggest that worry about expenses is a key variable that may exacerbate the disadvantage experienced by FiF students in terms of academic performance. Results from this study are in line with research from the United States that indicates FiF can be strongly linked to social class and economic variables (worry about finances). The cumulative GPA results confirmed FiF students are at a disadvantage compared to their non-FiF counterparts in a large regional Australian University.

The cross-sectional data confirmed the effect of FiF Status on GPA when female advantage was considered. Year 1 and 2 data suggested that any effect on GPA was consistent in Year 2 of university study.

This study, *Equity Groups and Predictors of Success in Higher Education*

The aim of this study was to investigate the influence of FiF status, socio-economic and demographic contributors to the academic outcomes of students enrolled in a large regional Australian university. The results from this analysis showed that there was a strong effect of FiF Status on First Year GPA. Of particular interest is that the sizeable effect of FiF Status on Second Year GPA did not decrease.

In addition, the study examined a number of variables that have played a role in mediating the relationship between FiF status and academic outcomes. From these analyses it was found that the relationship between FiF and academic performance was not mediated by educational advantage, perceived socioeconomic status, perceived social class identity, mother's occupational status or father's occupational status.

None of the variables age, work hours, integration into the university, independent study hours, mental health, enrolled hours, how well a student was coping with their academic workload, how complex a student felt their course material was, academic skill confidence, or whether the student was likely to continue their course mediated the relationship between academic performance and FiF. However, worry about finances exacerbated the influence of FiF on academic performance. This suggests that worry about expenses is a key variable that may exacerbate the disadvantage experienced by FiF students in terms of academic performance.

Conclusion

This Australian study produced results in line with research from the United States of America that indicates that being First in Family can be strongly linked to social class and economic variables. The cross-sectional cumulative GPA results confirmed FiF students are at a disadvantage compared to their non-FiF counterparts in a large regional Australian university.

Terenzini et al. (1996) suggested that FiF students might face a number of unique challenges. For example, FiF students may find it difficult to balance the expectations of family and friends with educational demands. In addition, FiF students may have fewer positive out-of-class experiences than traditional students, and their grade point averages were lower than non-FiF students. Riehl (1994) attributes this to FiF students coming from families in which the understanding of academic norms, expectations and demands would be lower than in families of non-FiF students.

Recent research by Padgett, Johnson and Pascarella (2012) using longitudinal data from the Wabash Longitudinal Study of Liberal Arts Education found that FiF are at a significant disadvantage compared to their non-FiF peers.

Further research needs to be carried out to explore the unique challenges that FiF students face and to identify the type of support they need to help overcome these challenges. Therefore, it is important that support is tailored to modify the message or strategy so that there is a closer fit to this target group as opposed to a general orientation for all students.

