

Harnessing Information Technology to Improve the Process of Students' Evaluations of Teaching: An Exploration of Students' Critical Success Factors of Online Evaluations

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ABSTRACT

This paper discusses the relative advantage offered by online Students' Evaluations of Teaching (SET) and describes a study conducted at a Canadian university to identify critical success factors of online evaluations from students' point of view. Factors identified as important by the students include anonymity, ease of use (of both SET survey and system), accessibility, publication of results, subsequent adjustments to the course, SET survey redesign, system reliability, incentives, reminders, and conveying the importance of the SET survey to students. We discuss key implications of the factors identified to faculty and survey administrators.

Keywords: Online Teaching Evaluations, Students Evaluation of Teaching, Feedback, Delphi technique, Systems Theory, Diffusion of Innovations

1. INTRODUCTION

This paper explores the benefits of online students' evaluations of teaching (SET) over traditional paper-based surveys and empirically elicits students' perceived critical success factors of online SET. Students' evaluations of teaching are an important feedback mechanism for instructors and students. By completing survey-like evaluations students can provide valuable insights to instructors pertaining to the effectiveness of their teaching. SET are generally seen to serve three purposes: (a) formative – as a feedback mechanism to faculty for instructional improvement; (b) summative – as an evaluation mechanism for purposes such as tenure and promotion of faculty; and (c) informative – to assist students in selecting future courses (Schmelkin et al. 1997). Of these, the formative – or feedback – role is perceived as very important by both students and faculty (Chen and Hoshower 2003, Nasser and Fresko 2002).

The concept of feedback is an important part of all adaptive systems (Wiener 1950) – including human ones – which require ongoing feedback to adjust their behaviour in a manner conducive for attaining their desired goals (Debusse et al. 2007, Dechert 1965, Frederick 1998, Strong 1982). If we consider that one important goal of faculty is to impart knowledge to students then the role of an effective feedback mechanism in the form of SET becomes quite clear.

Traditionally, SET are paper-based surveys administered once at the end of a semester. Such a feedback mechanism, however, has several limitations material to its effectiveness. Research has shown that the immediacy of feedback is positively associated with its usefulness (Burke and Chidambaram 1999), that the relevance of the feedback will determine the extent of actions taken as a response (Strong 1982), and that the effect of feedback is often short-lived and becomes attenuated over time (Brown 1972). Thus, a mechanism which provides a standard evaluation form and is

administered once at the end of the semester is likely to be only marginally useful.

While it is possible to change the process of administering paper-based SET surveys to provide more effective feedback, for example by repeatedly administering the survey throughout the semester, the cost of such a process is likely to be quite high and its administration complicated. Consequently, many universities have begun to explore the use of online teaching evaluations, either through dedicated tools or as part of a more general course management system. Borrowing the notion of relative advantage from diffusion of innovation theory (Moore and Benbasat 1991, Rogers 2003) we begin this paper by examining in depth the relative advantages of online SET compared with paper-based SET, as they are used today, *in the context of the feedback they offer*. Relative advantage is an important concept in innovation diffusion and it refers to the extent to which an innovation is perceived to be better than its precursor (Rogers 2003).

2. THE RELATIVE ADVANTAGE OF ONLINE SET

By and large, prior research has reached the following conclusions with respect to online teaching evaluation surveys: online surveys are more resource-efficient and offer greater convenience, ease of use, and student satisfaction; they elicit more comments and qualitative responses compared with paper-based surveys; they are weaker in providing feelings of anonymity to respondents; and finally response rates are lower compared with paper-based surveys although there is no apparent non-response bias (e.g., Avery et al. 2006, Dommeyer et al. 2002a, 2004, Kasiar et al. 2002, Layne et al. 1999, Leung and Kember 2005, Oliver and Sautter 2005, Sax et al. 2003). It is interesting to note here, however, that while these studies were conducted at a single post-adoption point in time, Avery et al. (2006) suggest that once adopted, online SET will yield increasing response rates over time. Such view is consistent with the diffusion of innovation literature (e.g., Rogers 2003).

To leverage their potential advantages, and lessen their response rate limitations, an investigation of the critical success factors for the adoption of SET by students is merited, and conducted in this paper. Before doing so, however, we discuss another important relative advantage offered by online SET, beyond those benefits already discussed in the literature.

We suggest that a key relative advantage arises from the importance of an effective feedback mechanism, which allows both faculty and students to adapt their behaviour and, more specifically, enables faculty to use the feedback to obtain their teaching and professional goals. This is not to say that paper-based SET are incapable of providing actionable feedback if designed to do so, but rather that online SET offer some key advantages which stem from their inherent flexibility, cost effectiveness, and ease of use characteristics. This relative advantage of online SET is important and is expected to be a main contributor to adoption, as we will demonstrate in our empirical investigation later in the paper. First we discuss why we see online SET as better than paper-based surveys at providing such feedback.

