Online vs. Paper Evaluations of Faculty:
When Less is Just as Good

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Abstract

Evaluation of teaching effectiveness is considered a critical element in determining whether or not faculty members are retained at higher education institutions; academic milestones such as tenure and promotion often require documentation of the quality of faculty teaching. As methods of assessing teaching effectiveness evolve, concerns about the equity of alternative methods arise. This study compared two methods of student evaluations of faculty, online versus the traditional paper format. Although the student response rate for online evaluations was lower, evaluation scoring patterns were similar for both methods. The findings suggest that conducting faculty evaluations online may be a suitable alternative to the traditional, paper-based approach.

Keywords: Course evaluations, student evaluations, faculty evaluations, online evaluations, evaluation of instruction.

Evaluations of teaching effectiveness are considered a critical element in determining whether or not faculty members are retained, especially at colleges and universities that emphasize teaching. Additionally, academic milestones, such as tenure and promotion, often require documentation of the quality of faculty teaching. As schools identify all of the costs associated with traditional paper methods of evaluation, online options become more attractive from an institutional standpoint because of the possible cost savings but also because of their efficiency and their environmentally friendly production.

But, as institutions consider moving to online evaluations, concerns of faculty may begin to surface regarding the lower participation rate anticipated with students who have the option of going online on their own time, and the fear that a lower participation rate will skew the results of the evaluations. Some may even be concerned that only students with a negative opinion of the instructor will take the time to go online to voice their views. Institutions need to determine the relative costs of online and paper methods of evaluation, but as importantly, they need to be able to address the concerns of faculty before implementing a new online system of evaluation.

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Literature Review

The emerging research comparing online with traditional student evaluations of teaching is showing that the results of the two methods are not significantly different (Layne, De-Cristoforo, & McGinty, 1999; Handwerk, Carson, & Blackwell, 2000; Sax, Gilmartin, Keup, Bryant, & Plecha, 2002; Dommeyer, Baum, Hanna, & Chapman, 2004; Avery, Bryant, Mathios, Kang, & Bell, 2006). Research designs typically compare two sections of the same class taught by the same instructor, one using the online method and the other paper in class (Thorpe, 2002). Through a comprehensive literature review, only one published study was identified that was based upon a research design in which students in participating classes were randomly assigned at the student level to one method or the other (Layne, DeCristoforo, & McGinty, 1999).

While the results of online and paper-based evaluation methods seem equivalent, the online response rate typically falls below that of the paper-based response rate. The continuum of responses reported in the literature ranges from 23% to a high of 92% (Ha, Marsh, & Jones, 1998), with around 50% being a commonly reported response rate (Avery et al., 2006; Brown, 2008).

Various factors may explain lower online rates. Since online surveys involve out-of-class time, students can be distracted and not remember or simply choose not to take the time to complete the evaluation (Laubsch, 2006). There may also be technical problems with accessing surveys online (Anderson, Cain, & Bird, 2005). Concerns persist about whether responses are anonymous (Layne, DeCristoforo, & McGinty, 1999; Dommeyer, Baum, & Hanna, 2002b), although this has long been a student concern about traditional methods of evaluation. Another study suggests that filling out numerous surveys may cause students to reach a saturation point and decline some or all evaluation opportunities (Sax, Gilmartin, & Bryant, 2003). Gender can also have significant bearing on response rates with some research showing that more women than men were likely to complete online evaluations when compared with paper (Thorpe, 2002). One study on who responds to online evaluations also found that students with higher grade point averages were more likely to complete surveys as were sophomores as compared to seniors who tended to have the lowest response rate (Layne, DeCristoforo, & McGinty, 1999). Even class size can be a factor. Students in larger classes were found to have a lower response rate than those in smaller classes (Avery et al., 2006).

