

2016

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This conference paper was originally published as:

Hoyne, G., & McNaught, K. (2016). Changing practices to better support first-year Health Science students. *STARS*.

<http://unistars.org/papers/STARS2016/01A.pdf>

Original conference paper available here:

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Changing practices to better support first-year Health Science students

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Abstract

Entrance to university in Australia, in a post-Bradley era, is diversified and massified, with targets and programs to increase the participation of equity groups that were previously not represented. The changed cohorts have major implications for universities, in meeting the students' needs, and as a moral and ethical response to enrolment. At the University of Notre Dame Australia (UNDA) Fremantle campus, the 2011 cohort entering Health Sciences, experienced a high rate of failure and withdrawal from university. They entered university at a time when UNDA had begun to implement first year experience (FYE) pedagogical approaches but these had not been entirely implemented in all the Schools across campus. This research has tracked the performance of first year Health Science students from 2011 -2015. This paper discusses the School and Institutional-wide response that was initiated to address the issue of student attrition and how this led to a significant changes to the FYE transition approaches within the School to support students better at the start of their courses and student success with a reduction in failure rate and withdrawal rate of First Year students.

The importance of the first year of higher education experience (FYE) to student success and retention at university is well researched. Student retention is a multifactorial problem that cannot be resolved to a single matter or characteristic (Kift & Nelson 2005, Trotter & Roberts 2006). Intrinsic behaviours of students including motivation, self-efficacy, resilience, and self-discipline, are important to academic success (Burton & Dowling, 2005; Reynolds and Weigand, 2010). Although noted by Tumen et al (2008, p.249):

Students' academic achievement and study style during their studies were found to be the most critical factors affecting both completion and withdrawal from a program. First-year student experience appears to be key to student success; in particular the intensity of study in the first year was found to be a significant determinant of completion.

A myriad of factors including financial pressures, extracurricular commitments, poor attendance at university, lack of a "personal fit" with the institution, the quality of teaching, and the large size of teaching classes are just some issues that influence attrition. Early intervention and support strategies are essential to help first-year students achieve their goals (Nelson, Quinn, Marrington, & Clarke, 2012, Nelson & Clarke 2014). When students transition from their secondary school to higher education, they may experience a significant shift in the expectations around both teaching and learning. Tertiary institutions, along with government-funded programs, have devoted significant resources to help support the transition of students from school to university that encompass the FYE.

The concept of transition is not solely a first year experience, students must negotiate change as they progress through each year of their course and experience a "transition of becoming" as they see themselves as an experienced practitioner in their chosen profession (Ecclestone, Biesta & Hughes, 2010). Progression through each of these developmental stages requires a level of self-awareness. The FYE area has been a focus of much research and as summarised by Nelson and colleagues the different approaches have evolved over time (Nelson & Clarke, 2014). The first generation approaches focused on student-centred activities that progressed to development of FYE curriculum, through to the third phase of developing institution-wide

practices. The experience from this University is that Health Science students are less likely to seek academic support than students from other faculties (McNaught & McIntyre, 2012). This was magnified with the cohort of Health Science students who commenced in 2011. These students experienced a high failure rate in units and a large proportion withdrew from university within the first 12 months. In response to the high attrition rate a range of FYE initiatives were implemented by the School of Health Sciences and the University from 2012. In this paper we have examined the impact these initiatives have had on student retention and academic success of first year Health Science students over the period of 2011-2015.

Methodology

Enrolment and performance data

The student enrolment data were collected from Student Admissions Office at University of Notre Dame Australia (UNDA). Final grades for all Health Science units were obtained following ratification by the Board of Examiners' meetings that were held at the end of each semester. The information of the post-entrance literacy assessment (PELA) was collated for all Schools on the campus by the Academic Enabling Support Centre (AESC) at the University of Notre Dame Australia.

Post Entrance Literacy Assessment

The PELA assessment approach was based on a validated, internationally used tool, the Texas Higher Education Assessment approach (Pearson, 2008; Hughes & Scott-Clayton, 2010). The value and worth of PELA approaches has been demonstrated (Kenelly, Maldoni & Davies 2010) and a national review of PELA programs, 'Degrees of Proficiency' demonstrated the validation processes used by the sector. (Dunworth, 2013).

