



An institutional study of the influence of ‘onlineness’ on student evaluation of teaching in a dual mode Australian university

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Student evaluation of teaching (SET) is now commonplace in many universities internationally. The most common criticism of SET practices is that they are influenced by a number of non-teaching-related factors. More recently, there has been dramatic growth in online education internationally, but only limited research on the use of SET to evaluate online teaching. This paper presents a large-scale and detailed investigation, using the institutional SET data from an Australian university with a significant offering of wholly online units, and whose institutional SET instrument contains items relating to student perceptions of online technologies in teaching and learning. The relationship between educational technology and SET is not neutral. The mean ratings for the ‘online’ aspects of SET are influenced by factors in the wider teaching and learning environment, and the overall perception of teaching quality is influenced by whether a unit is offered in wholly online mode or not.

Keywords: student evaluation of teaching, wholly online mode, class size, year level, discipline difference

Introduction

Student evaluation of teaching (SET) has a long history, has grown in prevalence and importance over a period of decades, and is now commonplace in many universities internationally (Davies, Hirschberg, Lye, Johnston & McDonald, 2007; Denson, Loveday & Dalton, 2010; C. Smith, 2008). SET data are collected for a range of purposes, including: as diagnostic feedback to improve the quality of teaching and learning; as an input to staff performance management processes and personnel decisions; to provide information to prospective students in their selection of units and programs; and as a source of data for research on teaching (Marsh & Roche, 1993). While the use of SET data may have originally been collected for primarily formative purposes to improve teaching and learning (Rovai, Ponton, Derrick & Davis, 2006), it is also increasingly used for summative judgements of teaching quality and teaching staff performance that may have implications for personnel decision making (Neumann, Gosper & Adams, 1997). The increasing use of SET for high-stakes decision making puts pressure on institutions to ensure that their SET practices are sound and defensible (Neumann, 2001).

The most common criticism of SET practices is that they are biased, and influenced by a number of non-teaching-related factors (Al-Issa & Sulieman, 2007). Rovai et al. (2006) report that while much SET research provides mixed results, there is some evidence that smaller classes are rated more favourably than large classes, that upper year-level classes are rated more favourably than lower-year classes, and that there is rating

differences between discipline areas. While additional course-related factors are also noted, other reviews of the literature on SET also identify these three factors as commonly reported systematic influences on SET ratings (Davies et al., 2007; Neumann et al., 1997). One common approach to dealing with the perception that certain factors systematically influence SET ratings is the provision of what are known generically as rating interpretation guides (RIGs). Although the specifics of various RIGs-style systems vary, the essential element is the provision of a norm-based set of benchmarks for the 'fair' ranking or comparison of SET results. These benchmarks are based on a set of units of study that are similar in certain relevant respects – typically class size, class year level and discipline grouping – to the target unit (Lemos, Queirós, Teixeira & Menezes, In print; Neumann, 2001; C. Smith, 2008).

In more recent times there has been dramatic growth in online education internationally that continues to this day (Allen & Seaman, 2010; Loveland, 2007; Mayadas, Bourne & Bacsich, 2009). Rovai et al. (2006) note that much of the published research on SET relates to traditional classroom settings, and in an analysis of qualitative SET data (student written comments) they found a significant difference between the responses of students completing a wholly online version of a course compared to students completing an on-campus version of the same course – online students gave a more negative rating. They also note the limitation of a qualitative-only investigation of SET ratings, and call for additional research using other investigative methodologies. Likewise, Loveland (2007) notes the lack of research on the use of SET to evaluate online teaching, provides a study indicating significantly lower SET ratings for online classes compared to on-campus classes, and calls for additional research in this area. For many universities, programs and individual teachers, online learning is a crucial element of their activities. This paper presents a large-scale and detailed investigation, using the institutional SET data from an Australian university with a significant offering of wholly online units, and whose institutional SET instrument contains items relating to student perceptions of online technologies in teaching and learning. This paper seeks to identify those factors, if any, that influence student perceptions of online technologies in teaching and learning, and to identify the influence, if any, that wholly online mode of offer has on SET ratings generally.