On the other hand, research on student perceptions about online evaluations show that most students clearly prefer the online method (Layne, DeCristoforo, & McGinty 1999; Donovan, Mader, & Shinsky, 2007). It is more flexible because it is done on the student's own time schedule. The convenience and lack of time limits have also allowed for longer and more constructive responses to open-ended survey questions and students perceive this as an advantage to the online method (Dommeyer et al., 2002a; Ravelli, 2000; Anderson et al., 2005; Donovan, Mader, & Shinsky, 2006, 2007).

Faculty seem more cautious about online methods of evaluation according to one study that found that a strong majority of faculty preferred traditional methods of evaluation

(Dommeyer et al., 2002a). Faculty are concerned about the prospect of lower response rates and question whether online data will be as accurate as that from the traditional in-class approach.

A number of studies suggest that the response rate can be influenced by a variety of incentive strategies. In one study, a grade incentive was used, one-quarter of 1%, and this increased the response rate to be comparable to a paper survey in class (Dommeyer et al., 2004). Other incentives, cash or prizes, can also increase the response rate (Bosnjak & Tuten, 2003; Cobanoglu & Cobanoglu, 2003). Others show positive gains using reminder messages (Crawford, Couper, & Lamias, 2001). There is also evidence that once an online system has been implemented, over time the response rate will gradually increase (Avery et al., 2006).

Finally, one study showed that increased response rate correlated with the degree of involvement of faculty and department heads in developing the survey used online (Anderson, Brown, & Spaeth, 2006). The authors suggest more generally that faculty and administrative support for assessment and intentional engagement of students in assessment efforts is a key to making an online system successful.

Study Purpose

While the literature provides insight into the impacts of conducting faculty evaluations via online methods, research methods and results are not uniformly consistent. Accordingly, this research study was initiated to add to the body of knowledge on two of the primary research questions. Do response rates differ between online and paper-based evaluation methods? Do scoring patterns differ between online and paper-based respondents? Given the uses of evaluations data, answers to these research questions will be of interest to faculty and administrators who have implemented or are considering implementing online course evaluations.

In 1999, Layne, DeCristoforo, and McGinty conducted a study which focused on a southeastern university enrolling 12,000 students, mostly in engineering-related programs; the study design was based upon random assignment at the student level. The present study involves a smaller university, a larger number of courses and almost double the number of students involved in the prior study. Perhaps more importantly, the courses represent nearly every program in the institution: humanities, arts, business, education, nursing, science, etc. By targeting a broader span of academic programs, the present study strives to provide a more comprehensive assessment of alternative methods of faculty evaluations.

Findings from this study will inform research and practice regarding the equivalence of online and paper evaluations.

Methods

Setting

This research study was conducted on the central campus of a private university in the southwest US. The campus is located in an urban setting and serves both residential and commuter students. The primarily teaching university provides a wide variety of academic programs including undergraduate, graduate and first professional degree programs; it awards baccalaureate, masters and doctoral degrees. The university maintains a low student-faculty ratio of 14 to 1; many course sections have fewer than 20 students. During the 2008-09 academic year, approximately 4600 students enrolled in courses on the central campus. Student enrollments reflect a diverse ethnicity; the university is designated a Hispanic Serving Institution by the US Department of Education. At this institution, all undergraduate students are required to own laptop computers thereby facilitating the opportunity for online activities for students; computer literacy is a core competency emphasized across the curriculum.

Research Design

To assess the response rates and scoring patterns of online and paper-based evaluations, a prospective, two-group randomized study design was implemented. Evaluations were conducted using either paper-based or online evaluation instruments. The online evaluation instrument, developed with CoursEval™ software, was crafted such that it contained the same items and used the same scoring metrics as the paper-based instrument; the instruments were equivalent with respect to content.

The evaluation instruments contained 18 items representing course attributes, 5 items describing self-reported student characteristics (e.g., GPA, expected grade in course), and 6 items requesting comments. The 18 items representing course attributes were scored using a Likert five-point scale with scores of 1 through 5 representing strongly disagree, disagree, neutral, agree and strongly agree, respectively. All 18 items were written in a manner such that low scores were undesirable and high scores were desirable. For the 18-item scale, the best outcome possible would be represented by a score of 5 on each of the 18 items; the least desirable outcome would be represented by a score of 1 on each of the 18 items.