Reference List

- ABS. (2001). *Australian Standard Classification of Education (ASCED)*. Canberra.
- ABS. (2011). Technical paper: Socioeconomic indexes for areas (SEIFA). Retrieved July 23, 2013, from <http://www.abs.gov.au>.
- Alon, S. (2007). The effect of overlapping disadvantages on the racial/ethnic graduation gap among students attending selective institutions. *Social Science Research* 36 (4), 1475–1499.
- Aspelmeier, J., Love, M., McGill, L., Elliott, A., & Pierce, T. (2012). Self-Esteem, Locus of Control, College Adjustment, and GPA Among First- and Continuing-Generation Students: A Moderator Model of Generational Status. *Research in Higher Education*, 53(7), 755-781. doi: 10.1007/s11162-011-9252-1.
- Australian Government Productivity Commission (2008-09). *Annual Report. Reform beyond the crisis*. Retrieved October 2, 2010 from www.pc.gov.au/__data/assets/pdf_file/0020/92054/10-references.pdf.
- Benson, R., Heagney, M., Hewitt, L., Crosling, G., & Devos, A. (2013). *Managing and supporting student diversity in higher education: A casebook*. Oxford, UK: Chandos.
- Berwick, D. M., Murphy, J. M., Goldman, P. A., Ware, J. E., Jr., Barsky, A. J., & Milton, C. W. (1991). Performance of a Five-Item Mental Health Screening Test. *Medical Care*, 29(2), 169-176. doi: 10.2307/3766262.
- Biggs, J., Kember, D., & Leung, D. Y. (2001). The revised two-factor study process questionnaire: R-SPQ-2F. *British Journal of Educational Psychology*, 71, 133-149. doi: 10.1348/000709901158433.
- Bradley, D., Noonan, P., Nugent, H. & Scales, B. (2008). *Review of Australian higher education. Final report*. Canberra, Australia: Commonwealth of Australia. Retrieved October 14, 2010 from <http://www.deewr.gov.au/HigherEducation/Review/Pages/ReviewofAustralianHigherEducationFinalReport.aspx>.
- Buchmann, C., & DiPrete, T.A. (2006). The Growing Female Advantage in College Completion: The Role of Family Background and Academic Achievement. *American Sociological Review*, 71, pp515-541.
- Choy, S. (2001). Students whose parents did not go to college: Postsecondary access, persistence, and attainment, *NCES Report No. 2001-126*. U.S. Department of Education, National Center for Education Statistics.
- Devlin, M., & O'Shea, H. (2011). Directions for Australian higher education institutional policy and practice in supporting students from low socioeconomic backgrounds. *Journal of Higher Education Policy and Management*, 33(5), 529-535. doi: 10.1080/1360080x.2011.605227.

- Devlin, M., & O'Shea, H. (2012). Effective university teaching: views of Australian university students from low socio-economic status backgrounds. *Teaching in Higher Education*, 17(4), 385-397. doi: 10.1080/13562517.2011.641006.
- Goldin, C., Katz, L.F. & Kuziemko. (2006). The Homecoming of American College Women: The Reversal of the College Gender Gap. NBER Working Paper No. 12139, <http://www.nber.org/papers/w12139>.
- Hayes, A. F. (2013). *An introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: Guilford Press.
- HEFCE. (2013). Trends in young participation in higher education. Retrieved 4 February 2014, from <http://www.hefce.ac.uk/pubs/year/2013/201328/name,83272,en.html>.
- Inman, W. E., & Mayes, L. (1999). The importance of being first: Unique characteristics of first generation community college students. *Community College Review*, 26(4), 3.
- Jacob, B. (2002). Where the boys aren't: non-cognitive skills, returns to school and the gender gap in higher education. *Economics of Education Review* 21, 589–598.
- James, R., Bexley, E., Anderson, A., Devlin, M., Garnett, R., Marginson, S., & Maxwell, L. (2008). *Participation and equity: A review of the participation in higher education of people from low socioeconomic backgrounds and Indigenous people*. Deakin, ACT: Universities Australia.
- Luzeckyj, A., King, S., Scutter, S., & Brinkworth, R. (2011). The significance of being first: A consideration of cultural capital in relation to "first in family" student's choices of university and program. A Practice Report. *The International Journal of the First Year in Higher Education*, 2(2), 91-n/a. doi: <http://dx.doi.org/10.5204/intjfyhe.v2i2.89>.
- Mallman, M., & Lee, H. (2014). Stigmatised learners: Mature-age students negotiating university culture. *British Journal of Sociology of Education*, 1-18. doi: 10.1080/01425692.2014.973017.
- Martinez, J. A., Sher, K. J., Krull, J. L., & Wood, P. K. (2009). Blue-collar scholars?: Mediators and moderators of university attrition in first-generation college students. *J Coll Stud Dev*, 50(1), 87-103.
- Padgett, R. D., Johnson, M. P., & Pascarella, E. T. (2012). First-generation undergraduate students and the impacts of the first year of college: Additional evidence. *Journal of College Student Development*, 53(2), 243-266.
- Pascarella, E. T., Pierson, C. T., Wolniak, G. C., & Terenzini, P. T. (2004). First-Generation College Students: Additional Evidence on College Experiences and Outcomes. *The Journal of Higher Education*, 75(3), 249-284. doi: 10.2307/3838816.
- Riehl, R.J. (1994) The academic preparation, aspirations and first-year performance of first-generation students. *College and Universities, Fall: 14-19 College and University*, v70 n1 p14-19 Fall 1994.