Ethics Approval

The study received approval from the University of Notre Dame Human Ethics Research Committee in 2012 Reference # 012063F.

Statistical analysis

Statistical analysis of student failure rate was examined using a Fischer Exact test (Graph Pad software). The significance level was set at $p < 0.05$.

Results

The cohort of Health Science students that commenced in 2011 experienced a high failure rate over their first year at university with a 49% attrition and only 11% completed their undergraduate course. There was a slight gender bias for the 2011 cohort toward female students (60-40 ratio female: male) whereas since then subsequent cohorts have had a more balanced 50:50 ratio (data not shown). In 2011, the AESC introduced a PELA test for the first time in a number of Schools across the campus that incorporated a reading and writing assessment component. The PELA test was delivered in the first two weeks of semester 1 and students received feedback by week 4 and those who scored below the designated benchmark values were encouraged to attend academic support courses in reading and/or writing. Feedback was provided to all students in written form from the AESC and by email and in lectures by academic staff. As has been reported previously, 51% of students in the 2011 cohort were identified as below the benchmark in reading and/or writing but none of these students attended the free academic support courses on offer (Hoyne & McNaught, 2013). In

2012 the School of Health Sciences altered School Regulations to make it compulsory for students identified as below the benchmark in PELA tests to attend free academic support courses in reading and/or writing. This provided us with an opportunity to compare the student academic performance and attrition at period of time when attendance at academic support courses was optional (2011), to those students where attendance was mandatory (2012 onwards). Since 2012 all students identified being below the bench mark in PELA have attended the required academic support courses.

The data shown in Table 1 provides an overview of the performance of Health Science students in the PELA reading and writing components over the period 2011 – 2014 compared to the range of scores for students in other Schools at the University. At this granular level it would appear that there has been a general improvement of literacy skills in First Year Health Science students over the study period. The value of the longitudinal study highlighted that Health Science students consistently performed worst on the Reading component of the PELA compared to students in other Schools for each semester.

Table 1 Percentage of Health Science students below the benchmark in PELA 2011-2014

	School of Health Science	Range for Other Schools**	School of Health Science	Range for Other Schools
Semester	Reading*		Writing	
S1 2014	25%	6-25%	10%	2-17%
S1 2013	24%	16-26%	18%	0-22%
S1 2012	63%	30-45%	40%	13-49%
S1 2011	54%	42-52%	64%	22-71%

* % of students below Benchmark, ** Other Schools include, Business, Arts and Science, Education, Nursing and Physiotherapy.

We examined the performance of Health Science students in the PELA based on their entry pathway to university to determine if a particular group of students were more “at risk” compared to others. Consistent with the data in Table 1 there was a significant improvement in performance in the Writing component of the PELA assessment with a decrease in students who fell below the benchmark score across all entry pathways over the period of 2011-2015 (Fig 1A). In 2011 ~60% of first year Health Sciences students were below the writing benchmark and this has decreased to ~ 10% in 2015. Although there has been a general trend toward improvement in the reading assessment for all entry pathways, the Cert IV and the mature age students have consistently been the worst performers in the PELA writing and reading over the study period (Fig. 1B).

The University offers two different bridging courses to students who leave School and have not attained the minimum ATAR score of 70 that is required for entry into Health Science undergraduate courses. These bridging programs are referred to as the Foundation Year (FY) and the Tertiary Enabling Program (TEP). The FY/TEP students displayed improved results in PELA reading over the study period. The secondary school graduates who entered via

ATAR have improved their performance in PELA reading and only 15% high school graduates are below the reading benchmark in 2015.

Next we examined the fail and pass rates, and the withdrawal rates of Health Science students and compared these to first year students in other Schools on the Fremantle campus including Nursing (SON), Business (SOB) and Arts & Science (SOAS) (Fig. 2) during 2011-2014.