Evaluations were conducted during roughly a two-week period in the spring 2009 semester. Prior to distributing the evaluation instruments, students enrolled in course sections were randomized at the student level to participate in either paper-based or online evaluations. Through the randomization process, each student enrolled in a course section had an equal probability of being assigned to either the paper or online evaluation method. On the date that evaluations were to be conducted within a classroom, the instructor exited the classroom, a student monitor administered the paper-based preprinted forms to the students selected for the paper-based evaluation, and the student monitor provided written instructions for the students selected for the online process. Students selected for the online process left the classroom while the students selected for the paper-based method remained and completed the evaluations; students selected for online evaluations

were sent emails with additional instructions for completing the evaluations. Since instructors of the courses were not present during the evaluation process, the instructors were not aware of which students were assigned to the paper-based or online methods. Students who were selected to participate in online evaluations were required to use a user ID and password; only students selected for online evaluations were allowed to complete online evaluations, and controls prevented the students from submitting more than one evaluation per section. Since many students were enrolled in more than one course, the students may have participated in paper-based evaluations in some courses and online evaluations in others.

The controls implemented in the evaluation process provided assurance that students in the two groups (i.e., online, paper) had equivalent opportunity to participate in the evaluation process while maintaining anonymity. The randomization process provided assurance that the two groups were homogeneous. The instruments were designed to assure that the evaluation metrics were equivalent.

Sample

Eighty-one instructors teaching a total of 247 course sections were evaluated. The course sections included in the study were those taught by tenure-track or tenured faculty. Course sections taught by adjunct faculty were not included in this study. Also, courses that did not meet for the 16-week semester (e.g., accelerated courses) and courses that met only at clinical sites were excluded from the study. Course sections evaluated were drawn from all of the schools within the university, and from all course levels (i.e., freshman through graduate). A total of 4550 student enrollments were assigned for participation in the study; 2270 were randomly assigned to the online evaluation group and 2280 were assigned to the paper-based group.

Analysis

Paper-based responses were scanned to electronic format and exported to SPSS 16.0 for analysis. Online responses were similarly exported to SPSS. The response datasets were merged, and data cleaning was conducted for quality assurance. Chi square tests were used to determine if response rates differed between the online and paper-based evaluation methods and to assess differences between self-reported student attributes on items 19 through 23. To determine if scoring patterns differed between online and paper-based respondents, mean scores (i.e., means of the 18 items) were calculated for each respondent. These mean scores, which could range from a low of 1.0 to the high of 5.0, were compared between the online and paper-based groups using Student's t test. Additionally, mean scores on each of the 18 items were compared between the online and paper-based groups using Student's t test with a Bonferroni adjustment. Comment lengths on items 24 through 29 were also compared using Student's t. Cronbach's alpha was used to determine the internal consistency for the instruments. Two-way analysis of variance was used to evaluate the effects of course grade level (e.g., freshman, sophomore) and evaluation method (i.e., paper, online) on evaluations scores. For all analyses, the level of significance is 0.05.

Results

Response rates for online and paper-based methods differed. For the online evaluation group, a total of 1229 responses were submitted yielding a response rate of 54.14%. For the paper-based evaluation group, a total of 1557 responses were submitted yielding a response rate of 68.29%. These response rates differed significantly (Chi-square = 95.921, *df*=1, *p*<.001). Accordingly, the online response rate was lower than the response rate for paper-based evaluations. As depicted in Figure 1, online response frequencies varied daily, with notable increases when email reminders were distributed on February 23, March 2 and March 5.