The Deakin University context

Deakin University is an Australian university that is a major provider of distance and online education. In addition, it teaches on-campus at four campuses located in three cities in the State of Victoria, with campuses spanning metropolitan, regional and rural locations. Deakin University currently teaches on a trimester system, with three teaching periods per year of equal duration and status. In total, approximately 39,600 students are enrolled in studies (Deakin University, 2011). As part of an institutional commitment to expand online teaching and learning, Deakin University introduced a policy that required that, '[f]rom 2004, all students commencing a Deakin Bachelor degree course shall undertake and pass at least one wholly online unit, unless exempted by the Chair of Academic Board' (Deakin University, 2003). Wholly online is defined as: all content online; all communication and interaction online; assignment submission and feedback online; and employing online interactive communications. As a result of this policy, Deakin University offers a significant number of wholly online units across different year levels of programs in different discipline areas. Deakin University also has an 'Evaluation of Teaching and Units' procedure (Deakin University, 2009) that requires that, unless a case is made for exemption, Deakin University's student evaluation of teaching and units (SETU) questionnaire is administered to students enrolled in a unit of study every time it is offered. This means that a large volume of SET data is collected annually at Deakin University.

The SETU instrument, as a standardised, centrally administered questionnaire, was first introduced in 2003, and its current form was introduced in 2006, with item 10 added in 2010. It consists of ten core items:

This unit was well taught.

The course materials in this unit were of high quality.

The workload in this unit was manageable.

Requirements for completing the assessment tasks in this unit were clear.

The teaching staff gave me helpful feedback.

The library resources met my needs for this unit.

I would recommend this unit to other students.

The technologies used to deliver the online content in this unit performed satisfactorily.

The on-line teaching and resources in this unit enhanced my learning experience.

This unit challenged me to learn.

SETU respondents rate each core item on a five point scale (1=strongly disagree; 2=disagree; 3=neutral; 4=agree; 5=strongly agree) with a 'not applicable' option included.

Following the completion of the SETU survey period and collation of results, SETU data are reported via a public website; anyone with an interest can query the results for the ten core SETU items, based on a selection of evaluation period, faculty, school, unit and student enrolment location. The data reported for a unit include total enrolment, total number of responses and computed response rate for the enrolment location(s) selected, and, for each of the ten core SETU items, number of responses, mean rating, standard deviation of the mean rating, percentage agreement, percentage disagreement and percentage difference. SETU results are publicly reported for a unit unless the number of responses is less than ten; the presumption being that anything less than ten responses is an unrepresentative sample size.

Methodology

Mean ratings for the ten core SETU items for all units reporting data via the Deakin University SETU web site were collected for the whole year period, including trimester 2 2009, trimester 3 2009/2010 and trimester 1 2010. Based on the systematic coding convention used for identifying units of study at Deakin University, it was possible to identify the nominal year level and the 'owning' Faculty (used as a proxy for broad discipline area) for each unit and add these data to the data record for that unit. Using the Deakin University online unit handbook (Deakin University, 2010), it was possible to identify all units of study offered in wholly online mode and add this data to the data record for each unit.

For each of the three commonly identified factors that influence SET ratings (class size, year level and discipline area), an analysis of variance (ANOVA) was undertaken to identify and quantify any significant systematic variation in the mean ratings for the two SETU items related to 'onlineness' (items 8 and 9). Additionally, using online mode of offer, an ANOVA was undertaken to identify any systematic variation in the mean ratings for all ten SETU items. Pearson's correlation coefficient was used as a measure of the effect size for any observed systematic influences. In all statistical analyses, the significance level used was $p < 0.01$. A discussion of the observed results is also presented.

Results and Discussion

General

The data extracted from the SETU reporting web site and used in the analysis here included mean rating sets for 1432 units of study, and represented 74498 sets of SETU ratings, 188391 individual student enrolments and 58.5 percent of all units listed in the Deakin University handbook for the period under consideration.

SETU items relating to 'onlineness'

Deakin University's SETU instrument contains two items directly related to students' experiences of online technologies in their studies, namely:

Item 8 – The technologies used to deliver the online content in this unit performed satisfactorily; and

Item 9 – The on-line teaching and resources in this unit enhanced my learning experience.

