
Available from Deakin Research Online:

http://hdl.handle.net/10536/DRO/DU:30041233

Reproduced with the kind permission of the copyright owner.

Copyright: 2011, World Business Institute Australia
Does size really matter:
An investigation into student engagement in an Australian university.

E J McElvaney, L Morris, R Arambewela and G Wood

Past literature appears to support the predominant influence of the class size effect on learning, though some findings are mixed and inconclusive. Based on an analysis of student grades and student evaluations in metropolitan, regional and rural campuses of an Australian university, this study investigates the impact of class size on student engagement and student performance. Contrary to the accepted view that higher entry level scores result in higher grades and, conversely, lower entry level scores result in lower grades, the findings suggest that factors other than entry level scores, contribute to student outcomes and student engagement. The study reveals that student satisfaction of teaching quality is higher in the rural and regional campuses where the cohorts are smaller than at the metropolitan campus. This may be an indication that class size seems to have a predominant influence on student engagement and learning outcomes.

Field of Research: Student engagement

Key words: Class size, Student engagement, Student performance, Learning environment

1. Introduction

This study investigates the impact of the size of classes on student outcomes in an Australian university (The University) that has three campuses; a metropolitan, a regional and a rural campus. The genesis of the research was the ongoing debate among academics whether there is a correlation between entry level scores (ENTER) and student performance. The accepted view was that higher entry level scores (ENTER) result in higher grades and, conversely lower ENTER scores result in lower grades. However further evidence suggests that factors other than ENTER scores could be responsible for student outcomes and one of these factors was identified as the class size.

1.1 Background

This research was undertaken in the Business Faculty of The University. Students undertake nine core units, available on and off campus, as part of their Bachelor of Commerce degree. Each unit has a common curriculum taught on all campuses with identical assessment across all campuses. Core units in Metro are extremely large
with cohorts of over 500 students. The unit coordinator is often the unit chair and has
the responsibility of designing the course guide, web site for learning (similar to
WebCT), assignments, examinations, marking guides and all other administration
details to do with teaching staff, other campuses, students and partner institutions
which are also delivering the same unit. Often, these administration roles necessitate
the academic being able to take only some lectures and possibly no tutorials. The
teaching staff in core units at Metro can be made up of 10 or more full time and part
time teaching staff. Communication from the coordinator to the large teaching staff
and then down to the student can be difficult at times. Since The University provides
a large range of online resources, anecdotally it has been suggested that Metro
campus students are often inclined to use these online teaching resources rather
than attend face to face classes regularly.

In the case of the Regional campus it is usual for students in core units to be taught
by the same academic in all of the lectures, however, since most core units at
Regional have over 200 students, two or three part time tutors are employed to take
tutorials. On the Rural campus classes are small so it is usual for one academic to
teach multiple core units and deliver all lectures and tutorials.

Tran (2008) and Lacina (2002) contend that lecturers with closer interaction and
continuous dialogue with students play a significant role in enhancing student
engagement with their academic studies. These levels of engagement are generally
found in smaller university campuses and smaller classes.
The aim of this research is to assess the validity of the past research findings in
relation to the teaching and learning outcomes of the target university by
investigating whether there is a link between class numbers and student
performance. The research is directed by the following two main research questions.

1. Are there differences in the student grades between different campuses?
2. Is there a relationship between student grades and student feedback on
teaching?

2. Literature Review

The higher education (HE) landscape in Australia has changed dramatically over the
past two decades driven by a number of interrelated factors such as the growth and
diversity of the student population, varying expectations of students of their study
outcomes, the impact of information and communication technology (ICT), increasing
acceptance of the need to prepare students for the global knowledge economy and
above all the competitive nature of the higher education market. Additionally, with
higher education being made available to a greater percentage of the domestic and
international population, today's university classes are increasingly becoming large
and diverse and thus present significant teaching challenges.

One of the major challenges in the current scenario is to maintain uniform academic
standards across all student groups. For example, the academically orientated
students tend to be more engaged with their studies despite the teaching
environment being passive while the "non academic" students would require a more
active learning environment to achieve better learning outcomes (Biggs, 1999).