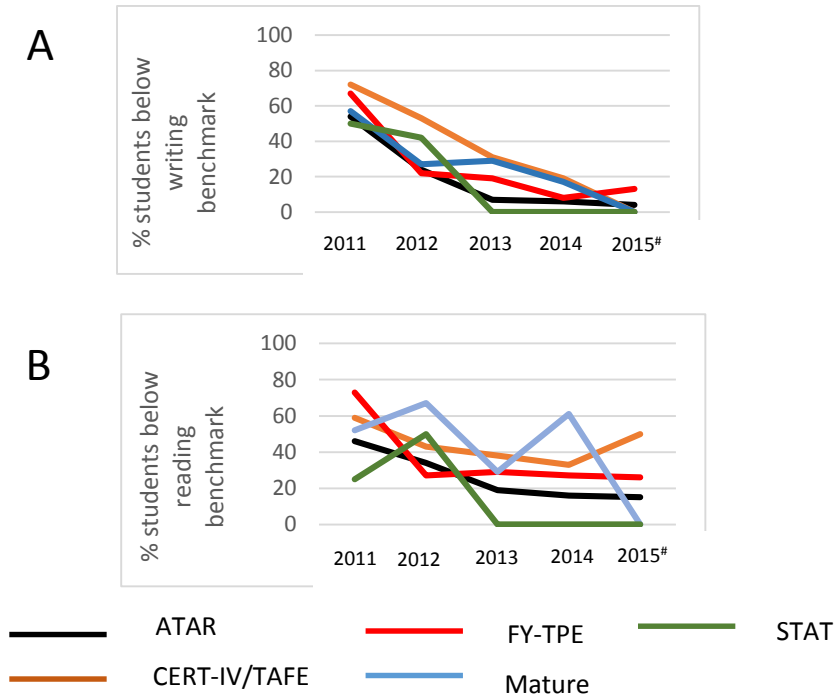


Figure 1. Student outcomes following PELA Assessment. The frequency of students that were below the benchmark for (A) PELA reading and (B) PELA writing has decreased over time. # 2015 data represents semester 1 results only.

Each of the latter 3 Schools also run PELA assessments for First Year students but in contrast to the School of Health Sciences, these 3 Schools had already introduced mandatory attendance to academic workshops for those students who were below the bench mark score in PELA in 2011.

The radar plots shown in Figure 2 provides a visual comparison of 3 variables (i) the fail rate, (ii) pass rate and (iii) the withdrawal rate across the four schools. In 2011 the withdrawal rate for Health Science students exceeded the pass rate and fail rate for units indicating a large attrition rate from Health Science courses as stated previously. By 2012 after attendance at academic support courses was made compulsory there has been a significant increase in the pass rate for Health Science students, and a decrease in the fail rate and a significant reduction in students withdrawing from their courses. This reduction in units failed by first year Health Science students has been maintained over a 3 year period of 2012-2014 (Figure 3) and in 2015 it has fallen to 18% (data not shown). The School of Health Science appears to be the only School that has managed to maintain a lower withdrawal rate of First Year student's during the period 2012-2014 when compared to the other 3 Schools SON, SOB and SOAS (Figure 2). All the other Schools have experienced a higher withdrawal rate of students that exceeds the proportion of students that fail units in each year

Encouraged by the decreased failure rate of first year Health Science students we examined the data in more detail to tease out the performance of students based on their entry pathway

to university. The data in Figure 4 reveals that there has been a general improvement in all students irrespective of their entry pathway. Although the mature age students tend to perform worse in the PELA reading (Figure 1B), they have been some of the best performing students in 2012 and 2013. The FY/TPE students have been more variable in their success over the 4 year tracking period with higher failure rates in 2013 and 2014.

