

# When Innovation Fails: Methods for Collection of Student Feedback

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## ABSTRACT

Student Evaluation of Teaching (SET) feedback has demonstrated utility for students, faculty and management. With recent advances in computer technologies, SET surveys are increasingly being delivered online. Online delivery reduces cost and administrative load, and increases the flexibility of access. Unfortunately, online delivery is frequently associated with a sharp drop in response rates relative to traditional in-class, paper-based delivery. Our experiences with online SET delivery have followed this pattern, although the reasons usually proposed for the effect might not be expected to apply to Information Technology students. In this paper, we describe a study directly comparing response rates using the two delivery modalities, which showed a dramatic advantage for paper-based delivery. We discuss the likely causes for this result and methods for improving online response rates in IT departments.

**Keywords:** Student evaluation of teaching; online survey tools

## 1. INTRODUCTION

Information Technology educators who wish to improve their teaching practice will realise that, as with any systems analysis problem, it is essential to have a good measure of performance. The ideal measure of teaching performance is, of course, student learning, but this is notoriously difficult to quantify. The obvious choice of course grades is subject to bias and random error, and cannot capture important learning outcomes such as work-readiness, or preparation for lifelong learning. Other metrics such as peer feedback and student performance on standardised assessments can augment the data, but increasingly over the past two decades, the most used measure of teacher effectiveness has been direct feedback from students.

The use of organised, institutional Student Evaluation of Teaching (SET) systems was originally controversial (Greenwald, 2002; Marsh & Roche, 2000). There were two major concerns: First, many educators questioned the content validity of SET - that is, whether student feedback was an accurate measure of teaching quality (Felder & Brent, 2008). Some educators feared that SET was simply a "popularity contest", where teachers who were charismatic and approachable received higher ratings than those who were less so, regardless of teaching efficacy. Others were concerned that SET would be influenced by course grades and workload, where teachers who gave high marks or who taught easy material would receive higher ratings, again regardless of the quality of teaching. As described by Moore & Kuol (2005), in the early days of SET, educators feared that students were not evaluating teaching performance, but merely expressing "their own sense of comfort and satisfaction".

Obviously, if SET data do not actually measure teaching effectiveness, they cannot be a valuable tool for evaluating and improving teaching practice. Some researchers feared that the confounds described above might even lead to a worsening of teaching practice if, for example, teachers were tempted to reduce essential workload in order to improve their student feedback. However, the results of many hundreds of studies of SET (see Marsh, 2007 and Richardson, 2005, for

reviews) have demonstrated that student feedback can, in fact, provide accurate insight into teaching quality. These studies have found strong correlations between SET data and other metrics such as peer ratings, alumni ratings and specific, validated measures of learning. Further, they have found that SET data show good reliability between raters and over time. The nearly universal conclusion is that a well-designed SET tool does provide a valid measure of teaching efficacy.

The second major concern about SET data is that it may be used punitively. If SET data is made publically available to students, it may have a negative impact on course enrolment. If it is made available to management, it may have a negative impact on promotion or even job retention. SET instruments are often complex, consisting of numerous items and testing many different facets of teaching quality, such as the instructor's area knowledge, delivery style, rapport with students and organisational skills, as well as course difficulty. Like all human data collection tools, SET surveys are subject to variability and measurement error. Accurate interpretation of SET data must take these statistical nuances into account. Especially where used to inform employment decisions, there is a risk of oversimplification. Most area experts accept that this is an unavoidable shortcoming of SET data. However, this does not mean that the tool should be abandoned. It means that SET data should be used as one element in a broad collection of quality and performance measures (Moore & Kuol, 2005).

## 2. S.E.T. AND TECHNOLOGY

The majority of large-scale SET data collection is done using simple questionnaires which contain a variety of statements describing the performance of an instructor or the nature of a course. Typical examples are "The instructor is well-organised" or "The course assessments are appropriate to the content". Responses are given via Likert scale, where the student expresses his or her agreement with the statement on a five or seven point scale from "Strongly agree" to "Strongly disagree". The use of Likert items provides a standardised response format, allows for familiar descriptive statistical summaries such as frequency distributions, means and standard deviations, and minimises the data entry and analysis burden. Unfortunately, such a structure imposes great rigidity on the student's ability to give feedback, so well-designed SET tools also provide opportunities for open-ended comments. The result of the evaluation is the combination of a

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quantitative analysis of the Likert items and a more qualitative consideration of the free-form comments.