Figure 1. Online Response Frequencies by Date
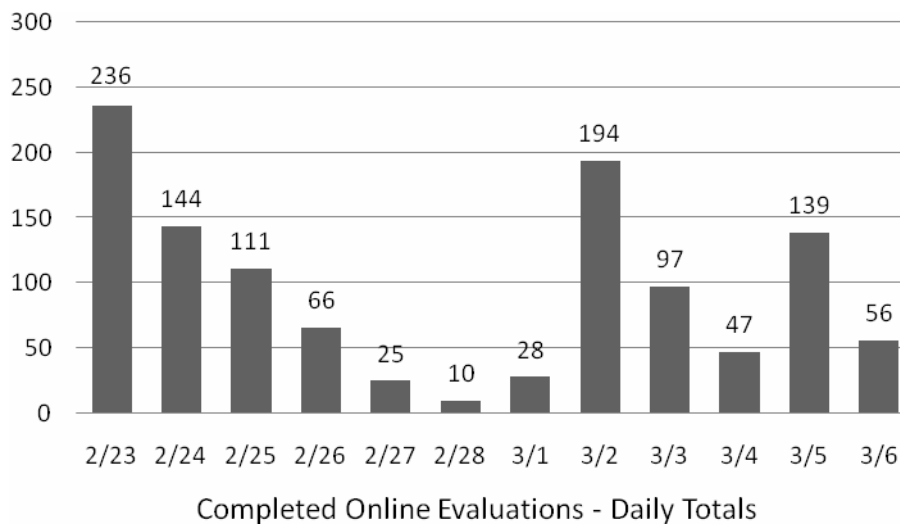
Of the students who completed evaluations, as revealed in Figure 2, scoring patterns as reflected by mean scores were strikingly similar between the online and paper-based groups. By far, the most common scoring pattern for both groups was ratings of 5 on all of the 18 items on the evaluation instrument. A small percentage of evaluations yielded a mean score that fell below a neutral score of 3.0. Although there was some detectable variation between the scoring patterns of the two groups, Figure 2 does not reveal any substantial bias between the methods.

Scores for the online and paper-based groups were 4.33 ± 0.67 (Mean ± SD) and 4.40 ± 0.64, respectively. These means differed significantly (*t* = 2.872, *df* = 2784, *p* = .004) with a 95% confidence interval for the difference of (.02, .12). Using Glass's Δ, the effect size was 0.11. Mean scores for the online group were approximately 1.6% lower than scores for the paper-based group.

For each of the items on the 18 item scale, mean differences between paper and online scores varied from a low of 0.03 to a high of 0.16. Using Student's t test with a Bonferroni adjustment, only one of the 18 items produced mean scores that differed between