2.1 Immediacy of Feedback

Research has shown that the immediacy of feedback is positively associated with its usefulness (Burke and Chidambaram 1999). Moreover, the shorter the time elapsed between actions of students and responses of instructors, the better the student learning and course satisfaction (Arbaugh 2001). Thus, it would appear that an instructor who receives immediate feedback on her teaching – and acts upon this feedback – is more likely to be perceived as an effective teacher. This suggests that the traditional practice of end-of-the-semester evaluation may not be the most effective feedback mechanism, since it provides the instructor with information about interactions that no longer exist.

Online SET improve upon traditional paper-based SET in that it takes less time to process the survey, and feedback can be provided to faculty in a timely manner. Further improvements can be made if the surveys are not solely administered at the end of a course, but rather are conducted at earlier time points throughout the semester (while this is also possible with paper-based SET, it is much easier and less costly to achieve with online SET given their flexibility and efficiency).

A combination of surveys administered earlier in the term and immediate analysis of survey responses will ultimately yield a more effective feedback to faculty. Thus, in terms of immediacy of feedback, online SET offer a clear relative advantage over traditional paper-based SET.

2.2 Flexibility of SET Survey Design

Adaptive systems, (e.g., university instructors), tend to only process information which they perceive as significant to the achievement of their goals (Strong 1982). Thus, it is possible that the standardized nature of paper-based evaluations may contain information deemed as irrelevant by certain instructors and may consequently be ignored by them. For example, an instructor may disregard an evaluation when it becomes apparent that many students complain about the facilities, an issue over which the instructor has no control and therefore does not connect with impacting goal attainment.

Compared with paper-based surveys, online SET offer a more flexible design at a lower cost. To some extent, past research has implied the benefits of such flexibility, offering many indications that online SET encourage more qualitative input from students (e.g., Layne et al. 1999, Oliver and Sautter 2005). More specific studies on the design of SET show that when given the opportunity, students become highly engaged in designing and selecting specific items to be incorporated in the survey (e.g., Divoky 1995). The benefits of such approach include ensuring that relevant or unique questions to the specific domain are incorporated into the survey and that questions are weighted appropriately (and not necessarily equally). Using online SET, instructors can incorporate domain-specific questions, level-specific questions (e.g., an introductory course vs. an elective course), method-specific questions (e.g., teaching cases), and other items they believe are relevant to them and their students.

Thus, with respect to both flexibility and relevance of feedback provided, online SET offer another relative advantage over paper-based SET.

2.3 Frequency of Feedback

The effect of feedback is often short-lived and becomes attenuated over time (Brown 1972). Therefore, it appears that integrating the feedback mechanism into the process (e.g., teaching) and providing it on an ongoing basis, rather than as a singular event, would be more conducive to directing the system (in this case, the instructor) responsible for the execution of the process (Nadler 1976).

Again, online SET offer a relative advantage over paper-based SET as these surveys can be conducted on a continuing basis throughout the semester, offering ongoing feedback to teaching faculty. By responding to such feedback, faculty can provide feedback to students who in turn can provide additional feedback to the instructor in continuous cycles. Thus, rather than a single point of feedback at the end of the semester, online SET offer an open feedback loop mechanism, with lower demand on resources.

We have thus far discussed how online SET have the potential to provide relative advantage vis-à-vis paper-based SET, beyond the previously identified benefits of resource efficiency, convenience, and ease of use. However, such relative advantage cannot be realized without the proper adoption of online SET. Adoption of online SET can be studied at multiple levels, such as the university, the department, the course, and the individuals involved in the course. Online SET adoption can also be studied from the points of view of different stakeholders, such as faculty, administrators, and students. While all these points of view are relevant and important to the success of online SET, this paper focuses on students' perspectives, and what they perceive to be the critical success factors for online SET.

The key reason for studying students' points of view in this paper is rooted in an important limitation of online SET extensively discussed in prior literature – namely, their low response rates. For example, Dommeyer et al. (2002b) noted that faculty prefer paper-based SET because they believe it will result in greater accuracy and higher response rates. We argue that understanding students' critical success factors for adopting online SET is therefore a priority, as it can then serve as the foundation for a complementary study of faculty and administrative concerns. Moreover, extant literature shows that students' satisfaction, as a factor in student evaluations of teaching, has been largely ignored, and little research has been done on how students perceive and use teaching evaluations (Dommeyer et al. 2002a, Schmelkin et al. 1997, Wilhelm 2004). However, understanding the views of students with respect to these evaluations is important as students' willingness to use the evaluation method is directly related to their satisfaction from the evaluation process and the course (Chen and Hoshower 2003, Dommeyer et al. 2002a, Leong 2005). Accordingly, the remainder of this paper describes two empirical studies aimed at *identifying students' perceptions of the critical success factors of online teaching evaluations and the implications of these perceptions for faculty and survey designers.*

