Students' evaluations of teaching quality and their unit online activity: An empirical investigation

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This paper reports on an investigation of the relationship between students' level of online activity in units in a business faculty and their evaluations of teaching quality in these units. The analysis was conducted using student evaluation data from 2004 to 2007 together with data for student online activity for one semester. We compare on-campus and off-campus students and undergraduate and postgraduate students. The results indicate that students' evaluations of units have improved on all surveyed criteria during the five years. We also show that for some cohorts student online activity is associated with greater satisfaction with teaching. The paper concludes by considering the implications of these findings for further research and teaching practice.

Keywords: student evaluation, teaching quality, off-campus, online, ICT

Introduction

Asking students to evaluate the teaching in a unit inevitably requires them to consider what teachers 'do' and how well they do it (Goldstein & Benassi, 2006). In on-campus teaching (i.e., of internally enrolled students), teachers are physically present with the student. The teaching activity of lecturers and tutors is largely visible to students and therefore, assessable. This is less true in the case of off-campus teaching in Australia where learning materials have traditionally been delivered to students in hard-copy form and contact between students and teacher has typically been asynchronous and episodic, often focused around feedback about performance on assessment tasks. However, the use of online delivery has led to changes in both the production and delivery of teaching activities. For example, teaching materials can be delivered in real time by the teacher/tutor, teaching can be more direct and obvious for the student and communication is both more extensive and immediate. These changes have served to make teaching activities more visible to off-campus students. As a result, off-campus students should be better positioned to evaluate teaching quality and may experience greater learning benefits. Conceivably, both these factors may result in their higher evaluations of teaching quality.

This relationship between students' evaluations of teaching quality and aspects of the online learning environment they experience in a unit is the subject of this paper. An analysis was conducted using student evaluation data from 2004 to 2007 together with data for student online activity for one semester within the business faculty of an Australian university. The analysis compares both on-campus and off-campus students and undergraduate and postgraduate students.

Literature review

The practice of surveying students to evaluate the quality of teaching is widespread in Australian universities. Graduating students are surveyed through the Course Experience Questionnaire (CEQ) – an instrument used by all universities as part of the Graduate Destination Survey. Additionally, most universities routinely survey students about their satisfaction with features of each unit (or subject) they complete. Unit level surveys are conducted 'in house', generally using instruments particular to each university or faculty. However, these instruments often draw on the scales of the CEQ to evaluate students' perceptions of teaching quality, the clarity of goals and standards, and the appropriateness of the workload and assessment tasks.

Evaluating student satisfaction of teaching remains controversial and problematic (see, for example, Richardson 2005; Wiers-Jensen, Stensaker and Grøgaard 2003; Baxter Magolda 1992). Further, there are many contextual factors that may influence students' perceptions of teaching quality (Wiers-Jenssen et al

2003). Davies et al (2007) found that ratings on good teaching were associated with numerous factors including cultural background and gender of the student, year level, unit type and unit size, course marks, and semester of offering. Thomas and Galambos (2004) found that the student's academic background was important in influencing perceptions of good teaching. As Davies et al (2007) notes, many of these influences are outside the control of the teacher. There is, however, some agreement relating to the reliability and validity of students' evaluations of teaching (see Marsh 1987 and Marsh and Dunkin 1992). Further, the research indicates that students and teachers have similar views about what constitutes good teaching (Goldstein and Benassi 2006).

The teaching activity that students experience and evaluate can be understood in terms of its process and structural dimensions (Goldstein and Benassi 2006). The structural dimension includes activities related to preparation for classes, and structuring and organising learning tasks and information. Excellent teachers focus on presenting materials in a clear and accessible manner. Process dimensions rely on the instructor's interpersonal skills and ability to encourage students to contribute, develop and think independently. Excellence on this process dimension involves an ability to establish rapport with students and engage them in their learning.

Most research into student satisfaction with teaching has shown that students' evaluations depend more on the process activities of teachers than structural dimensions. That is, students tend to evaluate perceived teaching quality in terms of the characteristics of teachers including their enthusiasm, presentation and clarity (Goldstein and Benassi 2006). They place less emphasis on teaching materials, media and facilities such as libraries and computers (Richardson 2005).