Figure 2. Frequencies of Mean Scores by Online and Paper-Based Responses
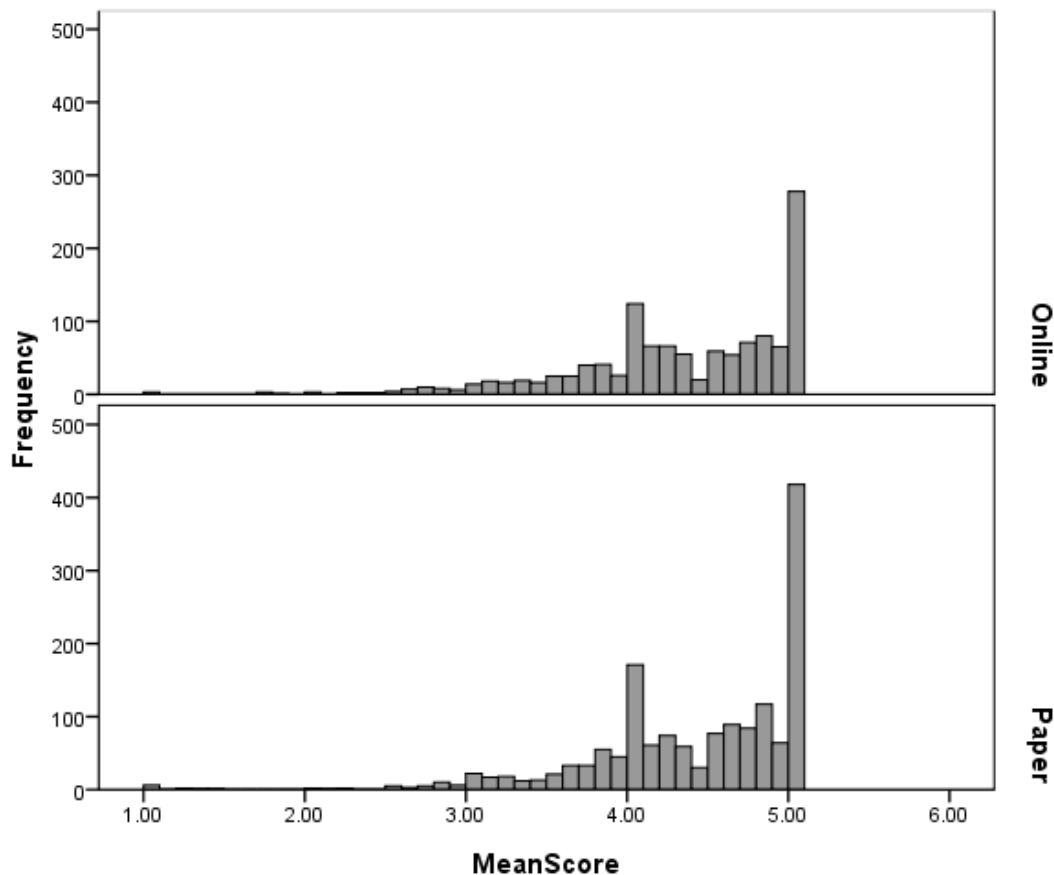
the online and paper-based groups in a statistically significant manner. Thus, individual item scoring patterns between each of the two groups were generally consistent.

Responses on items 19 through 23 describing self-reported student characteristics were analyzed. A key findings was that the online group reported spending more "out of class" time on the course (Chi square = 12.181, *df* = 4, *p* = .016). Forty-two percent of the online respondents reported spending 4 or more hours per week on the course; only 37% of the paper-based respondents reported spending 4 or more hours per week. Another key finding was that 55.5% the online respondents were enrolled in junior-senior level courses compared to 50.1% of the paper-based respondents (Chi square = 10.435, *df* = 4, *p* = .034).   For each of the two groups, 92% of the respondents expected to receive a grade of A or B for the course.

Comment lengths on items 24 through 29 were compared to see if differences existed between the online and paper-based groups. Mean comment lengths differed on all of the items 24 through 29 (p < .001 for all questions). In all cases, students using the online method tended to provide more lengthy comments.

To assess the internal consistency of the evaluation instrument, Cronbach's alpha was calculated. Cronbach's alpha was 0.968 for paper-based evaluations, 0.963 for online evaluations, and 0.965 for the combined set of evaluations, indicating a high degree of reliability among the 18 items and consistency between both methods of evaluation.

To test the effects of course grade level (e.g., freshman, sophomore) and evaluation method (i.e., paper, online) on mean evaluations scores, a two-way analysis of variance was implemented. Evaluation scores, stratified by course grade level and evaluation method, are presented in Table 1. Main effects for course grade level ($F = 9.431$, $df = (4, 2727)$, $p < .001$) and evaluation method ($F = 6.124$, $df = (1, 2727)$, $p = .013$) were significant; the interaction effect was not significant. Post hoc tests reveal that freshman and sophomore level courses had significantly lower mean evaluation scores than junior and senior level courses. Furthermore, when assessing differences in evaluation scores by course grade level, differences between paper-based and online evaluation scores were only significant for sophomore level courses ($t = 2.487$, $df = 648$, $p = .013$).