3. Students' perceptions of SET

The following sections describe the empirical studies conducted using a preliminary survey followed by a Delphi-like study with two student panels – one consisting of

undergraduate business students and the other of MBA students at a large Canadian university. Results are summarized and discussed in subsequent sections. The undergraduate students who participated in the Delphi study were at their second or higher year of study, with an average age of 20 years. 43% of the panel members were male. The MBA students who completed the initial survey were in their first year of study, and those participating in the Delphi study had completed at least one semester in the program prior to the time of the study. The average age of the MBA students was 27, with an average 4 years of employment prior to joining the program. Of the MBA panel members in the Delphi study, 60% were male. The specific school in which the study was conducted did not offer online SET at the time of the study and all classes were campus-based. For the most part students did not have experience taking online courses.

3.1 Study 1: Survey of Students' Perceptions

In order to gain some initial insights into students' overall perceptions of SET and the use of online tools we administered a survey in the winter term of 2006 to 119 MBA students across three sections of the Introduction to Information Systems course, a core course at the MBA program. The survey consisted of five open questions with the first two focusing on current practices and reasons for completing SET and students' perceptions of the importance of the evaluations to them. The other three questions focused on a proposed online teaching evaluation system, asking students to rate their likelihood of using such a system, describe their major concerns about using the system, and provide ideas on how to encourage adoption among students.

80 students completed our survey (a response rate of 67%) with 46 respondents indicating they have completed paper-based SET in past courses, and 34 indicating that they have not done so. Of these 34 students, 29 had just started the program and thus had not yet had a chance to complete such evaluations. The remaining five students felt that the paper-based SET they were given in past courses were too long and tedious, and thus they opted not to complete them.

In elaborating on why they did complete the evaluations, the majority of students indicated that they desired to improve teaching in the school (43%) or that they felt their feedback and opinions were important (40%). The remaining students noted that the SET survey was mandatory and on class time (7%), can help future students (4%), highlight outstanding faculty (4%), or contribute to the integrity of the school (2%).

Responding to the more general question of whether they thought the SET surveys were important, 70 students (89%) answered in the affirmative. The main reasons explaining why surveys were perceived as important are shown in Figure 1. Reasons for perceiving SET as not important included beliefs that evaluations serve only the instructor, that no visible action is taken following the evaluations, and that administering evaluations at the end of the term is irrelevant for current students.

The final question focused on online evaluation systems and asked students about their concerns with using such an information system and how the business school could enhance its adoption among students. Figure 2 shows the main concerns expressed by students (“none” means students

did not feel that there were any concerns). Finally, suggested methods for encouraging participation included providing class time (7%), making responses mandatory (5%), and

sending reminders (13%); making the system easy to access (10%) and use (7%), making the SET survey short (7%), and emphasizing privacy of students (5%); providing incentives