Originally, SET evaluation was done on paper. Responses were then manually transcribed into an analysis tool for summary. The use of Scantron<sup>1</sup> or equivalent machine-readable data entry forms was often used to partially automate data entry. However, with developments in digital technology over the last decade - especially web access - SET has increasingly been moving online. In these implementations, the SET tool is made available on the on the web, students can complete the tool at their leisure, and no manual transcription of data from paper forms is required. The advantages of online SET - in reduced costs and improved convenience - seem self-evident. So it is surprising that web-based systems have, in general, not been entirely successful. Specifically, when compared with traditional in-class paper-based systems, online SET tools produce much lower response rates (Nulty, 2008; Anderson, Cain & Bird, 2005; Bennett and Nair, 2010; Adams, 2012). The results of Dommeyer et al. (2004) are typical: They studied 16 different courses at a large North American state college. In each course, there were two identical streams. For the end-of-semester SET, one stream of each course was surveyed using an in-class, paper-based instrument while the other was given access to an online version. The online tool was freely accessible for an extended period of time, provided a secure log-in, and could be accessed from personal or on-campus computers. Across the 16 surveyed courses, the average response rate for the online streams was 30% lower than the average for paper-based delivery. For the 10 courses that showed a statistically significant difference between the two delivery modes, *all* had a lower response rate for the online stream, and some of these differences were substantial (e.g. in one case the paper-based response rate was 84% and the online response rate was 20%).

If SET data are to provide meaningful insight into teaching performance, adequate response rates are essential (Dommeyer et al., 2005). Data from a small sample of students can easily be non-representative of the student population as a whole. Simple sampling error (in which a small random sample fails to provide broad coverage of the population) can produce misleading results. Of more concern, a small sample may be biased. That is, the respondents in the sample may differ from the population in some systematic way. In the specific case of online vs. paper-based SET delivery, it might be the case that, for example, only students who are particularly unhappy with the class are motivated to take the online SET survey (Crews and Curtis, 2010). This would lead to SET results that were inaccurately negative. Thus the low response rates of online delivery effectively negate their administrative advantages. Following standards for other human factors data collection, an SET response rate of 70% is desirable; a response rate of 50% is considered an absolute minimum (Richardson, 2005).

Efforts have been made to identify the cause of low response rates for online SET tools (e.g. Adams and Umbach, 2010; Berk, 2012). Some studies have highlighted concerns about anonymity. Online SET systems invariably require a login, to insure that the survey is only completed by real students, and that each student provides responses only once. Students have expressed concerns that their login information will somehow be connected to their responses, and conveyed to the instructor. Other studies have suggested that the more independent nature of online surveys may be a problem. Students doing SET in-class are effectively a captive audience - they will be surveyed simply because they show up to class

that day. Online systems, in contrast, require students to independently log on and fill out the survey in their own time. Possibly the most commonly proposed argument for why online response rates are low is that students find the computerised survey tools confusing and difficult to use (Crews and Curtis, 2011). As IT educators, we might be forgiven for assuming that the "too hard" explanation would not apply to our students. Almost by definition, IT students are computer literate, and it is difficult to see how a student who is learning to build web sites or manage web servers would be challenged by accessing and responding to a simple online survey. We would thus assume that the ubiquitous reduction in response rates for online systems would not apply to IT departments. Unfortunately, our own experience shows quite clearly that this is not the case.

### 3. S.E.T. COLLECTION AT OTAGO POLYTECHNIC

Otago Polytechnic implements a wide-reaching system of SET. For each paper, two independent evaluations can be performed - one containing questions focussing on the course content and one containing questions focussing on the performance of the instructor. Both instruments follow the typical "Likert items + open-ended comments" format. Evaluations are managed by a centralised institution service unit. Surveys are arranged at the request of the instructor, but there are institution-wide policies about the expected frequency of evaluation, and evaluations are required for certain promotion and salary reviews.