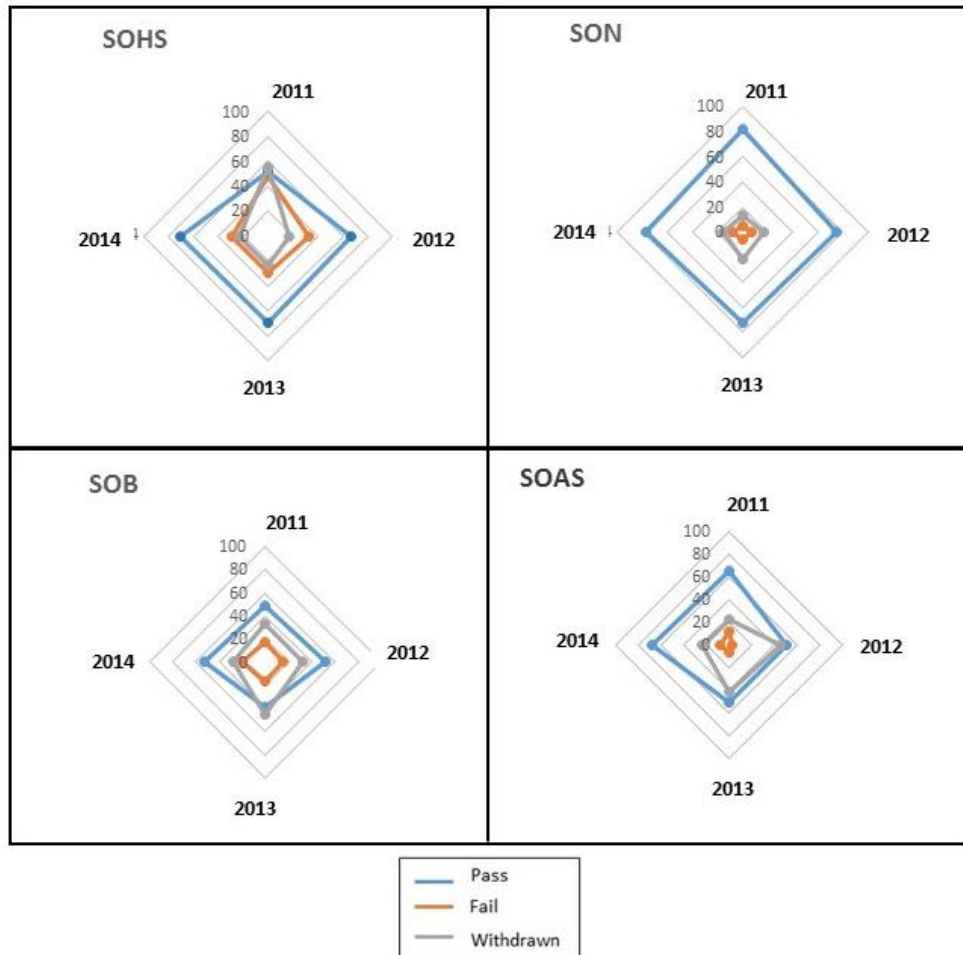


Figure 2. Comparison of the pass, fail and withdrawal rates for First year students across different Schools at UNDA during the period 2011 -2014. SOHS = School of Health Sciences, SON School of Nursing, SOAS School of Arts and Sciences and SOB School of Business. Data shows the percentage of students within the entry cohort for each year that have passed, failed or withdrawn from the university

Finally we have examined the fail rate for those students who scored below the benchmark for PELA from 2011 - 2015 to determine if the introduction of mandatory attendance to academic support courses has led to improved academic success. As shown in Figure 5 there had been a significant decrease in failure rate of units for these students. There was a significant decrease in 2012 when attendance to support courses first became mandatory and there had been a continual improvement each year. Therefore it would appear that the mandatory intervention has had some impact on student performance but we cannot categorically conclude that the improvement is due only to this intervention as will be discussed further below.

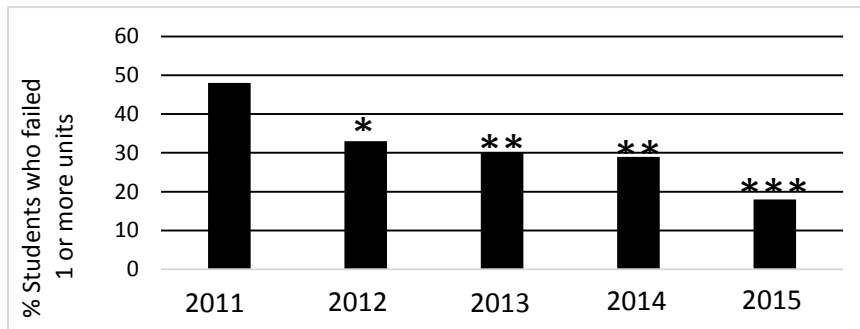


Figure 3. The failure rate of first year Health Science students across all degrees. There has been a significant decrease in failure rate of first year students since the introduction of compulsory attendance to academic support in 2012. Two tailed p values that compare the 2011 result to each year: 2012 $p=0.0434$, 2013 $p=0.0135$, 2014 $p=0.0087$, 2015 $p=0.0001$.