These findings raise issues for evaluating effective teaching in units of study delivered off-campus (or distance learning) modes. Firstly, in off-campus delivery, structure is provided through learning materials that may have been developed by a team of experts including content providers, instructional designers and media/technology consultants. Secondly, the process dimension of teaching activity is less visible and typically asynchronous. It too may be a divided role with different personnel responsible for different parts of the teaching process. Further, as the pedagogies that underpin off-campus delivery have traditionally expected and promoted greater student independence, there is also some division of responsibility between the teacher/tutor and student. In summary, the fragmented nature of offcampusoff-campus teaching activities and the shared responsibility for effective delivery make the evaluation of teaching quality by off-campus students, problematic (Richardson 2005).

However, the application of information and communication technologies (ICT) in education delivery has blurred the above distinctions between on- and off-campus delivery and has had considerable impact on the structural and process dimensions of good teaching. In on-campus delivery the use of ICT has generally served to extend, complement or replace some aspects of teaching. This is particularly true for the more structural dimensions of teaching; for example, learning materials may be richer, more interactive and flexible in format. But it also may affect the process dimensions of teaching: teachers may be more accessible through email and online communication. Similarly, the application of ICT for off-campus teaching has the potential to influence the teaching experience of students. In particular, communication tools enable teachers to more effectively 'reach' students and may support greater student-to-student engagement. That is, the process dimension of teaching can be enhanced considerably for off-campus students through the application of ICT.

However, greater use of ICT and greater online activity will not necessarily lead to improved ratings of good teaching. ICT may allow for the development of rich resources for students but these only address the structural element of 'good teaching' identified earlier. There are costs for students in accessing these 'rich' resources and these may be developed at the expense of interaction and dialogue (Thorpe and Godwin 2006) both of which are important in the process dimension of teaching.

Students may incur structural costs in the form of higher workloads (Lim, Morris and Kupritz 2007; Frederickson, Reed and Clifford 2005) and from cognitive overload (Dillenbourg and Traum 2006; Mayer and Moreno 2003). Further, capturing the hypothesised process benefits of online learning is also not easy. Frederickson, Reed and Clifford (2005) found that students experiencing web-based tutorial support rather than face-to-face were less satisfied because the tutors lacked visibility and had greater difficulties transmitting enthusiasm and motivation. Similarly, Summers, Waigandt and Whittaker (2005) found that students in the face-to-face class rated their instructor more positively on the quality of their explanations, enthusiasm, openness to students and interest in students than did those studying the same unit online. This difference in perception existed despite the fact that both groups were taken by the same instructor. Finally, Dillenbourg and Taum (2006) investigated the attitude of students completing

computer-mediated tasks and found that there were high interactions costs associated with communicating in these environments because of constraints in 'visibility and visual copresence'.

The above discussion leads to our first research question.

1. Is there a difference between the evaluations of good teaching of on-campus and off-campus students?

Because on-campus students will be better able to 'feel' the process dimensions of teaching, we might expect that on-campus students will, in general, be more satisfied with the teaching they receive than their offcampus counterparts. In addition, on-campus students may be less responsive to changes in the online learning environment. However, this may not be the case for off-campus students.

Students who enrol off-campus in a course of study are generally mature-aged students, often in full time employment and with family commitments (Wallace 1996). Many do not have the option of attending face-to-face classes and may indeed value the chance to work at their own pace and interact with the learning content on their own (Anderson, Annand and Wark 2005). However, while off-campus students may value their independence, they may also value the opportunity to communicate and interact with their instructors and peers (Thorpe and Godwin 2006; Summers, Waigandt and Whittaker 2005; Bernard et al 2004). ICT can be used effectively to improve the opportunities for connectedness of off-campus students. Further, the greater maturity and independence of off-campus students may reduce the cognitive and time costs they experience in interacting online. Therefore, off-campus students may perceive increased online activity as leading to improvements on the process dimension of the teaching they receive. Consequently, increased online activity may be associated with higher evaluations of teaching quality for off-campus enrolled students.

In summary, changes in aspects of online activity that relate to the process dimension of teaching may have different effects on students' evaluations of good teaching based on their mode of enrolment (on-campus or off-campus). This leads to our second research question:

2. Do different levels of online activity affect on-campus and off-campus students' evaluations of good teaching differently?

We include level of enrolment (undergraduate vs postgraduate) and discipline in our investigations, thus allowing for different answers to questions 1 and 2 for different cohorts of students.

Method and data

Since the start of 2003, students at the University have been invited at the end of each semester to complete a questionnaire - the Student Evaluation of Teaching and Units (SETU) questionnaire - to evaluate various aspects of each unit in which they are enrolled. The same questionnaire is used for students regardless of the unit of study, level of course or their enrolment mode. (The questionnaire items are in Table 1.)