Following an analysis of the impact of class size on student achievement, Glass and
Smith (1979) conclude that there is a significant relationship between class size and
student achievement and smaller classes provide better learning outcomes. In contrast, large classes with limited teacher and peer interactions, high level of student anonymity, and didactic teaching, produce low motivation and engagement among students (Glass and Smith, 1979). Similarly, Nye et al (2001), based on a four year project in the US, report that students in smaller classes are more engaged and perform better than in larger classes.

Gilbert (1995) contends that what is going on in the classroom is more important for student learning than the size of the class. His research indicates that class size had only a minimal effect on higher order reasoning and motivation of students and no effect at all on student grades. Blatchford and Mortimore (1994) support this view as they found no consistent evidence to suggest that learning outcomes are linked to class size. Some early researchers, while acknowledging the challenges of teaching in large classes stress that learning outcomes are based on a complex number of factors such as instructor effectiveness (Gilbert 1995), learning-centred campuses (Barr and Tagg 1995) class room techniques (Kezar, 2000) and student approaches to learning and engagement to tasks (Biggs, 1999).

Researchers also agree that the learning outcomes are based on a complex number of factors such as student characteristics (ability, career expectations), teaching related factors (curriculum, methods of teaching and assessing) and student approaches to learning and engagement to tasks (Biggs, 1999, Lizio et al 2002, Devlin et al 2009). Devlin et al (2009) view teaching quality as multidimensional and that the institutional environment plays a major role in teaching quality and student learning outcomes.

While there is debate on what kind of teaching encourages effective learning (Biggs 2003), there is strong agreement among some researchers that teaching which enhances positive student engagement in learning is a major determinant of high quality learning outcomes (ACER, 2008). According to the findings of the Australian Survey of Student Engagement (AUSSE), student engagement encompasses aspects of teaching as well as “broader student experience, learners’ lives beyond university and the institutional support” (AUSSE 2010, p3).

AUSSE measures student engagement on six criteria – Academic Challenge, Active Learning, Student and Staff Interactions, Enriching Educational Experiences, Supportive Learning Environment and Work Integrated Learning.

Devlin et al (2009) argue that the nature and the degree of student engagement are largely dependent on the capacity for universities and staff to create an environment in which students are involved in constructing their own learning. Such involvement by students will lead to active participation in lifelong learning opportunities after graduation and acquisition of skills, tools and experience that could be used to enhance career opportunities in the knowledge economy (Chalmers, 2007). Issues such as quality and innovative teaching, student feedback, curricula and assessment practices, use of technology and institutional support are part of the reform agenda of universities to sustain a learning environment where students are engaged in their learning (Devlin et al., 2009). Good learning outcomes are therefore the result of quality teaching and the learning environment that students experience in universities.
3. Methodology

The research sought to examine nine core units of the Bachelor of Commerce degree offered by The University using quantitative data obtained from The University.

The study investigated three areas:

- The number of students who responded to (Student Evaluation of Teaching Units (SETU)) requests as a percentage of the total campus cohort.
- The academic results of students by unit/campus and their ENTER scores.
- A comparison of campus academic results with the SETU findings to determine if there are correlations between the size of the cohort and student engagement and outcomes.

The study concentrated on identifying whether student engagement differs across different cohorts at the Metro, Regional and Rural campuses. The base data used was:

1. The SETU information from Trimester 1 of 2008, 2009 and 2010. Students were asked to rank their agreement of comments. The specific areas of analysis from this data were:
   - Question 1. This unit was well taught.
   - Question 5. The teaching staff gave me helpful feedback and
   - Question 7. I would recommend this unit to other students.

2. ENTER scores which are publically available and identify specific entry level scores for Metro, Regional and Rural for 2008 -2010.

3. Academic results. Overall student results were obtained from The University. Data was aggregated for anonymity and there were no student identifiers, hence no ethics approval was required.

The following hypotheses were tested in the study.

1. \( H_0 \) - The distribution of grades is independent of campus.
   \( H_1 \) - The distribution of grades is dependent on campus

2. \( H_0 \) - There is no relationship between the SETU response rate and the campus.
   \( H_1 \) - There is a relationship between the SETU response rate and the campus.

All data was collected in SPSS and Excel format for analysis.