- Schommer, M. (1993). Comparisons of Beliefs about the Nature of Knowledge and Learning among Postsecondary Students. *Research in Higher Education*, 34:2, pp 355-370.
- Schuetze, H. G., & Slowey, M. (2002). Participation and exclusion: A comparative analysis of non-traditional students and lifelong learners in higher education. *Higher Education*, 44(3-4), 309-325.
- Soria, K. M., & Stebleton, M. J. (2012). First-generation students' academic engagement and retention. *Teaching in Higher Education*, 17(6), 673-685. doi: 10.1080/13562517.2012.666735.
- Stone, C., & O'Shea, S. E. (2013). Time, money, leisure and guilt-the gendered challenges of higher education for mature-age students. *Australian Journal of Adult Learning*, 53, 95-116.
- Strage, A. A. (1999). Social and academic integration and college success: Similarities and differences as a function of ethnicity and family educational background. *College Student Journal*, 33, 198-205.
- Teichler, U. (2001). Mass higher education and the need for new responses. *Tertiary Education and Management*, 7(1), 3-7. doi: 10.1080/13583883.2001.9967035.
- Teichler, U. (2003). The future of higher education and the future of higher education research. *Tertiary Education and Management*, 9(3), 171-185. doi: 10.1080/13583883.2003.9967102.
- Terenzini, P. T., Springer, L., Yagger, P., Pascarella, E., & Nora, A. (1996). First-generation college students: Characteristics, experiences, and cognitive development. *Research in Higher Education*, 37(1), 1-22. doi: 134.148.5.68 on Thu, 16 Jul 2015 06:13:12 UTC.

Appendix 1: Descriptive Statistics

Nominal and Ordinal Data by FiF

Table 1.
Descriptive Statistics of Categorical Variables for FiF Students

Variable	FiF (%)	Non-FiF (%)	χ^2 (df)
Sex			
Male	114 (37.25)	258 (48.68)	10.25(1)**
Female	192 (62.75)	272 (51.32)	
Australian Citizen			
Yes	291 (95.10)	472 (88.89)	9.29(1)**
No	15 (4.9)	59 (11.11)	
Carer			
Rarely	205 (69.02)	351 (69.09)	4.27(3)
Sometimes	52 (17.51)	96 (18.90)	
Often	12 (4.04)	30 (5.91)	
Constantly	28 (9.43)	31 (6.10)	
Before university, how many university students did you know?			
0-4	132 (43.14)	143 (26.93)	28.2(3)***
5-9	70 (22.88)	127 (23.92)	
10-14	33 (10.78)	61 (11.49)	
15+	71 (23.20)	200 (37.66)	
Entry Pathway			
School Qualification	202 (66.45)	362 (70.02)	6.36(4)
TAFE	19 (6.25)	25 (4.84)	
Open Foundation	44 (14.47)	49 (9.48)	
New Step	12 (3.95)	26 (5.03)	
Other	27 (8.88)	55 (10.64)	
Degree			
Business/Commerce	91 (33.46)	150 (31.71)	2.57(3)
Engineering/Construction Management	14 (5.15)	39 (8.25)	
Sciences	77 (28.31)	129 (27.27)	
Allied Health	90 (33.09)	155 (32.77)	
Load			
Full Time	273 (89.80)	469 (90.19)	.033(1)
Part Time	31 (10.20)	51 (9.81)	
Level			
1	184 (60.53)	273 (52.50)	13.4(3)**
2	73 (24.01)	147 (28.27)	
3	42 (13.82)	66 (12.69)	
4	5 (1.64)	34 (6.54)	
Attend Hours			
<50%	14 (4.61)	24 (4.62)	2.99(2)
50-75%	51 (16.78)	113 (21.73)	
>75%	239 (78.62)	383 (73.65)	
Ask a Student for Academic Help			
Extremely Unlikely	15 (5.07)	22 (4.37)	2.46(3)
Quite Unlikely	24 (8.11)	29 (5.77)	
Quite Likely	87 (29.39)	141 (28.03)	
Extremely Unlikely	170 (57.43)	311 (61.83)	
Ask a Lecturer or Tutor for Academic Help			
Extremely Unlikely	13 (4.38)	25 (3.13)	7.98(3)*
Quite Unlikely	25 (8.42)	76 (15.11)	
Quite Likely	140 (47.14)	215 (42.74)	
Extremely Unlikely	119 (40.07)	187 (37.18)	
I am Confident Using Blackboard[#]			
Strongly Disagree	1 (0.34)	3 (0.60)	8.56(3)*
Disagree	2 (0.67)	12 (2.40)	
Agree	89 (29.87)	185 (36.93)	
Strongly Agree	206 (69.13)	301 (60.08)	