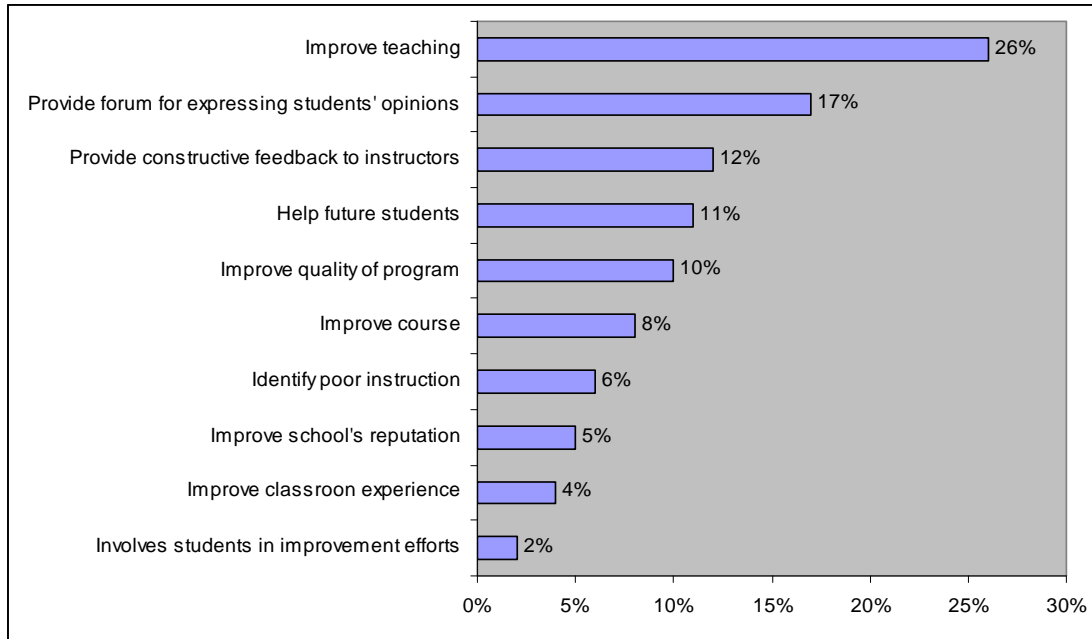


Figure 1: Perceived Importance of Students Evaluations of Teaching

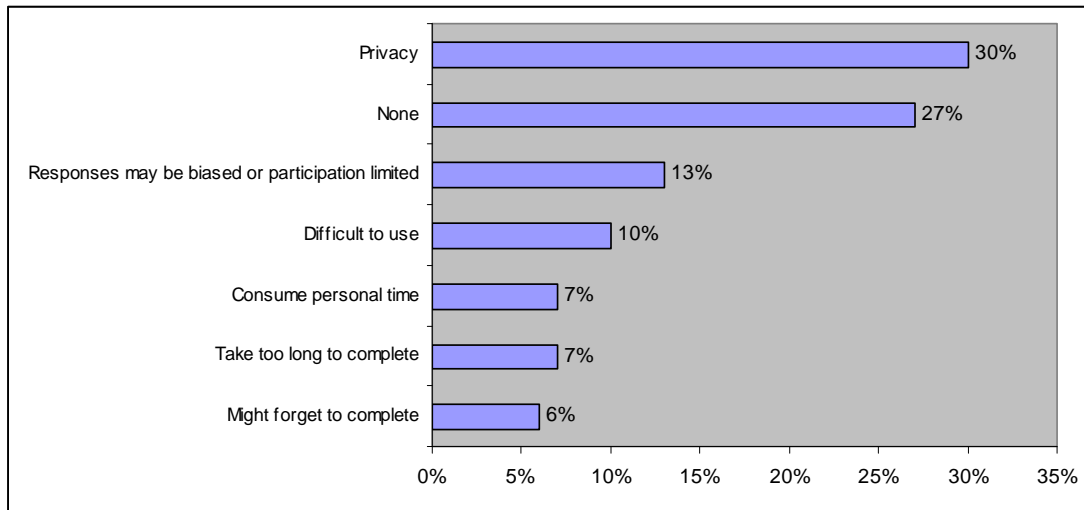


Figure 2: Students' Concerns about Using the Online Evaluation System

(26%); and emphasizing the benefits of the SET survey (7%).

The above responses provide important insights regarding current approaches of students to completing SET surveys and their overall attitudes towards the online evaluations system. Overall, our survey responses indicate that students mostly perceive SET as important and acknowledge their potential benefits. The responses also show that students are open to using online evaluation systems but share some concerns with respect to these systems that might inhibit overall adoption among students.

To further investigate this issue of students' response to online evaluation systems we conducted a second study using the Delphi technique and focusing on what students see as the critical success factors of an online teaching evaluation system. We describe this study next.

3.2 Study 2: A Study of Critical Success Factors of the Online System

Delphi is a method for exploring ideas or acquiring information from a panel of experts. It aims to obtain a consensus of opinions (or to identify outliers) with repeated

use of questionnaires and controlled feedback. Initially used primarily for forecasting, the Delphi method is widely used today to achieve group consensus about the relative importance of various issues (Schmidt et al. 2001). Generally speaking, a Delphi study consists of a panel of experts involved in a mediated brainstorming process intended to explore a particular topic.

The process used in this study followed the mediated brainstorming approach of the Delphi technique, and included two student panels. The first panel consisted of 30 undergraduate business students in their second or higher year of studies. The second panel consisted of 22 MBA students who have completed at least one semester of graduate studies. Thus, students in both panels were experienced with the process of teaching evaluations and with the process of selecting elective courses or course sections. Defining expertise in the context of this study to include knowledge of course offerings, course selection process, and teaching evaluations, we believe that the student members of both panels were suitable respondents for this study.

Following the procedures proposed by Schmidt et al. (2001) and Okoli and Pawloski (2004), the study included two main parts – a brainstorming phase intended to generate a list of critical success factors (CSF) for the online teaching evaluations process, and a ranking phase intended to identify the importance of each CSF. The procedure was identical for both student panels.

During the initial round of the study, panel members received an email with the following question: “From a student point of view, what do you believe are the critical success factors for adopting the online teaching evaluation system?” Panel members were further provided with the following: “An online teaching evaluation system is defined as a technology – or computer-based system – that enables students to provide feedback to instructors relating to courses taught.” The students’ point of reference for this process was the current teaching evaluation procedure in which paper-based questionnaires are administered at the beginning of the last class in the term.