Until approximately 2005, all surveys were paper-based. At that time, Otago Polytechnic began to experiment with online delivery. A variety of approaches have since been trialled. The earliest system involved production of a set of random single-use logons. Instructors would print these on small pieces of paper and distribute them to students. Surveying could be done in-class if the class session was held in a computer suite, or students could access the online survey tool outside of class from a campus machine. Later, as the online survey technology matured, the system became completely web-based, and students now access it via their standard Otago Polytechnic computer account. To arrange an evaluation, instructors send an email to the central surveying administrator, specifying the paper, type of survey (course or instructor evaluation) and timeframe requested. The survey is built and put online. All students enrolled in the paper are informed of the survey's availability via email and text message; regular reminders are sent during the period of availability. After the semester is finished, survey summaries are sent to school and programme managers, who pass them along to the faculty.

Since the introduction of the online delivery system, there has been a consistent decline in response rates for papers in our school. By 2013, the majority of IT classes were failing to meet the minimum response rate required for accurate SET data. Among the eight second year papers offered in the first semester of that 2013, *no paper* achieved the necessary 50% response rate. Clearly, this indicated a problem with the collection of SET data. While still convinced that our students could not be finding the automated survey tool too technically challenging, we could not ignore the fact that the decline in response rates seemed to coincide with the move toward online SET collection. We thus decided to explore directly the difference between online and paper-based delivery for our IT students.

### 4. METHOD

In the first semester of 2014, we augmented the existing institutional SET system with an in-class paper-based survey.

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<sup>1</sup> www.scantron.com

All eight second year papers offered in Semester 1 were included in the study. Each instructor was approached by the authors and asked for permission to perform this additional SET survey during class time. All instructors agreed to participate. The survey time was scheduled at the instructor's convenience (some preferred the end of class time, some preferred the beginning). A total of 132 individual survey forms were collected across the eight papers.

#### 4.1 The Instrument

As the students in the participating papers might still be asked to complete an institutional SET survey, it was necessary for our study to use a different instrument. The importance of using a well-designed and well-validated survey tool has been amply demonstrated (Felder and Brent, 2008). To insure that our tool met these standards, we used the SET survey developed by the Stanford University Center for Teaching and Learning. This survey contains 23 Likert-scale items covering six areas: student demographics, overall course ratings, overall organisation and clarity, instructor's ability to engage students intellectually, instructor's interaction with students, course content and evaluation (i.e. assessment) and section/lab integration (Stanford, 2014). It also provides for open-ended comments about specific strengths and weaknesses of the instructor and the course.

#### 4.2 Survey Administration

Protection of student anonymity is one of the critical issues surrounding SET collection regardless of the delivery mechanism. Although SET tools generally do not require a name, ID number or other identifying information, students may still be concerned that an instructor might see a student's form when it is handed in, or perhaps recognise an individual student's handwriting. It is sometimes argued that one of the strengths of online delivery is that these risks are eliminated. However, as discussed above, students themselves do not see online delivery as a panacea in this regard. To insure respondent anonymity in our study, delivery of the survey was done by a non-teaching member of staff (a departmental administrator) in all but one of the data collection sessions. (In the remaining session, scheduling constraints required that the tool be delivered by a member of teaching staff, but one who did not teach any of the papers included in the study). The non-teaching staff member arrived in the classroom at the scheduled time, and the course instructor left the room. The survey materials were distributed and students were given sufficient time to complete the surveys. The staff member then collected the survey papers and delivered them to the non-teaching author for data entry and analysis. The course instructor never saw the survey instruments, or any summary of results, until all final semester grades for the paper had been submitted.

#### 4.3 Informed Consent

It is generally accepted that SET should be voluntary (cf. Richardson, 2005). That is, a student does not, by enrolling in a paper, assume any obligation to provide evaluation feedback. In the present study, it was also necessary to insure that students realised their feedback was being used in a research context, and that summaries and discussions of their data could potentially be used in publication. Thus, the survey tool included a cover page which outlined the purpose of the study, and explained that no results would be conveyed to the course instructor until all grades for the semester had been finalised. The cover text also emphasised the voluntary nature of the survey. Students were informed that if they did not wish to fill out the survey, they could simply leave it blank, and that information about who did or did not complete the survey would never be conveyed to the course instructor. Three of

the 132 survey forms (2%) were returned blank, indicating that those students had chosen not to participate.