Drawing on research that applies information systems models of user acceptance of technology in educational contexts (Lin, 2007; Roca, Chiu & Martínez, 2006), there is strong evidence that learner satisfaction with (and hence acceptance of) an online learning system is directly related to the perceived quality of the service and the system, and that system reliability is an important determinant of such user perceptions. Support was found here for this proposition in a strong, significant and positive correlation between mean ratings for SETU items 8 and 9. The observed Pearson linear correlation coefficient was $r = 0.855$ ($r^2 = 0.730$; $p = 0.0000$). This was the third highest of all SETU inter-item correlations observed. This observed correlation is visualised in Figure 1 showing mean SETU rating for item 8 versus mean SETU rating for item 9. One implication of this finding is that a high level of reliability for an online learning system is a prerequisite for student satisfaction with the system and perception of its value in enhancing learning.

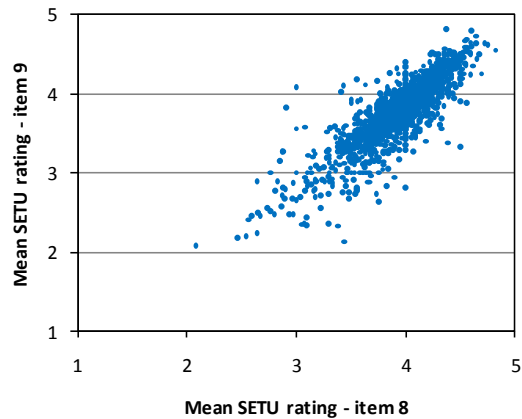


Figure 1: Scatter plot of mean SETU ratings for item 8 and item 9

Class size

For classroom-based teaching, it has been suggested that class size may influence the teaching approach used by a teacher and/or impact on the amount of personal communication or attention that a teacher can give to any particular student (Adams, Neumann & Rytmeister, 1996; Centra & Gaubatz, 2000), both having a consequent negative impact on student perceptions of teaching (and SET ratings) as class size increases. The officially recorded unit enrolment was used here as a proxy measure for class size; acknowledging that this is the nominal class size, which may vary depending on actual class attendances (either physically on-campus or virtually). For the reported Deakin University data under analysis, the unit enrolment varied from 12 to 1648, with the majority of units falling under 100 enrolments, and very small numbers of units with enrolments above 500. If the units are rank ordered by enrolment and divided into three groups, the break points occur at enrolments of 50 and 105. For convenience, the nominal class size groupings of <51, 51-100 and >100 were selected. For SETU items 8 and 9, a one-way ANOVA was attempted for the mean rating as the dependent variable against class size grouping. For both SETU items Levene’s test of homogeneity of variance failed, so a robust ANOVA test using the Welch test statistic was performed instead. No significant difference in mean SETU rating between class size groupings was observed for SETU items 8 and 9. Table 1 presents a summary of the statistical test results. Figure 2 shows the mean SETU ratings of the three class size groupings for SETU items 8 and 9. Note that compressed vertical scales are used and 95 percent confidence intervals are estimated.

Table 1: Relationship between SETU items 8 and 9 and class size grouping

| SETU item | Test statistic | Significance | Effect size |
|-----------|----------------|--------------|-------------|
| Item 8 | $F = 0.885$ | $p > 0.41$ | n/a |
| Item 9 | $F = 3.199$ | $p > 0.041$ | n/a |

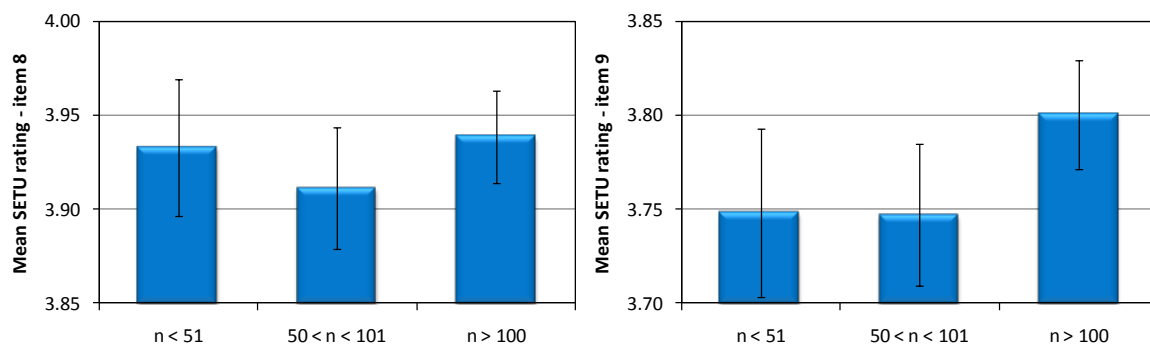


Figure 2: Mean ratings for SETU items 8 and 9 by class size grouping

Given that how an individual student experiences the performance of online technologies is essentially independent of the size of classes they are enrolled in, it is not surprising that the mean rating for SETU item 8 was observed to be independent of class size. It was also observed that the mean rating for SETU item 9 was