A student's unit enrolment can be classified as either on-campus or off-campus. Students enrolled in on-campus mode typically receive three hours of face-to-face contact time (undergraduate units typically have a mixture of formal lectures and tutorials, postgraduate units have a greater proportion of seminars); access to a printed study guide and reader and an online unit site using WebCT/Blackboard Vista. Students enrolled in off-campus mode typically are provided with a printed study guide and reader and an online unit site using Blackboard. Regardless of enrolment mode, students in a given unit generally have access to the same learning materials, use the same online sites and complete the same assessment tasks.

The SETU evaluation questionnaire is available to students during the last three teaching weeks of each semester. From Semester 2 2006 the survey has been open for a 6 week period until the end of the examination period; prior to that the survey was available for approximately 4 weeks until just before examinations commenced. Most students complete the questionnaire online, but printed copies of the questionnaire are mailed to a small number of students, such as overseas students or those supported through some specialist centres of the University. The data is collected centrally by the University and is made available in aggregated form.

The questions on the questionnaire have varied over the period. However, Questions 1-7 and 9 shown in Table 1 below have been retained throughout the period with only minor rewording to a few items. Question 8 was added in Semester 2 2006.

Table 1: Student evaluation questionnaire items

1. The unit was well taught
2. The course materials in the unit were of high quality
3. The workload in this unit was manageable
4. Requirements for completing the assessment tasks in this unit were clear
5. The teaching staff gave me helpful feedback
6. The library resources met my needs
7. I would recommend this unit to other students
8. The technologies used to deliver the online content performed satisfactorily
9. The online teaching and resources in this unit enhanced my learning experience

Students respond to the questions on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). A 'not applicable' (NA) option is available for each question. In addition to their responses, information about the students' enrolment is recorded including: unit code; unit mode (on-campus or off-campus); campus of enrolment; and course level.

For this investigation we draw on the data for undergraduate and coursework postgraduate units offered by the business faculty of the university between 2004 and 2007. All the students were undertaking either a commerce-related course or a law course with a commerce focus. During this period 1288 unit offerings were evaluated (720 undergraduate, 568 postgraduate). Law units accounted for approximately 17 per cent of the units. The total number of student evaluations was 74109 (58535 undergraduate and 15574 postgraduate). The enrolment size of the units included in the investigation ranged from under 10 to well over 1000 students. The response rates per unit averaged 35 per cent over the period.

In addition to student evaluation data, we use data measuring the online activity of students in Semester 2 2007, from student tracking reports provided by Blackboard. For this investigation we use the following variables from these reports:

- Total number of Files Viewed for each student in each unit of enrolment. A 'File' is an object that is uploaded by a university staff member and is available for students to download ('View'). Examples include: Word documents containing assignment details, tutorial-type exercise or sample solutions, etc.; PowerPoint files for lecture notes; interactive learning objects such as Excel templates, etc. Files typically contain pre-prepared learning resources or support learning activities. They are largely related to the structural dimension of teaching, though files can contain interactive learning activities that may also relate to the process dimension of teaching.

- Total number of Read Discussion Messages for each student in each unit of enrolment. Discussion messages may be posted to Blackboard by students or staff during the semester. They relate mostly to the process dimension of teaching. The number of read messages is therefore a measure of the level of process activity in the unit.

- Total number of Posted Messages for each student in each unit of enrolment. The number of posted messages is another measure of the level of process activity.

The Student Tracking reports contain data down to the individual student-enrolment level. However, for our investigation we work with data aggregated at the same levels at which the SETU data was aggregated, namely at the unit and/or mode (On/Off) levels. These tracking reports were downloaded at the end of Week 8 in the semester; approximately two-thirds of the way through the semester. Data at this time gives a good indication of overall online activity in a unit.

For the analysis, we used class enrolment data to rescale the (aggregated) data from the student tracking reports to provide measures of online activity per student.

Findings and discussion

Assessment of the impact of changes in the online environment on student satisfaction with teaching was carried out in three main steps.

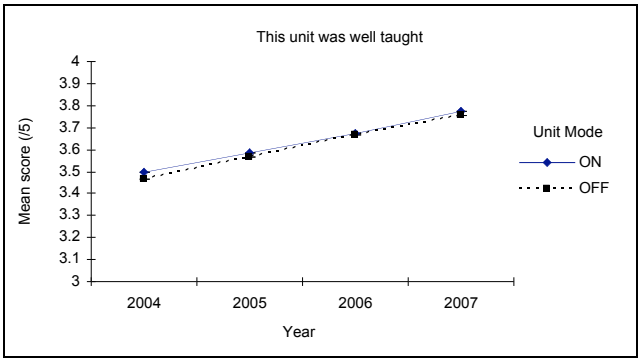
1. Is there a difference between the satisfaction of on-campus and that of off-campus students and are differences by mode of enrolment independent of course level?