Limitations

Small class sizes at Rural make it difficult to generalise results, however they can provide indicative results. A further limitation is the mix of students. Metro has a large International population and for many, English is not their first language. Both Regional and Rural have a low percentage of international students.
4. Results and Discussion

4.1 Student Grades across Campus

With regard to the impact of the campus size on student performance (Grades), results indicate that there is a significant relationship between campus and grades (p-value <0.05) (see Table 4.1 & 4.2). Rural appears to have a more even distribution of grades and a higher percentage of Higher Distinction grades (HD) whereas the other campuses have a higher percentage of credit grades(C) relative to the remaining grades. Rural has a higher percentage of HDs and fails (N) whereas Metro and Regional have a higher percentage of Cs. Therefore the null hypothesis is rejected and alternate hypothesis accepted; the distribution of grades is independent of campus.

Table 4.1: Campus and student Grades- Cross tabulation

<table>
<thead>
<tr>
<th>Campus Location</th>
<th>HD</th>
<th>D</th>
<th>C</th>
<th>P</th>
<th>N</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metropolitan count</td>
<td>1709</td>
<td>3769</td>
<td>4780</td>
<td>3910</td>
<td>2985</td>
<td>17153</td>
</tr>
<tr>
<td>Metropolitan Percentages</td>
<td>10.0%</td>
<td>22.0%</td>
<td>27.9%</td>
<td>22.8%</td>
<td>17.4%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Regional count</td>
<td>503</td>
<td>895</td>
<td>1144</td>
<td>905</td>
<td>816</td>
<td>4263</td>
</tr>
<tr>
<td>Regional Percentages</td>
<td>11.8%</td>
<td>21.0%</td>
<td>26.8%</td>
<td>21.2%</td>
<td>19.1%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Rural count</td>
<td>108</td>
<td>158</td>
<td>191</td>
<td>177</td>
<td>173</td>
<td>807</td>
</tr>
<tr>
<td>Rural Percentages</td>
<td>13.4%</td>
<td>19.6%</td>
<td>23.7%</td>
<td>21.9%</td>
<td>21.4%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Total count</td>
<td>2320</td>
<td>4822</td>
<td>6115</td>
<td>4992</td>
<td>3974</td>
<td>22223</td>
</tr>
<tr>
<td>Total Percentages</td>
<td>10.4%</td>
<td>21.7%</td>
<td>27.5%</td>
<td>22.5%</td>
<td>17.9%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Grade data provided is based on all first trimester on campus units associated with Bachelor Commerce core units. Average percentage distributions aggregated over all first trimester first year units 2008 to 2010 comprising the Bachelor Commerce course.

Table 4.2: Campus and Student grades - Chi-Square Tests

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>42.565&lt;sup&gt;a&lt;/sup&gt;</td>
<td>8</td>
<td>.000</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>22223</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.2 Student Grades and SETU data

**Grade data** is based on all first trimester on campus core units associated with Bachelor Commerce units. Average percentage distributions taken over the three individual years with yearly data aggregated over all first trimester first year units comprising the Bachelor Commerce course.

**SETU results** were obtained for the unit level, on campus Bachelor Commerce units. The Average was taken over the three individual years with yearly data aggregated over all units.

As Figure 4.1 indicates, the average score for SETU Question 1 distinctly improves when moving from Metro to Regional to Rural campuses, indicating that students are likely to be more satisfied with the teaching and the feedback they receive from their teachers in the Rural and Regional campuses where the cohorts are smaller, than at Metro campus.

![Fig 4.1 Student Grades and SETU data](image)

4.3 SETU Response Rate and Campus –

In determining whether there are significant differences in the response rates of students to the SETU at the three campuses, results indicate that a significant relationship does exist between campus and the SETU response rate (with a p-value of 0.000) as shown in Tables 4.3 & 4.4 (below). The Rural campus has a higher response rate than the Regional campus and Regional campus has a higher response rate than the Metro campus. As a result, the alternative hypothesis; there is a relationship between the SETU response rate and the campus, is accepted.
Table 4.3: Campus * Response Cross tabulation

<table>
<thead>
<tr>
<th>Campus Location</th>
<th>Didn’t respond to evaluation request</th>
<th>Did complete evaluation survey</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metropolitan</td>
<td>11355</td>
<td>5798</td>
<td>17153</td>
</tr>
<tr>
<td>Metropolitan Percentages</td>
<td>66.2%</td>
<td>33.8%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Regional</td>
<td>2374</td>
<td>1889</td>
<td>4263</td>
</tr>
<tr>
<td>Regional Percentages</td>
<td>55.7%</td>
<td>44.3%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Rural</td>
<td>408</td>
<td>399</td>
<td>807</td>
</tr>
<tr>
<td>Rural Percentages</td>
<td>50.6%</td>
<td>49.4%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Total</td>
<td>14156</td>
<td>8067</td>
<td>22223</td>
</tr>
<tr>
<td>Total Percentages</td>
<td>63.7%</td>
<td>36.3%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Table 4.4: Chi-Square Tests