not significantly related to class size. Drago & Peltier (2004) note that while the influence of class size on perceived course effectiveness for traditional courses is well researched, there is little research on this association for online courses. In a survey of 1126 MBA students from both conventional and online courses, they found a significant negative association between perceived overall course effectiveness and class size for traditional courses, but no such association for online courses (Drago & Peltier, 2004). They propose that the reason for this is that, either intrinsically or due to the development of educational technologies, many of the factors that contribute to perceived course effectiveness (including: course content; instructor support; course structure; instructor-student interaction; and student-student interaction) are essentially independent of class size for online courses. While the investigation here related to student SETU ratings of the online aspects of units (regardless of whether they are actually offered in face-to-face, blended or wholly online mode), it is believed that the same essential reasons might lead to class size grouping having no significant impact on the mean SETU ratings for items 8 and 9. While it beyond the scope of the investigation presented here, it is noted that the mean SETU ratings for some non-online-related SETU items (3, 5, 7 and 10) all exhibited a significant and negative association with class size grouping.

Year level

In the general SET literature, year level is often identified as a systematic and positive influence on SET ratings (C. Smith, 2008). The duration of undergraduate programs varies between the disciplines, with three years common in the general arts and sciences, but four or five years common for many professional programs. In addition to undergraduate programs, there are also many postgraduate programs. To accommodate for the variation in program duration, year level groupings of ‘early years’ (first and second years), ‘later years’ (third and later years) and ‘postgraduate’ (programs beyond undergraduate level) were employed. For SETU items 8 and 9, a one-way ANOVA was attempted for the mean rating as the dependent variable against year level grouping. For both SETU items Levene’s test of homogeneity of variance failed, so a robust ANOVA test using the Welch test statistic was performed instead. A significant difference in mean SETU rating between year level groupings was observed for SETU items 8 and 9. Table 2 presents a summary of the statistical test results and a measure of effect size based on Pearson’s correlation coefficient (*r*). Figure 3 shows the mean SETU ratings of the three year level groupings for SETU items 8 and 9. Note that compressed vertical scales are used and 95 percent confidence intervals are estimated.

Table 2: Relationship between SETU items 8 and 9 and year level grouping

| SETU item | Test statistic | Significance | Effect size |
|-----------|----------------|------------------------|-------------|
| Item 8 | $F = 8.972$ | $p < 0.0002$ | $r = 0.096$ |
| Item 9 | $F = 16.515$ | $p < 1 \times 10^{-7}$ | $r = 0.132$ |

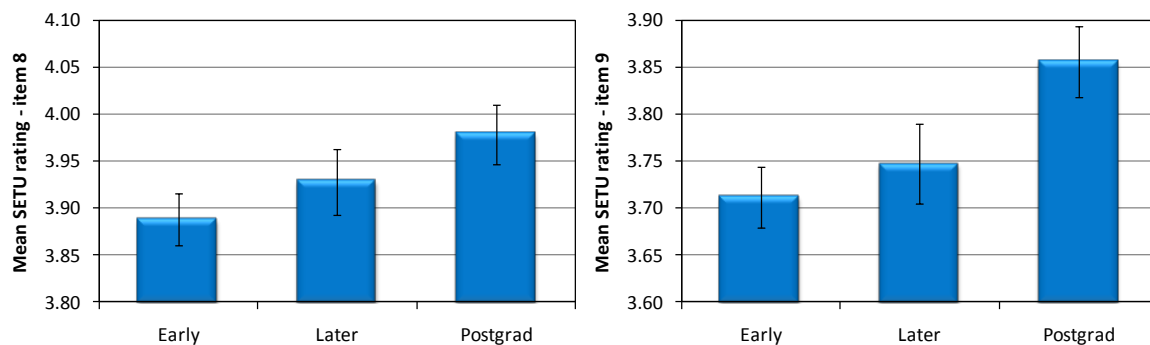


Figure 3: Mean ratings for SETU items 8 and 9 by year level grouping

It has been suggested that the commonly observed positive association between year level and SET ratings is related to student maturity, and that after several years at university, older students have more realistic expectations of their university experience (Denson et al., 2010) or, at least in some discipline areas, students become more independent in their learning in the later years of their study (Adams et al., 1996). More realistic/pragmatic expectations about the performance of online technologies in the support of teaching and learning could account for the differential mean ratings observed for SETU item 8. In an online learning environment (OLE) survey of 822 health science students, respondent age was found to be positive predictor for student attitudes to computers, both generally and in relation to education (Brown et al., 2010). With an