Notes: *= $p < .05$; **= $p < .01$; ***= $p < .001$ FiF=First-in-family; non-FiF=non first-in-family. # = 20% cells expected count < 5

Continuous Data by FiF

Table 2.

Descriptive Statistics of Continuous Variables (Differences between FiF and non-FiF students on continuous variables)

Variable	Mean	SD	Skew	M_Diff (FiF-nonFiF)	α	FIF (t)
Measures						
Age_Log10	1.35	.096	1.89	.019		2.77**
Social Class Measures						
ICSEA_n	0.09	.544	.115	-.224		2.12*
SEIFA_n	0.00	1.00	-.07	-.344		4.60***
Mothers AUSEIO6_n	0.00	1.00	-.16	-.738		9.73***
Fathers AUSEIO6_n	0.00	1.00	-.07	-.7.71		10.4***
Number of Rooms in House Growing Up_n	0.0	1.00	-.08	-.379		5.32***
Social Class_n	0.00	1.00	.42	-.386	.805	5.35***
SES_n [INCLUDES FiF]	0.00	1.00	-.47	-1.41	.7	22.6***
Financial Measures						
Worry About Expenses	2.29	.85	.29	.228	.721	3.75***
Work Hours	12.01	11.32	.82	.034		.041
Engagement with University						
Enrolled Hours	16.33	8.20	1.17	-.250		.533
Hours Per Week in Independent Study	13.10	9.94	1.46	-.211		.286
Coping with Academic Workload	4.33	1.23	-.25	-.266	.702	2.96**
Likelihood of Continuing Course	5.23	1.76	-.94	-.262	.863	2.10*
Complex Material	4.80	1.45	-.58	.222		2.19*
Integration into University Community	4.70	1.28	-.46	-.096	.915	1.03
Seeking Resource Help	2.44	.65	-.05	.098	.56	2.11*
Academic Skill Confidence	3.09	.49	-.20	.055	.807	1.54
Degree Satisfaction	2.99	.50	-.27	-.009	.728	.250
Dispositions						
Mental Health Score (MHI-5)	66.05	19.72	-.62	-2.26	.846	1.57
Deep Knowledge	2.78	.639	.14	.092	.806	1.94
Surface Knowledge	2.41	.65	.35	.014	.779	.294
Belief in Certainty Knowledge	2.13	.43	0.00	-.072	.403	2.25*
Grade Point Average						
1 st Year GPA	4.88	1.33	-1.28	-.056		.397
2 nd Year GPA	4.92	1.38	-1.22	-.205		1.04
> 1 st Year GPA	5.02	1.16	-.79	-.103		.607
Most Recent GPA	4.91	1.59	-1.58	-.074		.438
Cumulative GPA	4.90	1.28	-1.31	.009		.067
Self Reported GPA	5.02	1.15	-.83	.021		.255

Notes: *= $p < .05$; **= $p < .01$; ***= $p < .001$; Social Class, SES, Worry about Expenses, Coping with Academic Workload, Likelihood of Continuing Course, Integration Score, Seeking Resource Help, Skill Confidence, Degree Satisfaction are all based on factor scores calculated from EFA analyses; SD=Standard Deviation; Skew=Skewness; α =Cronbach's alpha; SEIFA IEO=Socio-Economic Indexes for Areas Index of Education and Occupation (ABS, 2011).