Table 1. Evaluation Scores by Course Level and Evaluation Method (Mean ± SD)

Course Level	Evaluation Scores (Paper)	Evaluation Scores (Online)
Freshman	4.36 ± .682	4.29 ± .694
Sophomore	4.34 ± .661	4.20 ± .781
Junior	4.45 ± .603	4.41 ± .548
Senior	4.51 ± .591	4.47 ± .588
Graduate	4.38 ± .678	4.33 ± .612

Discussion

This study was initiated to answer two primary questions. The first questions was "Do evaluation response rates differ based upon the method of response (paper-based vs. online)?" The finding was that the online response rate (54%) fell below that of the paper-based response rate (68%). Though the investigators anticipated a higher paper-based response rate, the findings of the study are consistent with those from other institutions. Reasons for non-response on paper-based evaluations include student absences on the day the evaluation was administered, students self-selecting not to participate in the evaluations, and errors in scheduling/administration of the evaluations. Given that course section enrollments were generally less than 20, the difference in response rates between the two methods may be considered of practical significance. Thus, efforts to increase response rates should be pursued. As reflected in Table 1, online response rates can be increased when students are encouraged to participate. Students were sent email messages on February 23, March 2 and March 5 requesting that they complete online evaluations, and there were notable increases in response to the email reminders. This is consistent with prior findings that online response rates can be increased with directed efforts to encourage student participation.

This study also was initiated to answer the question "For the students who participate in evaluations of teaching, do scoring patterns differ based upon the method of response (paper-based vs. online)?" Figure 2 provides a graphical review of scoring patterns for the two response methods. The graph clearly displays a high degree of consistency in scoring patterns between the two groups. Only a small percentage of respondents by either method provided mean scores that fell below a neutral score of 3.0. The most common score for both groups was 5.0, with the majority of scores falling in the 4.0 to 5.0 range. This finding may help to assuage some concerns that those who self-select to respond via the online method may have a greater likelihood of being disgruntled or displeased with the instructor and thus submit low scores. In general, scoring patterns between the online and paper-based groups were similar.

Although scoring patterns between online and paper-based groups were similar, mean scores for the online group were marginally below those of the paper-based group. The online group had an aggregate mean score of 4.33 compared to 4.40 for the paper-based group. Thus, scores for the online group were about 1.6% lower than the paper-based group. Given the relatively small effect size, the difference in mean scores between the two methods is of limited practical significance. This finding suggests that the two evaluation methods produce roughly equivalent mean scores.

Scores were reviewed on each of the 18 items in the Likert scale. The scoring patterns between the online and paper-based groups did not differ in a statistically significant manner on 17 of the 18 items. This finding further supports the assertion that online and paper-based scoring methods generally produce comparable results. Also of interest, internal consistency of the 18 items was confirmed by a Cronbach's alpha of 0.968 for paper-based evaluations and 0.963 for online evaluations, indicating a high degree of consistency between the two evaluation methods and a high degree of reliability among the 18 items.

In this study, the students who responded by the online method tended to spend more time on the courses outside of class, and a higher percentage of the online respondents were in junior and senior level courses. The reasons for these differences are unknown. Perhaps upper-level students are more inclined to participate in online evaluations than lower-level students. Perhaps those students who spend more time on their courses are more focused or motivated and this may influence their likelihood of participating in online evaluations. Although the reasons for these differences are unknown, they may have some bearing on why there were minor differences in scoring between the online and paper-based groups. Further research to determine why online respondents differ from paper-based respondents is warranted.

In both the online and paper-based groups, 92% of the students who responded stated that they expected a grade of A or B in the class. This finding may suggest that students who expect to receive higher grades are more likely to participate in evaluations than those who receive lower grades. Alternatively, this may simply reflect a general expectation of all students. Additional research studying the association of grade expectations with participation and scoring of evaluations may help to clarify this issue.

