Comparison of Traditional and Web-Based Course Evaluation Processes in a Required, Team-Taught Pharmacotherapy Course

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To improve the utility and efficiency of course evaluations, the traditional evaluation format was compared to a web-based evaluation process. In a team-taught course (enrollment = 169), students were randomly assigned to complete evaluations online (n = 50) or by traditional, paper-based methods (n = 119). Web-based and traditional evaluations were compared for Likert score, quantity and quality of student comments, student satisfaction, and consumption of staff and faculty time. Of 252 questions asked of each student, 72 (29 percent) had a significantly different Likert score. The number of comments was significantly higher in the web-based group compared to the traditional group. Students, faculty and staff all rated the web process as more convenient and less time-consuming than the traditional method. A web-based evaluation system using subsets of students to complete each evaluation can be employed to obtain representative feedback. The web-based process yields quantitatively and qualitatively superior student comments, enhanced student satisfaction, and more efficient use of faculty and staff time.

INTRODUCTION

Student feedback is considered an essential component to improve lecturer performance and assess overall course format. The reliance on student evaluations for course and lecturer improvement is not optimal, for a number of reasons. For instance, because of the processing required, results are usually provided weeks to months after the course is finished. This often leaves students to wonder if their feedback is ever read, much less utilized, and the lecturers unable to use the comments obtained for an entire year(1). Obtaining feedback on lecturer performance in team-taught courses is even more difficult because students are asked to recall individual lecturers in a course where they may have many different lecturers throughout the semester.

The evaluation system used in our team-taught pharmacotherapy courses at the St. Louis College of Pharmacy requires all students to fill out a 14 item paper evaluation (see Appendix) for each lecturer following each exam. Although the response rate is approximately 100 percent, this method has created some discontent among students because of the amount of time required to fill out each evaluation. This evaluation system also creates increased workload for support staff because all comments provided by students are individually typed and distributed to each individual lecturer. The purpose of this study was multi-fold. We wanted to first simplify lecturer evaluations for the students by reducing the number of times each student had to complete an evaluation. In order to do this, it needed to be determined if a smaller sample of students could provide comparable feedback to the entire class. The second goal was to improve the method of administering evaluations. We wanted to determine if completing the evaluations on the internet would be accessible, practical, and convenient for students, and if it would reduce the workload for staff.

METHODS

A website was designed in which the same tool used for the traditional paper evaluation system was placed on the Internet (see Appendix). Fifty students, randomly selected by student identification number, were asked to complete the evaluations using the web-based system following each of the four examinations throughout the semester. Students could access the website using their student identification number and a generic password that was assigned to them. Once students entered the website, they could change their password to ensure security. The coordinators could identify those students who had completed evaluations; however, they were blinded regarding the author of any specific evaluation. The remaining 119 students enrolled in the course completed traditional paper evaluations following each exam.

At the end of the semester, the web-based and traditional evaluation systems were compared for: (*i*) Likert score on each item; (*ii*) quantity and quality of student comments; and (*iii*) student satisfaction. Nonparametric statistical analysis using Mann-Whitney U tests were done for each individual question for each lecturer to determine if results from the web-based group were comparable to the traditional group. An a value of 0.05 was chosen for significance. To assess quantity, the number of comments submitted for each evaluation system was evaluated. Also, the number of words written per student for each evaluation system was calculated. Quality of comments were designated and evaluated by course coordinators and placed in one of six categories: (*i*) constructive criticism; (*ii*) positive feedback on things that worked well (*i.e.,* slide layout, charts, etc.; (*iii*) ideas of ways to improve lecture; (*iv*) ideas of ways to improve the course; (*v*) negative comments; and (*vi*) vulgarity. To assess the practicality, accessibility, and convenience of the web-based system, the following sample questions

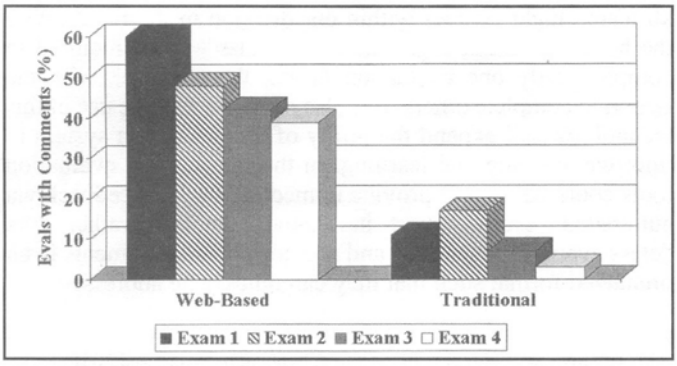

Fig. 1. Number of comments submitted.

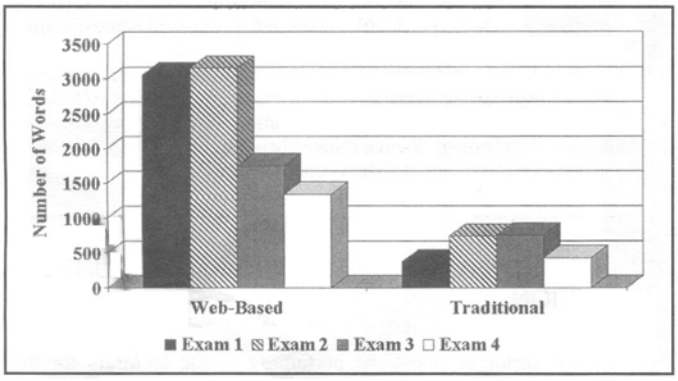

Fig. 2. Total number of words.

were included in the web-based evaluation tool: 1) Where did you complete this evaluation? (library, computer center, student center, work, home, other) and 2) Completing this evaluation took me _____minutes? *(e.g.,* <5, 6-10, 11-15, 16-20, >20).