increase in mature age and other ‘non-traditional’ students in undergraduate programs over time, the relationship between age and year level of study is perhaps less clear than it once was. However, Brown et al. (2010) posit that by the third and fourth years of their education, students will have had more exposure to e-learning, and that this may contribute to positive attitudes toward e-learning in older students. The findings here suggest that early years students will benefit from training and other support in how to use online learning technologies that are relevant to their studies.

Discipline area

There is evidence of systematic differences in general SET ratings between different discipline areas (Neumann, 2001; C. Smith, 2008), as well as evidence that different discipline areas use and value specific aspects of OLEs differently (Novell, Jaén & Bohigas, 2004; G. G. Smith, Torres-Ayala & Heindel, 2008; Woods, Baker & Hopper, 2004). Deakin University is currently structured around four academic faculties, each composed of a number of schools, and housing a range of relatively cognate discipline areas:

- Faculty of Health – Medicine, Nursing and Midwifery, Psychology, Exercise and Nutrition Sciences, and, Health and Social Development;
- Faculty of Arts and Education – Communication and Creative Arts, Education, History Heritage and Society, and, International and Political Studies;
- Faculty of Business and Law – Business, Accounting Economics and Finance, Management and Marketing, Information Systems, and, Law; and
- Faculty of Science and Technology – Architecture and Building, Engineering, Information Technology, and, Life and Environmental Sciences.

These existing faculty-based groupings offer a rational and reasonable natural categorisation for the grouping of disciplines offered at Deakin University. For SETU items 8 and 9, a one-way ANOVA was attempted for the mean rating as the dependent variable against discipline grouping. For both SETU items Levene’s test of homogeneity of variance failed, so a robust ANOVA test using the Welch test statistic was performed instead. A significant difference in mean SETU rating between discipline groupings was observed for SETU items 8 and 9. Table 3 presents a summary of the statistical test results and a measure of effect size based on Pearson’s correlation coefficient (*r*). Figure 4 shows the mean SETU ratings of the four discipline groupings for SETU items 8 and 9. Note that compressed vertical scales are used and 95 percent confidence intervals are estimated.

Table 3: Relationship between SETU items 8 and 9 and class discipline grouping (Faculty)

| SETU item | Test statistic | Significance | Effect size |
|-----------|----------------|-------------------------|-------------|
| Item 8 | $F = 11.998$ | $p < 2 \times 10^{-7}$ | $r = 0.137$ |
| Item 9 | $F = 21.177$ | $p < 4 \times 10^{-13}$ | $r = 0.187$ |

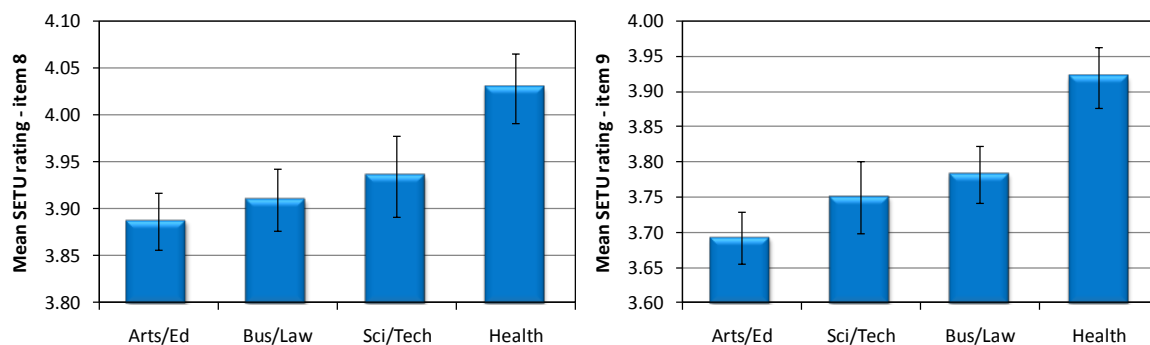


Figure 4: Mean ratings for SETU items 8 and 9 by discipline grouping (Faculty)