Building on prior findings from the literature and from the MBA students’ survey (Study 1) we provided panel members with an initial list of CSF and asked that they add or remove items from this list. The initial list is provided in Table 1. After all responses to round 1 had been received, separate lists were created for added items and for items chosen by the panel to be removed. This was done for each of the two panels separately. For items added, two judges (the first author and a PhD student) sorted through the list and the definitions provided by panel members to combine any identical items added by different panel members. For items removed, a count of the number of panel members voting for removal was recorded for each item. The revised list of CSF, along with added items was then sent back to the panel.

The second round of the study asked panel members to pare down the list by selecting the eight most important CSF, in order of importance to them. After summarizing the ranks assigned by all panel members, the top ten items for each panel were selected to create the final list of CSF to be ranked in this study. The list of top ten CSF was again

emailed to panel members to solicit any comments concerning items which panel members felt must or must not be on the list of top ten CSF. No such comments were received.

Subsequent rounds of the study focused on obtaining agreement among panel members on the ranking of CSF. In each round, panel members were asked to rank items from 1 to 10 (1 being most important and 10 least important) based on what they perceived to be the most important CSF for the online evaluation system. Agreement among panel members was measured after each round of ranking using Kendall’s coefficient of concordance (W). Kendall’s W measures the strength of association among the ranking of items by multiple judges (Siegel and Castellan 1998). As a general guideline, scores closer to 1 represent a stronger consensus. Specifically, Schmidt et al. (2001) proposed that for Delphi studies, strong consensus exists for $W \geq 0.70$; moderate consensus for $W = 0.50$, and; weak consensus for $W < 0.30$. After two ranking rounds, agreement between the undergraduate panel members was 0.72 which is considered strong. The MBA panel required an additional ranking round to reach a sufficient level of agreement with Kendall’s W equal to 0.63, representing moderate to strong agreement. Although there was no strong agreement within the MBA panel we did not continue with another ranking round. Upon further examination of the rankings we observed that removing two judges increases agreement among the remaining 20 panel members to 0.73. One of the two judges ranked ‘anonymity’ as least important and the other ranked ‘SET survey redesign’ as most important. These were the key sources of disagreements with the rest of the panel.

4. FINDINGS FROM THE STUDY

Table 2 below provides the top ten CSF as identified by both the undergraduate panel and the MBA panel (1 being the most important and 10 the least important). While most items identified by the two panels overlap (specifically, 8 of the 10 items were shared by both panels), some ranking variations existed. We discuss these variations in more depth in the next section.

5. DISCUSSION

The studies described in the previous section provide interesting insights in terms of increasing students’ responses to online SET. This section pulls together these insights to provide a summary of the critical success factors for increased SET survey responses. These insights provide an important contribution for faculty and universities, as low response rates and concerns about the accuracy of responses and non-response bias are the main reasons for faculty’s hesitation to adopt the online SET (e.g. Dommeyer et al. 2002b). To facilitate the discussion of the insights obtained from the study we group together similar CSF based on their implications for survey administration and design. In grouping CSF, two of the authors and a PhD student carefully reviewed the definitions of items as well as the comments provided by panel members (some of which are shown in Table 3) and considered the implications of each CSF to faculty and administrators. The three judges then

Critical Success Factor	Definition/example
Class time	Evaluations to be completed on class time.
Make mandatory	Completion is mandatory: examples can include making it part of final assignment; final grade is conditional upon completion.
Provide incentives	Incentives are provided: for example, a participation mark for completion or a draw to win a prize.
Easy to use	Evaluation system is easy to use (e.g., easy to navigate the system).
Flexibility	Do not insist on completeness: SET survey can be submitted without answering all questions.
Privacy	Clear demonstration of how privacy/anonymity is assured.
Accessibility	The system is quickly and easily accessed.
Reminders	Send automated reminders to complete the SET survey.
SET survey design	Intuitive questions, short and concise question format.
Value	Highlight the value of completing the evaluations.
Deadline	Make time frame for completion short to avoid procrastination.
Reporting	Provide results to students in a timely manner.
Repetition	Allow evaluations at different (multiple) points in the term.
Technical reliability	Ensure no technical difficulties with the system.
Two-way feedback	Publish instructor responses to evaluations.
Paper option	Give option to complete paper forms if desired.
SET survey length	Limit the length of the SET survey and be honest about length. Provide feedback on progress through the questionnaire.
Security	Students' evaluations secured from hacking and tampering.