As noted above, the learning environment is quite different for on-campus students and off-campus students and we might expect there to be a difference in the evaluations provided by these different cohorts of students (research question 1). Figure 1 shows how evaluation scores on Question 1, "This unit was well taught" have changed over time, with separate analyses for undergraduate and postgraduate students.

Undergraduate students

Year	Mode	Mean score	N
2004	ON	3.50	12179
	OFF	3.46	2683
2005	ON	3.59	10760
	OFF	3.57	1641
2006	ON	3.67	12809
	OFF	3.67	2186
2007	ON	3.78	13965
	OFF	3.75	2312

No differences between ON and OFF are statistically significant at the 0.05 level.



Postgraduate students

Year	Mode	Mean score	N
2004	ON	3.65	2427
	OFF	3.24	1305
2005	ON	3.72	1906
	OFF	3.39	831
2006	ON	3.92	2425
	OFF	3.66	1243
2007	ON	3.98	3699
	OFF	3.76	1738

All differences between ON and OFF are statistically significant at the 0.001 level.

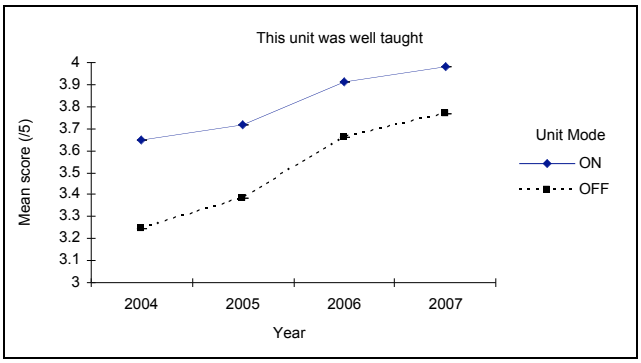


Figure 1: Changes in results for 'This unit was well taught'

The first thing to note is that the scores provided by all cohorts (undergraduate/postgraduate, on-campus/off-campus) have increased significantly over the period 2004-2007. However, there is a significant difference between on-campus students and off-campus students only at the postgraduate level; there is very little difference between the mean scores provided by on-campus and off-campus undergraduate students, postgraduate on-campus students rate the teaching in units approximately 0.2 higher on average than off-campus students.

We investigate factors that might account for the observed features in Figure 1 in the following section.

2. Do different levels of online activity affect on-campus and off-campus students' evaluations of good teaching differently?

We investigate to determine if differences in the online environment could account for the results found in the previous section.

Before reporting findings in relation to the degree of online activity in units, it is interesting to observe how students themselves perceive their online learning experiences. Table 2 shows the mean scores for on- and off-campus students over the period 2004-2007 on Question 9, 'The online teaching and resources in this unit enhanced my learning experience'.

Table 2: Mean scores on Question 9, 'The online teaching and resources in this unit enhanced my learning experience'

	Mode		
	ON	OFF	
All	3.62	3.55	$p < 0.001$
UG	3.59	3.61	Not significant at 0.05 level
PG	3.75	3.45	$p < 0.001$

The results in Table 2 show that there was no significant difference between the evaluations of on and off-campus undergraduate students on Question 9. However, there was a significant difference for the post-graduates with the on-campus enrolled students agreeing much more strongly that: "the online teaching and resources in this unit enhanced my learning experience". These results suggest that level of online activity may be a significant factor affecting students' evaluation of teaching for postgraduate students but not for undergraduate students. We explore this possibility further below.

Tables 3 and 4 shows the results from analyses exploring relationships between student evaluation of teaching (Q1) and various measures of online activity of students from the student tracking reports provided by Blackboard. The analysis technique is multiple linear regression, including Question 3 (The workload in this unit was manageable) as a covariate. (Note that factors in addition to Q3 were initially included in the regression, but were found to not be significant predictors of student satisfaction with teaching. It is interesting that other researchers (eg Marsh and Roche 1997, Remedios and Lieberman 2008) have suggested that workload is not a factor directly affecting student satisfaction if other factors such as learning outcome are included. We have included workload in our model because it is a significant source of variation for student satisfaction and we do not have access to other learning outcomes for this study. It is also interesting that simple regressions of 'perceived workload' (Question 3) against the mean score (for a class) for 'Read messages/Student' show that these variables are negatively related. That is, as the amount of online activity increases, so to does the perceived workload. Of course this is not surprising, but it does suggest that online resources and activities may be being incorporated into learning environments, as additional to, not as a replacement for, other (more traditional) resources and activities. Table 3 shows the results from the multiple regressions for undergraduate/postgraduate; Table 4 shows results for undergraduate law/nonlaw units.