Research into the ways of knowing and ways of teaching suggest fundamental differences between discipline areas (Hammond & Bennett, 2002; White & Liccardi, 2006), yet much of the research into online learning seems to assume no influence from discipline context (G. G. Smith et al., 2008). The discipline group differences in SET ratings relating to ‘onlineness’ observed here are in broad agreement with the findings of a UK JISC research project which surveyed students from four different discipline areas and found that students from medical (health) disciplines gave the highest importance rating to e-learning as part of their studies, while language (arts) students gave the lowest rating of importance to e-learning (Conole, de Laat, Dillon & Darby,

2006). Previously at Deakin University it has been observed that students from different Faculties rated significantly differently the importance of, and their satisfaction with, a range of elements of the institutional OLE (Palmer & Holt, 2010). Such a finding supports the observations made here, and challenges the value of standard, one-size-fits-all institutional policies and templates relating to the use of the OLE. The identification of the need for more detailed exploration of the impact of discipline area differences on the user experience of online learning can be found in the literature (Jones & Jones, 2005; Novell et al., 2004; G. G. Smith et al., 2008; Wingard, 2004; Woods et al., 2004).

Interaction between year level and discipline area

The preceding ANOVA analyses suggest that both year level and discipline area have an influence on mean SETU ratings for items 8 and 9. It is worthwhile to test if these effects are independent or, in fact, are due to some underlying relationship between year level and discipline area in the data set under examination. A multi-factor ANOVA test can identify interactions between the grouping variables. For SETU items 8 and 9, a two-way ANOVA was attempted for the mean rating as the dependent variable against both year level and discipline area grouping combined. Table 4 presents a summary of the statistical test results for SETU item 8 and a measure of effect sizes for each item based on partial eta squared (η^2). Table 5 presents a summary of the statistical test results for SETU item 9 and a measure of effect sizes for each item based on partial eta squared (η^2). For both two-way ANOVAs Levene's test of homogeneity of variance failed, but the multi-way ANOVA test is relatively robust to inhomogeneity of variance, as long as there is no correlation between the mean and spread of the dependent variable. For both two-way ANOVAs, plots of mean versus spread showed no correlation, providing confidence in the statistical tests and the results presented in Table 4 and 5.

Table 4: Interaction between year level and discipline area groupings for SETU item 8

| Item | Test statistic | Significance | Effect size |
|-------------------------|----------------|------------------------|------------------|
| Overall model | $F = 5.346$ | $p < 3 \times 10^{-8}$ | $\eta^2 = 0.040$ |
| Year level | $F = 9.569$ | $p < 8 \times 10^{-5}$ | $\eta^2 = 0.013$ |
| Discipline | $F = 11.136$ | $p < 4 \times 10^{-7}$ | $\eta^2 = 0.023$ |
| Year Level x Discipline | $F = 1.673$ | $p > 0.123$ | n/a |

Table 5: Interaction between year level and discipline area groupings for SETU item 9

| Item | Test statistic | Significance | Effect size |
|-------------------------|----------------|-------------------------|------------------|
| Overall model | $F = 8.686$ | $p < 5 \times 10^{-15}$ | $\eta^2 = 0.063$ |
| Year level | $F = 15.300$ | $p < 3 \times 10^{-7}$ | $\eta^2 = 0.021$ |
| Discipline | $F = 17.638$ | $p < 4 \times 10^{-11}$ | $\eta^2 = 0.036$ |
| Year Level x Discipline | $F = 1.930$ | $p > 0.071$ | n/a |

For both SETU items 8 and 9 there was no significant interaction observed between the grouping variables year level and discipline area. This provides evidence that these factors influence the mean ratings for SETU items 8 and 9 independently.