Table 1: Initial List of CSF based on Prior Survey and Literature

CSF	Definition	Undergraduate panel ranking	MBA panel ranking
Changes over time	Over time and when applicable, instructors should make visible changes to the course based on students' feedback.	1	6
Anonymity	Assure anonymity of responses (e.g., user IDs that are not tied to students' information).	2	1
Incentives	Provide incentives for completing the SET survey (e.g., participation marks or prize draw).	3	
Easy to use (SET survey)	Ensure that the SET survey is easy to complete (e.g., questions are clear and easy to understand; short and concise question format).	4	2
Accessibility	Ensure that the SET survey is easily and quickly accessible (e.g., provide links on course and school websites).	5	3
Publish results	Publish the results of the SET survey to all students (e.g., create a webpage that summarizes survey results for all courses and instructors).	6	5
Brief SET survey	Ensure that the SET survey is brief.	7	7
Easy to use (system)	Ensure that the evaluation system is easy to use (e.g., clear interface; demo on how to use the system).	8	4
Convey importance	Make students aware of the importance of the SET survey to the school and students.	9	9
Repetition	Implement the SET survey several times over the term (i.e. ongoing feedback).	10	
System reliability	Ensure that the evaluation system is working properly and reliably (e.g., no down time or errors; SET survey loads well).		8
Redesign SET survey	Carefully redesign the evaluations survey (take into account factors such as the individual course; instructor; environment; and personal comments, allow for different question types; etc.).		10

Table 2: Critical Success Factors Identified by Both Panels

discussed their grouping until agreement was achieved. We discuss each of the five groups in more depth below.

5.1 Group 1: Anonymity

Overview: When it comes to online SET, anonymity is often identified as a concern for students (e.g. Moss and Hendry 2002, Dommeyer et al 2004). Anonymity was highly ranked by both MBA and undergraduate students in this study with comments made by students highlighting the need to not only ensure anonymity but also convey this information to students. In addition, students strongly linked anonymity with honesty in responses. Table 3 offers some quotes to illustrate this point.

Implications: While there are many technical ways to ensure anonymity (consider for example the practices used for online voting (Nevo and Kim 2006)), the problem is how to convince students that anonymity is indeed maintained. The need to use some form of identification is crucial for SET survey design and administration in order to ensure that only students registered in the course are the ones responding and that students respond to the survey only once. In addition, if incentives are offered (as will be discussed below) the need arises to identify students to receive such incentives. Potential methods to ensure and convey anonymity can include using a trusted third party to administer the SET survey, or developing a mechanism for random assignment of user IDs to students.

Going back to the diffusion of innovation literature (Rogers 2003) and to the conclusions of Avery et al. (2006) that adoption of the online method is likely to increase with use, it is also probable that anonymity will become less of an issue once the technology is embedded and used for some time.

5.2 Group 2: Easy to Use (SET Survey, Online System), Brief SET Survey, Accessibility, and Reliability.

Overview: These CSF are grouped together as they all reflect the higher-level issues of time and mental effort spent on completing the SET survey. Ease of use has been shown to be an important antecedent of technology adoption (e.g., Davis 1989, Venkatesh et al. 2003), and indeed ease of use indicators were identified as important by both panels.

Implications: Group 2 of CSF is mainly targeted at SET survey administrators but is not expected to pose a great challenge as it is easily accomplished by most course management or online survey technologies available today. Nevertheless, this group captured 50% (40% for the undergraduate panel) of the top ten CSF list, highlighting the importance of proper survey administration. Moreover, as one MBA student commented, first impression is crucial for this group of CSF: *I believe that this is important only the 1st time, then the student learns and it is no longer critical.*

Another interesting insight in this group of CSF concerns the brevity of the SET survey. One MBA student commented: *A brief survey would help students to complete the survey faster, but sometimes without a clear explanation it'd be even harder for students to complete the survey,* thus identifying a subtle trade-off between brevity and ease of completing the survey. We will touch more upon this point when discussing the SET survey redesign CSF in group 5.

5.3 Group 3: Publish Results, Changes Over Time

Overview: This group represents two roles of SET as noted by Schmelkin et al. (1997): the *formative* role of providing a feedback mechanism for faculty for instructional improvement; and the *informative* role of assisting students in selecting future courses. As far as the undergraduate panel was concerned, making changes to the course in response to students' evaluations was perceived as the most important success factor. Such finding augments prior research (e.g., Chen and Hoshower 2003) about the perceived importance of the formative role of SET to undergraduate students.

To the extent that these two items represent the perceived usefulness of the online SET, this finding is also in line with information systems adoption literature, which recognizes perceived usefulness as critical for IS adoption (Venkatesh et al. 2003). It is interesting to note that the MBA panel placed, on average, greater importance on the ease of use factors as opposed to the usefulness factors, while the undergraduate panel chose a reverse ranking. As one MBA student framed his choice of ranking the CSF "publish results": *I had ranked this as number 1 before, but I suppose that unless the other 4 above are addressed, this won't be important. The most relevant thing I think is to help students pick courses. The difference between the CSFs is that some are "strategic" like this one, and others are operational. I think strategic considerations are MORE important, and the others are just must dos...*

Implications: Group 3 highlights the importance of faculty's buy-in of the SET process and faculty and administration's willingness to respond to the feedback from the students. The two CSF in group 3 bring forth the need to devise guidelines to aid faculty in deciding how to respond to the feedback obtained from students, and to determine the institution's policy concerning the publication of the SET survey's results, especially considering their role in tenure and promotion decisions. Related to the above, another possible implication stems from the recognition of students' expectations in terms of outcomes and the need to properly manage such expectations for improved adoption.