#### 4.4 Data Entry

As stated above, completed survey forms were returned to the non-teaching author. All Likert scale responses were entered manually into an Excel spreadsheet for summary and analysis. The need for manual data entry is considered one of the most serious drawbacks of paper-based SET delivery. It should be noted, however, that the entry of results for all 129 completed surveys took under two hours (less time than a typical staff meeting, for example). The use of a Scantron form would reduce the data entry workload even further.

For this study, no attempt was made to code or quantify student comments. Instead, instructors were simply given the opportunity to read the original survey forms after all final course grades had been submitted. A more thorough analysis would require some recording of the comments, and this could potentially increase the data entry burden considerably (cf. Beran et al., 2005).

### 5. RESULTS

A comparison of the proportional response rates from 2013 and 2014 is shown in Figure 1. A student is considered to have responded if he or she completed the online survey for the course (for 2013) or handed in a completed paper survey form (for 2014). As the survey instruments used in the two years were different, we are not attempting to compare specifically the amount or quality of information obtained, but merely the proportion of students from whom we obtained feedback.

Response rate increased for all eight papers included in the study. The amount of increase ranged from 8% to 61%, with a mean across all papers of 35%. A paired-sample t-test comparing the 2013 and 2014 response rates was highly significant ( $t=5.605$ ;  $p<.001$ ). In the 2014 paper-based survey, five of the eight papers achieved a response rate above the ideal 70% threshold; two more exceeded the acceptable minimum of 50%. This is in contrast with the performance of these same papers in the online survey of 2013, where none achieved 50%. Clearly, even for IT students, the mode of SET delivery has a huge impact on response rates and, therefore, on the quality of the obtained SET data.

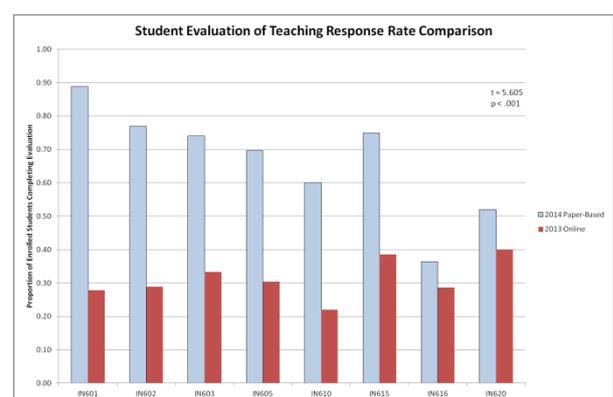


Figure 1: Comparison of Paper-Based and Online Response Rates

### 6. DISCUSSION

The results of this study demonstrate clearly that, even for computer-literate IT students, higher SET response rates are obtained with in-class, paper-based delivery than with online, out-of-class delivery. A simplistic response would be to

simply decide to use paper-based surveys. However, this would be to ignore the undeniable advantages of online delivery: reduced administrative burden and greater flexibility for the students. It may also be unrealistic for institutions with large class sizes. Thus, it is important to try to identify the causes of poor response rates for our student population.

We continue to reject the notion that our students fail to participate in the online survey because they find the tool too challenging to use. Completing the online survey requires only logging on to the institutional network, following a provided link, and filling out a simple web form. Our students perform more complex computer interactions than these every day. Nor do we believe that our students are concerned about violation of anonymity when using the online tool. Their understanding of web development and network protocols is sufficiently sophisticated that they realise the risk of their log in information accidentally or "magically" being provided to their instructors is extremely small.

Instead, we believe that the salient distinction between the two delivery methods is simply the amount of independent effort involved. Taking an in-class, paper-based survey is easy: the student is already in the classroom, the survey is scheduled for him or her like any other classroom activity, the tool is provided and collected. In contrast, an online out-of-class survey requires effort: the student must make time in an already busy schedule and organise himself or herself to access the tool and complete the form. We suspect that many students are not sufficiently motivated to expend this extra effort in order to provide course feedback. In essence, response rates to online surveys are low because our students "can't be bothered". To increase their participation, we must increase their motivation.