Table 3: Results from multiple regression models for student satisfaction (SETU question 1: 'This unit was well taught')

Online activity	Mode	Undergraduate/Postgraduate	
		UG	PG
Files viewed/ Student	ON	Positive ***	Negative ***
	OFF	Positive ***	Positive ***
Read messages/ Student	ON	Negative **	Positive **
	OFF	NS	NS
Posted messages/ Student	ON	NS	NS
	OFF	Negative *	Positive ***

NS = Not statistically significant, * = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$

Table 4: Results from multiple regression models for student satisfaction (SETU question 1: 'This unit was well taught'). Undergraduate students only

Online activity	Mode	Undergraduate Course	
		Law	Commerce
Files viewed/ Student	ON	Negative ***	Positive ***
	OFF	Negative *	Positive ***
Read messages/ Student	ON	NS	Negative **
	OFF	Negative ***	Positive *
Posted messages/ Student	ON	Negative **	NS
	OFF	Negative ***	NS

NS = Not statistically significant, * = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$

There are a number of interesting results shown in Tables 3 and 4:

- Table 3 shows that, on the whole, postgraduate off-campus students become more satisfied as the level of online activity increases. There is a positive relationship between student satisfaction scores and two of the three measures of online activity investigated.

- The findings for postgraduate on-campus students are mixed. Table 3 shows there is a positive relationship for 'Read messages', but a negative relationship for 'Files viewed per student'. This could indicate the postgraduate students value more interactive communications or messages from peers.

- The picture arising from Table 3 seems not as clear for undergraduate students as it does for postgraduate students. Undergraduate students seem to become more satisfied as they view more learning resources online, but the relationship is negative for other measures of online activity. Including 'Discipline' (Commerce versus Law) for undergraduate students as in Table 4 helps to make matters clearer. That table shows that, on the whole, undergraduate Law students who experience greater online activity are less satisfied with teaching; undergraduate Commerce students, on the other hand, are more satisfied. This warrants further investigation; there may be other factors at play, such as possibly a difference between domestic and international students.

These types of results could help explain some features of the satisfaction data for on-campus and off-campus students as reported in Figure 1. For example, it could be that the reason for an increase in the satisfaction-with-teaching scores over the period 2004 to 2007 for some cohorts of off-campus students is improvement in the level of online activity in the units they study. . This is the subject of ongoing research.

Conclusion

In this paper we examined the relationship between students' evaluations of teaching quality and their level of online activity in their units of study. Conceivably, the use of online technologies can contribute positively to both the structural and process dimensions of the teaching activity. As a consequence, students who engage in higher levels of online activity may also record higher levels of satisfaction with the quality of their teaching. We found some limited support for this proposition.

Between 2004 and 2007 student satisfaction with the quality of teaching trended upwards for cohorts of students regardless of their mode or level of course. All students in the study were exposed to some degree of online activity in the units they studied. However, our investigations did provide some evidence that some cohorts of off-campus students may evaluate teaching quality more positively as the level of online activity increased. This result was more likely for postgraduate rather than undergraduate students and commerce rather than law undergraduates. Regardless of course level, off-campus students are more reliant on the online learning environment for their learning experience. The results from our investigation suggest that these students will benefit most from improvements in online activity.

The fact that increasing online activity was not related to increased student satisfaction with teaching for on-campus students is concerning given the high expenditure in time and money that is devoted to online delivery in our universities. Arguably, traditional on-campus undergraduates will continue to see face-to-face study as superior to online study in terms of the former's ability to enthuse, motivate and engage them in their learning. Further, as students appear to judge teaching quality more on its process than its structural dimension, intensifying the use of online resources and delivery is unlikely to bring about improvements in these students' evaluations of teaching quality.

Future investigations into this relationship between students' evaluations of teaching quality and online activity requires more nuanced measures of online activity and a consideration of other variables that may influence students' ratings of teaching quality including characteristics of students such as their gender, cultural background, academic performance and motivation; and characteristics of units including their discipline, content, size and dominant pedagogies.

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