A final note with respect to publishing the results of the SET survey: Moss and Hendry (2002) found that revealing survey results at the end of the survey is seen as an incentive to complete the survey, which leads us to our next group of CSF.

5.4 Group 4: Incentives, Convey importance of SET Survey

Overview: While both panels ranked the CSF "Make students aware of the importance of the survey to the school and students" as ninth on the list of top ten, the undergraduate students ranked "provide incentives" as third (albeit, with a high standard deviation) whereas the MBA students did not include this item on their top ten list. Let us first understand the reasons for the MBA students' panel to exclude this item. First, as we noted earlier, incentives may violate anonymity (at least in perception). Second, the MBA students noted that providing incentives might also cause people to complete the SET survey for the wrong reasons and provide biased responses. Thus, while incentives may increase adoption they might also lead to some response

CSF group	Panel quotes
Group 1: Anonymity	Students will find it difficult to provide real feedback if their anonymity is not assured (undergraduate student). This is number one because you will not receive honest responses if students' identities are not kept private (undergraduate student). Most important factor for the success of the [SET] survey. Anonymity is a must to get unbiased response (MBA student).
Group 2: Easy to use (SET survey), easy to use (system), brief SET survey, accessibility, reliability.	Rankings 1-4 are related with "easiness" to me, and they are always the most important ones for me (MBA student, referring to the items in the left column) Since it is online and voluntary, if the [SET] survey is not brief, people may decide not to complete it or even take it (MBA student) A clear and easy interface would help students to complete the SET survey faster so they are willing to do the survey online (MBA student) [SET] survey needs to be short, clear and concise for students to be willing to complete (especially if it is done on their own time and not during class) (undergraduate student) This is way more important than receiving prizes! If the SET [survey] is unclear, the results would be misleading because students would not be interpreting the questions correctly. If the survey is long, the results are useless because students lose their patience and stop making thoughtful responses (undergraduate student) If students can't easily access the [SET] survey, it won't matter how clear it is (undergraduate student)
Group 3: Publish results, Changes over time	If students' comments do not lead instructors to make changes, students won't see the use of giving comments or evaluations (MBA student) The real value would be that the courses should change and improve with students' feedback (MBA student) Without any visible changes students may quickly lose faith in the [SET] survey (MBA student)
Group 4: Incentives, Convey importance of SET survey	In order to give away prizes you need to track who completes the SET surveys, this would violate the anonymous principle and potentially lower the level of honesty in the responses for fear of retribution (MBA student) I think we would all like to improve the teaching level therefore by providing incentives, some might just give the highest mark quickly only to get it over with and receive the incentive (MBA students) Participation should be freely given: incentives would result in higher rates of return, but not from those who *really* had something to say. Result skewed due to sloppy completion for speed goal to get incentive, instead of care for providing clear communication (MBA student)
Group 5: Redesign SET survey, Repetition.	One-size-fits-all [SET] surveys do not reflect the diverse nature of coursework in the program. The quality of the survey is highly important (MBA student) There should be constant feedback so that it is possible to see if there are improvements by the end of the term on areas that the instructor is weak at (undergraduate student)

Table 3: Quotes from students concerning the ranking of Critical Success Factors

bias, as adoption may arise for the wrong reasons (incentives or compliance versus providing genuine feedback).

Now let us turn to see what the undergraduate students' panel identified as important with respect to incentives. First, we note that there was some level of disagreement on the importance of this item, with students assigning lower ranks mainly citing the same arguments as the ones made by MBA students concerning the quality of responses. Students ranking incentives high on the list generally made the very simplistic comment of: *No incentives = no reason to do the survey* (although the item "make survey mandatory" was dropped by both panels at an earlier stage of the study).

Implications: Incentives, in general, present a challenge to survey designers (not only in the context of SET) and have been widely discussed, with mixed findings, in past literature in this context. For example, Porter and Whitcomb (2003) note that lottery incentives of up to \$200 did not seem to significantly impact response rates of college applicants,

although modest evidence was provided to suggest that the lottery incentives may have slightly impacted the care taken in completing surveys (fewer incomplete items) with no impact on mean item responses. On the other hand, Dommeyer et al. (2004) found that for undergraduate students, an incentive as small as a 0.25% grade change has led to a significant increase in response rates for online SET. In their study, again, average paper and online scores were not significantly different even when incentives were used. The effect of incentives is yet to be determined in the context of online SET as well as what the most effective type of incentives would be, and as our study shows, there is also the issue of matching incentives to the student population. Overall we note that given our findings of differences between the two panels and the high variation with the undergraduate panel, and given the findings of previous studies, more work is needed in order to understand the true impact of incentives on response rate and quality.