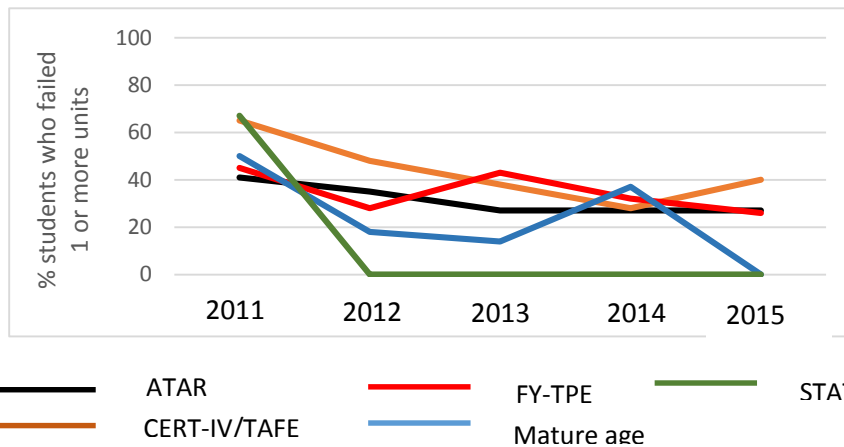


Figure 4. The failure rate of students via entry pathway. The data reports a decrease in failure rate since the introduction of compulsory attendance to academic support in 2012. Two tailed p values that compare the 2011 result to each year: 2012 $p=0.05$, 2013 $p=0.0074$, 2014 $p=0.0134$, 2015 $p=0.043$.

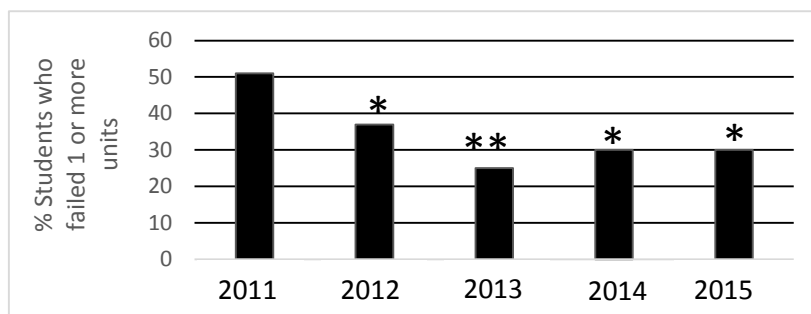


Figure 5. The failure rate of First Year students who were identified as being below the benchmark for PELA reading show a significant decrease in failure rate since the introduction of compulsory attendance to academic support in 2012. Two tailed p values that compare the 2011 result to each year: 2012 $p=0.05$, 2013 $p=0.0074$, 2014 $p=0.0134$, 2015 $p=0.043$.

Discussion

The phenomenon of cohorts with particular and enduring characteristics is not new to anyone who works in education. The 2011 cohort of Health Science students experienced a high rate of failure and attrition from university in their first year and only 10% of the cohort graduated from their course. In response the School and University implemented a range of changes to improve student retention. We have tracked student performance over a 4 year period and we have demonstrated significant decrease in the failure rate of First Year students, a concomitant decrease in withdrawal rates and an increase in pass rates for students over their first year at university. The improvement in academic performance in first year Health Science students has been observed in all students irrespective of their entry pathway to university. There does not appear to have been any significant change to ATAR entry scores in recent years (data not shown), which suggests that the improvement cannot be solely due to the university attracting “academically stronger” students. The failure rate of Health Science students has reduced from 50% in 2011 to just below 30% in 2014/15. That means one third of students are likely to fail at least one unit and this proportion has not changed over the last 3 years (Figure 3). Therefore the School and University cannot become complacent and it highlights further improvements need to be made to further reduce the fail rate of first year students.