Online mode offer

Deakin University offers units of study in on- and off-campus mode (generally with some level of on-line support) and in wholly online mode (with the characteristics described above). While wholly online unit offerings are a minority, there was still a significant number (92) units offered in wholly online mode during the period under consideration. This time, instead of focusing only on SETU items 8 and 9, for each of the 10 SETU items, a one-way ANOVA was attempted for the mean rating as the dependent variable against wholly online status. For one of the ten SETU items (item 5) Levene's test of homogeneity of variance failed; in that case a robust ANOVA test using the Welch test statistic was performed instead. A significant difference in mean SETU rating between wholly online status was observed for only two of the SETU items (item 1 – 'This unit was well taught' and item 7 – 'I would recommend this unit to other students'), and in both cases the rating was significantly lower for wholly online units. Table 6 presents a summary of the statistical test results and a measure of effect size based on Pearson's correlation coefficient (r). Figure 5 shows the mean SETU ratings for conventional and wholly online modes of offer for SETU items 1 and 7. Note that compressed vertical scales are used and 95 percent confidence intervals are estimated, with a small population correction applied to the confidence intervals for wholly online mode of offer.

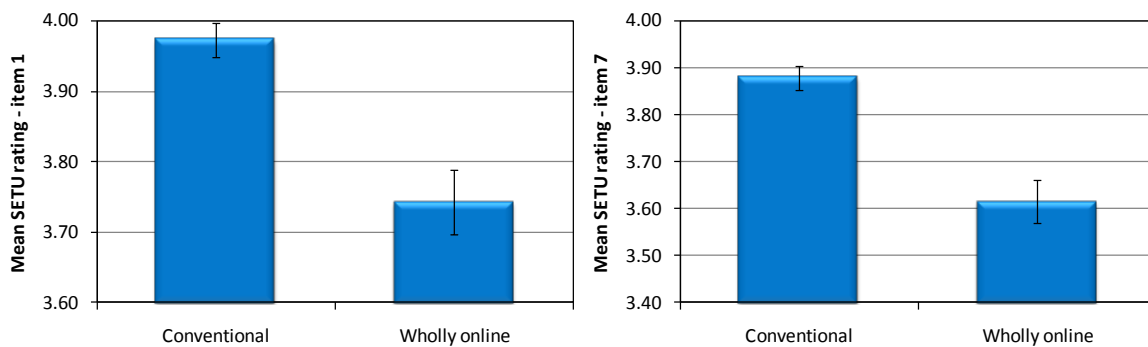


Figure 5: Mean ratings for SETU items 1 and 7 by online mode of offer

Table 6: Relationship between SETU items 1 and 7 and online mode of offer

| SETU item | Test statistic | Significance | Effect size |
|-----------|----------------|------------------------|--------------|
| Item 1 | $F = 18.266$ | $p < 0.0003$ | $r = -0.112$ |
| Item 7 | $F = 22.350$ | $p < 3 \times 10^{-6}$ | $r = -0.124$ |

Here, it is interesting that SETU ratings relating to learning materials, workload, assessment requirements, quality of feedback, academic challenge, etc. were not significantly different for units offered wholly online, but the perception whether the unit was well taught or not was significantly different. This finding seems to indicate that students studying in wholly online mode notice the absence of the ‘teacherly’ aspects of their study – be it face-to-face contact in the classroom, or the hardcopy study guides provided for off-campus students. Rovai et al. (2006) note some evidence in the literature that some students find online study less satisfying than traditional methods.

In a Deakin University context, it has previously been observed that when an existing unit of study (coded as SEB221) offered in both on- and off-campus mode was converted exclusively for wholly online delivery, the SETU ratings generally decreased significantly (Palmer & Holt, 2007). In that case, while the SETU survey instrument had been modified in the intervening period between the different modes of offer, three of the items did not change. The items that appeared in both versions of the SETU instrument during the period in question were items 1, 7 and 9 (based on the numbering employed in the current version of SETU). Figure 6 shows the mean ratings for these three SETU items in the two years prior to conversion to wholly online mode (2003-2004), the year of the first offer in wholly online mode (2005) and the following year (2006). Figure 6 gives the number of SETU respondents and the effective response rate for each year in parenthesis. Note that a compressed vertical scale is used and 95 percent confidence intervals are estimated for the 2006 mean SETU ratings (as complete 2006 SETU data for SEB221 were available to the authors).