5.5 Group 5: Redesign SET Survey, Repetition.

Overview: Repetition was the item ranked last by the undergraduate students' panel and redesign was the item ranked last by the MBA students' panel. Both items were selected by only one of the panels. Despite their low perceived importance, we find these items to be one of the most interesting outcomes of this study. Indeed, often-times when a new information technology is implemented, such as online SET, administrators neglect to take into account new capabilities offered by the technology which may change the nature of the original process (e.g., paper-based SET). We believe that the desire for such redesign is reflected in these two items, and that it is crucial for the success of online SET, for example in realizing the relative advantage discussed at the beginning of this paper.

Implications: many universities are considering the move to online SET and are now at the position to rethink the feedback process before implementing a new system. The key implication of the CSF in group 5 is for universities to redesign the process currently institutionalized in existing paper-based SET practices and adapt it to the online environment with its new capabilities. For example, universities may leverage the scalability of the online environment which enables administering the SET survey at various levels: within a single class, across sections of the same course, at the department level, or at the university level. A holistic redesign approach which includes the needs and views of all relevant stakeholders is thus the key implications of this final group of CSF.

6. CONCLUSIONS

In this paper we discussed two important aspects of online SET. First, building on the importance of feedback to faculty, we discussed in depth how online SET may offer relative advantage over traditional paper-based surveys due to their inherent ease of use, flexibility, and cost effectiveness. Second, given the structure of academic courses that puts the onus of providing feedback mainly on students, we identified and discussed critical success factors (CSF) for increasing the response rates to online teaching evaluation surveys.

Our findings indicate that while current applications of online SET and paper-based SET fare quite similarly in terms of the CSF (e.g. paper SET provide the impression of greater anonymity but online SET are more convenient and easy to use), online SET have *a much greater potential* to provide value to faculty and students on CSF such as the immediacy of the feedback, the flexibility of their design, and the application of feedback. By redesigning the process of SET to become an ongoing procedure and by offering faculty and students the ability to customize their own surveys (or portions of the survey) online SET can offer a clear value to all stakeholders. Obtaining a similar outcome through the use of paper-based SET is likely to be very costly and difficult to administer.

It is worth noting that many of the CSF identified in this study are not limited to the online context but may also hold true for paper-based SET. For example, the desire to see the results of the survey in a timely manner, the need to convey the importance of the survey to students, or the redesign of

the survey are also likely to enhance adoption in the offline context. In this sense our study offers a contribution to the current practices of paper-based SET. What we discuss in this paper, however, is that such changes are more easily implemented using online SET due to their abovementioned relative advantage over paper-based SET.

Our empirical study is limited to a single business school and some of the CSF (e.g., the role of incentives) may be more important to business students. Nevertheless, throughout our analysis we compared and contrasted our insights with findings from past literature (where available) to demonstrate the validity of our findings. Moreover, we note that the MBA students in our study have completed their undergraduate degrees in a variety of disciplines and that the undergraduate students enrolled in courses offered by other faculties within the university. Future research can further explore the existence of differences in online SET applications at different departments, education levels, schools, and cultures.

Our study shows some differences between the items ranked by the undergraduate and the MBA panels. In particular, two items on each list were not included in the other list (incentives and repetition for the undergraduate students and reliability and redesign for the MBA students). In addition, MBA students, on average, ranked the more technical/operational items higher than undergraduate students. Thus, the most important items on the MBA list were anonymity, ease of use, and accessibility while the undergraduate students ranked anonymity, changes to the course, and incentives as the highest CSF. In attempting to shed light on these differences, we provided detailed quotes from students, explaining their reasoning for ranking the individual CSF. Future work can focus on differences between these two student groups and whether or not there is a need to administer different SET surveys, or to use different administration mechanisms.

This study focused on the point of view of students, which we believe is an important foundation to resolving several key limitations of successful online SET. Building on prior research, which identified response rates and non-response bias as the main concern for faculty, we see this study as offering an important contribution for faculty by identifying and discussing the factors critical to increasing response rates to online SET. Furthermore, we highlighted how online SET can be changed and applied to provide a stronger feedback mechanism to both faculty and students. Nevertheless, an additional hurdle on the way to successful adoption of online SET may still come from the faculty side and future studies may assess faculty's opinions more directly and compare what they view as critical success factors and required redesign of online SET.

Finally, universities should carefully consider a non-trivial redesign of the SET method upon the implementation of online SET, so that they can leverage the capabilities offered by the information technology and improve current practices. Simply transferring the traditional paper-based process onto the online environment fails to provide a clear relative advantage and thus is less likely to be widely adopted, at least within the current teaching environment of class based instruction.

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