Berk (2012) suggests that students can be motivated to participate in online SET by providing a sort of sweepstakes, where completing the survey gives one a chance to win a prize. We doubt the value of this approach. First, not all students will be interested in specific prizes. Second, the astute student will realise that the odds of winning in such a situation are likely to be small. A more effective and sustainable strategy is to begin by considering why a student might feel apathetic about providing course and instructor feedback. The most probable cause is the belief that doing so is unlikely to have real impact or to result in real change. This is, sadly, not an unreasonable assumption for students to make. Beran et al. (2005) performed a large study of how SET data are used by students, faculty and management. They found that, while the majority of teaching faculty claimed to support the collection of SET data in principle, very few reported actually using it to improve their own teaching practice. If students have no reason to believe their input leads to change, they are unlikely to make any particular effort to provide that input.

To address this problem, it may be useful for instructors to spend more time explaining the purpose and value of SET to students and encouraging them to take the online surveys (although our anecdotal experience is that this has very minimal impact). We believe a much more effective approach is to "put your money where your mouth is". That is, instructors need to conscientiously take action in response to SET, and they need to *demonstrate this action* directly to their students. For example, recent SET feedback for a paper taught by one of the authors showed that students felt the final large programming assignment was scheduled badly, as it coincided with the defense of their senior student projects. In response, that paper will now be modified to require two smaller assignments, the first of which will be due in the middle of the semester. This will reduce students' total work load in the

final week. This change, and the fact that it was made in response to student feedback, is detailed in the Course Descriptor provided to students at the start of the paper. The authors' school is in fact considering making "Actions in Response to Student Feedback" a required section of the introductory handouts for all papers. It is our belief that the best way to motivate students to provide input is to demonstrate that they can have a concrete impact, that they can drive change and improvement. (It must be noted that this approach - listening to students and acting on their feedback - has the associated potential benefit of producing a real improvement in one's teaching practice.)

Bennett and Nair (2010) also contend that students are unlikely to make the effort to voluntarily provide feedback if they have no reason to believe their opinions are heard and acted upon. At their institution, therefore, they implement a "comprehensive and targeted communication strategy aimed at achieving 'buy in' from staff and students." They devote time before the survey becomes available to discussing with students the importance of SET. They insure that senior academic and managerial staff express publically their commitment to the SET process. Faculty are expected to discuss with students feedback from previous courses and give details of the actions taken. As a result of this approach, Bennett and her colleagues have achieved online response rates of more than 83%, nearly twice as high as other departments in the same institution using the same online tool.

A secondary potential problem with the current online delivery system at Otago Polytechnic is the notification and reminder policy. The survey administration unit sends multiple email and text reminders to students while an online survey is available. A student taking the normal load of four papers may receive dozens of such notifications during the late weeks of the semester. Anecdotally, our students report finding this extremely annoying. In fact, some describe it as spam. Adams and Umbach (2010) note the risk of "survey fatigue". They found a quadratic trend in response rate as a function of the number of surveys students were asked to fill out during a single semester. That is, response rates were acceptable when students were asked to complete only a small number of surveys. But as the number of surveys rose, response rates reached asymptote and eventually began to decline. Digital surveys and reminders are easy to prepare, and can be created and assigned at minimal cost. This ease may lead survey administrators to become overenthusiastic and end up simply asking for too much. When attempting to leverage online technologies we must be careful to also observe the rules of online etiquette.

By providing real evidence that student input is valued (and by requesting that input in a well-mannered way) we can hope to garner the benefits of online SET systems while achieving sufficiently broad participation to guarantee useful data. However, it must be noted that anything lower than a 100% response rate means that some student's voice is not being heard. Perhaps a range of feedback mechanisms must be provided to serve the needs of all students. In our enthusiasm for Scantrons, web-based survey tools and questionnaires delivered by mobile app, we should remember that the best tool for encouraging student feedback may be the open office door.

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