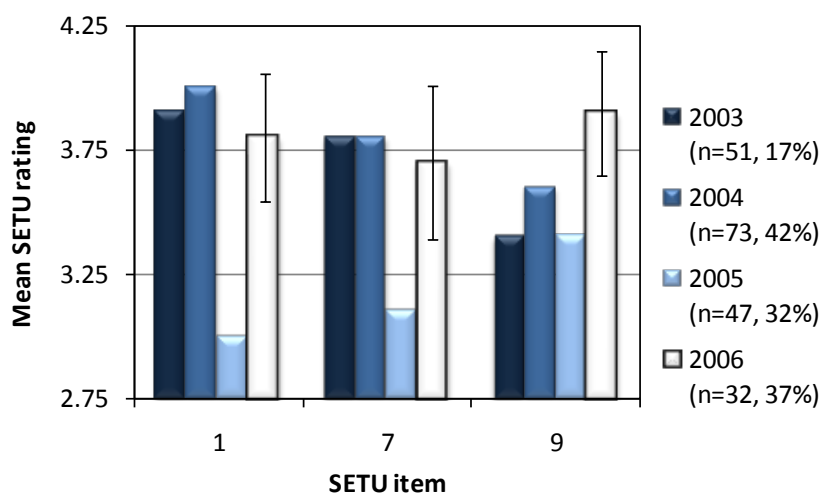


Figure 6: Mean ratings for SETU items 1, 7 and 9 for unit SEB221, 2003-2006

Even though the substantive unit content and the assessment details were not modified in any way, consistent with the influence of wholly online mode of offer noted in Figure 5 above, when the unit was moved to wholly online mode (in 2005), mean ratings for SETU items 1 and 7 declined significantly, while the mean rating for item 9 did not. Following the SETU results obtained in 2005, a small but deliberate change was made to the format of the unit for the 2006 offer to specifically take advantage of the wholly online format to both facilitate interaction between the previously essentially separate on- and off-campus student groups, and to re-introduce a strong teacherly presence in the online space. This intervention appeared to raise the SETU ratings for items 1 and 7 to their pre-wholly online levels, and perhaps even increase the rating for item 6 (see 2006 data in Figure 6) (Palmer & Holt, 2007).

Conclusion

Using the institutional SET data for an entire year from an Australian university with a significant offering of wholly online units, and whose institutional SET instrument contains items relating to student perceptions of online technologies in teaching and learning, it was identified that:

- mean ratings for the two 'online' SETU items (item 8 – 'The technologies used to deliver the online content in this unit performed satisfactorily' and item 9 – 'The on-line teaching and resources in this unit enhanced my learning experience') are strongly, significantly and positively correlated;
- class size had no significant influence on either SETU item 8 or item 9;
- mean ratings for SETU items 8 and 9 are significantly and positively related to the enrolled year level of the respondent, based on the groupings of 'early years' (first and second years), 'later years' (third and later years) and 'postgraduate' (programs beyond undergraduate level);
- mean ratings for SETU items 8 and 9 are significantly different between Faculties – with the Faculty of Health having the highest mean rating for both items, and the Faculty of Arts and Education having the lowest mean ratings for both items; and
- comparing units offered in wholly online mode to units offered in all other modes, mean ratings for SETU items 1 'this unit was well taught' and 7 'I would recommend this unit to other students' were both significantly lower for wholly online units.

It is not possible to conclude whether the relationship observed between SETU item 8 and 9 is causal and/or attributable to a halo effect where respondents do not clearly distinguish between the performance of online infrastructure and the value of online technologies in their learning. What is clear is that there is a strong correlation between the two items, and a poorly performing online learning system is likely to be associated with having a lower value for student learning. More generally, it is clear that the relationship between educational technology and SET at Deakin University is not neutral. The mean ratings for the 'online' aspects of SETU are influenced by factors in the wider teaching and learning environment, and the overall perception of teaching quality is influenced by whether a unit is offered in wholly online mode or not. While the observed effect sizes of the influences are comparatively small ($0.096 \leq r \leq 0.187$), two-way ANOVA analysis shows that those factors that significantly influence SETU items 8 and 9 are independent, and could potentially be additive in some circumstances. All are important in an environment where the first decimal in a mean SETU rating can be the difference between a satisfactory or unsatisfactory evaluation in an academic performance review. In particular, the observed influence of online mode of delivery on mean ratings for SETU items 1 and 7 is significant, as those items are two of the three SETU items (the other being item 9) reported to the University Council as overall teaching quality indicators for a unit of study. Given that the use of online technologies in higher education is likely to increase, as is the interest in the rational use of SET data, our findings here support the proposition that 'onlineness', like other recognised systematic influences on SET data, shouldn't be ignored.

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