The PELA assessment would generally be regarded as a blunt instrument to predict students who may struggle academically in their chosen course. This is supported by the observation that some students who fall below the benchmark score in the PELA that is delivered in week 1 of semester 1, enter with a high ATAR score >80 and will go onto to pass all units with Credit, Distinction or High Distinction grades. Perhaps these students were not motivated when they came to sit the PELA assessment or did not take the assessment seriously when it was run at such an early stage of semester. Receiving feedback from the AESC that they have to attend the academic workshop was perhaps strong motivation for them to apply themselves to their study.

Having monitored the performance of Health Science students longitudinally over 4 years we can conclude that the School’s intervention by making attendance to academic workshops mandatory has contributed in some way to improve academic performance and student success and retention. The data in Fig. 5 shows that those students who fall below the benchmark for PELA reading have experienced lower failure rates in units and lower withdrawal rates over the last 3 years. In addition for those students who entered university in 2012 this has translated to a higher rate of graduation from Health Science courses and this has continued for 2013 and 2014.

In 2013 the School of Health Sciences began to implement a range of additional FYE activities that were run prior to the start of Semester 1 during Orientation Week. These activities included the First Year Plunge, and a separate School of Health Sciences Activities Day that was organised and ran by staff and senior students from the School. The aim was to enable first year students to get to know other students in their year group and senior students before they commenced their study and they would know a few familiar faces on campus at the start of the semester. In 2014 the School established a Health Sciences Student Social Club 46 that is run by senior students. The Club organises a range of social activities for Health Science students through the year, they also distribute a regular newsletter and have a social media site. Since 2013 the University has also begun to run a number of activities that are targeted specifically for Secondary school students. These events allow year 11 or 12

students to spend a day on campus attending seminars and activities so they can experience what it is like to be a student on campus. Each School runs their own School Symposia to highlight the teaching and research activities specific to the School and relate it to information taught within the student's secondary school curricula and they can learn about career paths that are available. Collectively these types of activities equate to the second and third generation FYHE approaches that are proposed by Nelson & Clark (2014).

Much of the FYHE research has focused on the vertical transition of students i.e. the transition from School to University as noted by Gale & Parker (2014) and although this is vital period of adjustment that can influence university success, it is not the only transitional period experienced by students. As students progress through each year of their degree they should learn the skills to cope with the increased rate of learning and also heightened expectations for student performance (e.g. students will undertake more substantial assessments over time, and expectations of citing primary research, demonstrating wider-reading becomes the norm). It is also during this period that students are learning to 'become somebody' (e.g. a scientist, a teacher, a community health worker or outdoor recreation specialist) (Ecclestone, et al 2010).

Although the turnaround in academic performance of first year Health Science students cannot be linked to a single activity or intervention, it does show that the implementation of a range of FYE activities has benefited Health Science students over the long term. Few universities have enforced attendance to academic support courses, even when the results indicate its necessity. But forced attendance is not guaranteed to lead to active student engagement with the learning materials. Individual interventions (such as the "Success Plan" model) have proven highly effective and lead to student engagement and have altered a student's likely trajectory (McNaught, 2014).

Conclusion

Success at tertiary education requires a level of academic self-discipline that is characterised by specific behaviours such as displaying self-motivation, an ability to stay on task, remain focused, and to persevere. Tertiary students need to master these skills to be an independent learner. Although many students may not display these attributes when they commence their studies, they can learn them from their teachers or by observing the performance and behaviour of their peers. It has been noted that consistently, Health Science students at this university are reluctant to seek out academic support voluntarily, even when they know they are struggling. The staff of the School of Health Sciences responded positively once faced with the gravity of the situation observed with the 2011 cohort and worked with staff of the AESC to implement change. The policy change has led to the reduction in the number of failed units by first year students and a reduction in student attrition from Health Science courses in 2012 - 2014. The outcomes of the 2011 cohort resolved the staff to embrace changes to the FYE approaches within the School to help better facilitate student transition from school to university.

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