Consistent with prior research, this study demonstrated that online respondents tended to produce more lengthy comments than paper-based respondents. Possible explanations are as follows. First, students may be able to key in comments more rapidly than writing by hand, so this provides an efficiency gain for the students. Second, without time constraints, students may be able to provide more detailed, informative comments. Third, students may be more comfortable with assurances of anonymity without their handwriting being present. Although our study does not reveal why the respondents provided more lengthy comments, the online method in this sense appears to offer an advantage over a paper method when evaluation questions are in an open-entry format. However, future studies will need to determine if longer comments necessarily provide qualitatively different information than shorter ones.

To further assess potential differences between online and paper-based responses, analyses were conducted at the course level (e.g., freshman, sophomore). As demonstrated in Table 1, mean scores for both online and paper-based evaluations were lower in lower-level undergraduate courses than in upper-level undergraduate courses. Additionally, differences between online and paper-based scores were of greater magnitude in lower-level undergraduate courses than in upper-level courses. In fact, differences in means scores between online and paper-based evaluations were only significant in sophomore-level courses. Thus, differences in mean scores between online and paper-based methods are most pronounced in lower-level undergraduate courses. Furthermore, differences by course level are more substantial than differences by evaluation method. Accordingly, while online and paper-based methods may yield marginally different results, this study suggests that factors other than the evaluation method (i.e., online, paper) may play a major part in differences in scoring patterns. The reasons why students in lower-level undergraduate courses may provide lower scores than students in upper-level undergraduate courses are unknown; this merits further research.

Implications for Future Practice and Research

As noted above, further research to explore reasons why online response rates and scoring patterns may differ from the paper-based method are needed. Furthermore, studies to address differences among online respondents are warranted. For example, are full-time students who enroll in multiple courses less likely to participate in online evaluations compared to students who are enrolled in fewer courses? Although many studies within the literature have explored differences among respondents, further research may yield additional insights.

From a practice perspective, the findings of this study suggest that online evaluations may be a suitable alternative to paper-based evaluations. Although online response rates are lower, they can be boosted with directed efforts of an institution. Furthermore, online evaluations tend to produce results roughly comparable to paper-based evaluations. Therefore, the online evaluation method should be considered as a viable alternative to paper-based methods.

Limitations

This study provided a comparison of online and paper-based methods of evaluations for full-time faculty teaching courses with relatively small enrollments in a private university setting; care should be taken when generalizing the findings from this study to other populations. Although this study demonstrated a high degree of consistency between online and paper-based scoring patterns, this study did not attempt to validate either online or paper-based methods. Furthermore, there may be factors other than those included in this study which have a significant influence on evaluation scoring patterns.

Conclusion

This study demonstrated that conducting online evaluations of teaching is a suitable alternative to the traditional paper-based approach. Scoring patterns for online evaluations are generally consistent with those of paper-based evaluations, thereby providing evidence that the online evaluation process is reliable. Faculty and university administrators who are considering the implementation of online evaluations of teaching should have a well-defined plan to yield optimal participation. To maximize student response rates, the administrators of the online evaluation system need to communicate effectively with the faculty being reviewed, so that they in turn can communicate with the students and encourage their participation. Based upon the review of the literature as well as the findings from this study, online evaluations are most effective when faculty and administrators "buy in" to the process, and when focused efforts are directed at encouraging student participation.

Some education needs to be part of faculty "buy in". As a minimum, faculty should be informed that empirical research demonstrates the practical equivalence of online to paper evaluations even if response rates are different, and that any faculty fear about an increase in negative student opinion online is unwarranted. Assuring students that their online responses will be anonymous can relieve a common fear and encourage their "buy in" as well.

Adopting a system of conducting online evaluations of teaching can yield many benefits including cost effectiveness, environmental friendliness, time efficiencies, and availability of robust analytical capabilities. Online evaluation should be considered as a viable alternative to the traditional, paper-based approach provided faculty and administrators agree to collectively and actively promote student participation.

Acknowledgements

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