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>198.741*</td>
<td>2</td>
<td>.000</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>22223</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The average response rate to the SETU questionnaire also improves progressively from the Metro to the Regional then to the Rural campuses. It does appear from Figure 4.2 (below) that the smaller the campus the better the response rate. Anecdotal evidence suggests that the response rate is a good indicator of student attendance and engagement rates in lectures and tutorials. If this is the case, then the results indicate that in 'Face To Face' teaching situations, students on the Rural Campus are the most engaged and that Regional students are more engaged than Metro students.
4.4 Average responses to SETU Q1, ENTER scores and Q1 Results

The chart below demonstrates the clear improvement in the SETU survey feedback for question one (Q1) as well as increased response rates as one moves from the Metro to the Regional to the Rural campuses. In contrast the average Median ENTER of the past three years for the Bachelor of Commerce declines by virtually 10 points as one moves from the Metro to the Regional and Rural campuses.

The higher response rates and higher satisfactions rates with the quality of their teaching at country campuses indicates that even with lower enter scores, students can be still be successfully engaged in their learning process.
4.5 Average Median ENTER by Campus and Grades

Figure 4.4 (below) shows the Median ENTER scores attained by those commencing the Bachelor of Commerce course at Metro, Regional and Rural. The Median ENTER scores are 82 (Metro), 72 (Regional and 62 (Rural). Despite having ENTER scores 20 points less than Metro, Rural High Distinctions (HDs) are 6 points higher than at Metro and 3 points higher than Regional.
4.6 Average SETU results by Question, Response Rate and Campus.

Figure 4.5 consolidates the three key SETU questions' results and Average SETU response rate by campus. It demonstrates the improved SETU results and response rates as one moves from the Metro to Regional to Rural campuses. Not only do students at Rural have a higher rating than both Metropolitan and Regional on Q1 (the unit was well taught) but also Q 5 (the teaching staff gave me useful feedback). Q7 (I would recommend this unit to others) showed little difference between Metro and Rural with Regional recording the highest response rate for this question.
4.7 Summary

According to Gilbert (1995) the effect of class size is more relevant to first year undergraduates who are in need of greater personal attention during the early stages of transition to higher education environment. This research supports Gilbert's (1995) findings. Students at Rural and Regional campuses with smaller class sizes are more likely to have closer relationships with staff. As a result of this closer contact with staff, students are more likely to achieve higher grades than their ENTER scores would indicate, they are more likely to be engaged, readily respond to unit evaluation surveys and be more satisfied overall with the quality of their teaching.

5. Conclusions and Recommendations

This research sought to determine if there were differences in respect to the size of class and student engagement with the education process. Anecdotal evidence suggested that there might be some validity to the belief that smaller class sizes produce not only greater engagement but that Regional and Rural students might appreciate and value their classes more so than their Metro counterparts.

The comparative analysis of this research data confirmed this belief. The results suggest that as one moves from the larger classes of the metropolis to the more intimate regional and rural classes, students tend to respond better to the educational experiences that they receive. This is evidenced by higher than expected academic results, higher student engagement in the unit evaluation process and satisfaction with the quality of the teaching.

The small numbers of students at the Rural campus is a limitation of this research, making it difficult to generalise findings. However it appears that in respect to SETU responses the further from the Metro campus one is educated, the more students
appear to value the educational experiences provided. Further research is required
to determine whether these findings are consistent across other universities and
what other factors might affect student engagement and outcomes.

References


Devlin, M., Brockett, J & Nichols, D 2009, Focussing on university student engagement at the institutional level, Journal of Higher Education Policy and Management, 31 (2) 109-119

Gilbert, A. 1995, Quality Education: Does class size matter?, CSSHE Professional File, No. 14:1-7, Association of Colleges and Universities in Canada,


Ramsden, P 2008, The Future of Higher Education Teaching and the Student Experience, unpublished paper presented to the UK government on educational reforms. Is this all the info we have on this?