At the completion of the semester, the course coordinators met with a volunteer subgroup of 10 students who had completed web-based evaluations to discuss the advantages and disadvantages of the web-based method. All students had previously used traditional methods in past courses.

RESULTS

Of the 252 questions asked of each student throughout the semester (14 questions x 18 lecturers), 72 (29 percent) of the questions had significantly different Likert scores between the web-based evaluation system and the traditional paper evaluation system ($P<0.05$).

Students using the web-based system submitted more comments (range 38.6 percent - 60 percent per exam) versus those using the traditional system (range 2.7 percent - 16.5 percent per exam) (Figure 1). Also, the total number of words typed per student using the web-based system was over seven times the number of written words per student using the traditional system (186 words/student vs. 25 words/student respectively) (Figure 2). Overall, the quality of comments appeared to be similar (Table I).

The students on average spent 10 minutes or less filling out the web-based evaluation compared to approximately 25 minutes using the traditional system. All students found the web-based system to be accessible through work, home or school computers. Feedback from the subgroup of 10 volunteer students using the web-based system was overwhelmingly positive. They felt it was easier to type more comments using the web-based system rather than manually writing on the paper

Table I. Comment content and quality

	Percent Traditional	Web
Constructive Criticism	41	32
Positive Feedback	28	43
Lecture Improvement	1	0
Course Improvement	7	5
Negative Comments	23	19
Vulgarity	0	0.5

evaluations. The subgroup also stated that it took less time to complete the web-based evaluations because once they were done typing comments they could submit their responses electronically, whereas when using the traditional system, they had to complete the evaluations and then physically return them to the instructors or staff.

Staff workload was decreased with the web-based system. At the end of the semester, it took one hour to download scores and comments from the web-based evaluations for all lecturers. According to staff involved in processing the traditional evaluations, it took approximately 30 hours to compile scores and comments for all lecturers from each evaluation.

DISCUSSION

This study demonstrates that the use of a web-based evaluation system in team-taught courses may be a much more efficient way to conduct lecturer evaluations than the traditional paper method. A small sample of students using the web-based system was more likely to write comments compared to the majority of the class using the paper evaluation system. Overall, the group using the web-based evaluations found the system much easier to use. This study also appeared to show that a smaller sample of students could provide comparable feedback to the entire class. When comparing questions by Likert score, 29 percent of the questions were statistically different. In all but two questions, however, the median and/or range was different by only one point and in most cases did not change the overall meaning of the response. For example, one question in the web-based group reported a median response of "Strongly Agree," whereas the median response for the same question in the traditional group was "Agree." The coordinators did not feel that this difference significantly changed the meaning of the evaluations from the two different systems. The increased variability may be due to the higher number of students using the traditional paper evaluation system compared to the web based system.

Several limitations to this study exist. First, only one course was involved in the study; however, there is no reason to believe that these results cannot be replicated in other courses. The second limitation is that one sample of students was used throughout the entire semester. Ideally, a different sample of fifty students would be chosen to complete the web-based evaluations following each exam to determine if any given sample could provide comparable lecturer feedback. Due to the large sample size, however, this may not be a limitation.

Strengths include the fact that the sample of students completing the web-based evaluations was randomly chosen. Also, the investigators were blinded to which students were in each group of evaluations. This prevented the investigators from encouraging one group to fill out evaluations more than the other.

After reviewing the literature, this appears to be one of

only a few studies to directly compare a web-based lecturer evaluation system and a traditional paper system. It also appears to be the first comparison between a random sample of students and the remainder of the class. A previous survey of the nation's 200 most "wired" colleges showed that only two percent of schools reported an institution-wide use of web-based evaluations. Many of the concerns expressed by academic institutions were related to a decrease in response rate when students completed evaluations on the Internet compared to the paper method administered in class(2). While this may be a concern for some institutions, literature suggests that online evaluations are feasible. Woodward compared a traditional in class evaluation to an online format of the same evaluation, and found no significant difference in response rates between the two groups (97 percent vs. 88 percent respectively)(3). Historically, we have required students to complete evaluations in the therapeutics sequence, thus prompting an approximately 97 percent response rate. Despite having a high response rate, the number of useful comments has historically been low. If it is possible to decrease the number of evaluations students must complete, while at the same time making them more simple and more convenient to fill out, we will hopefully increase the usefulness of the evaluation system while maintaining a high rate of return.

Another concern expressed in the literature about web-based evaluation systems is the lack of control over the administration of the evaluations. It has been suggested that students may be more likely to be influenced by friends and social situations if evaluations are completed at their leisure(4). Attempts to decrease that risk were made by giving the students a limited amount of time to complete the evaluation. For example, students have one week following an exam to complete the on-line evaluation.

Critical components of a good evaluation system include a valid and reliable evaluation tool, proper analysis, effective and timely reporting of the data, and correct interpretation of reports(4). Using a web-based system cannot guarantee this level of quality any more than a traditional paper-based system. However, we believe that the web-based system provides comparable, if not improved results to the paper-based system and decreases overall staff and student workload. We also believe that the web-based system allows for much more timely reporting of the feedback data. Future studies are planned in an attempt to replicate these results in multiple classroom settings. It is likely that web-based evaluations will be implemented in all team-taught courses within our division in the future, with the hope that small segments of the class will be required to complete only one evaluation during the semester, with the option to complete others. It is also our hope that the use of this technology will expand the utility of the evaluation system to improve teaching and learning. In the future, such evaluation tools could be used to provide immediate student feedback via automated results, report individual responses rather than "class average" responses, and present student comments in an organized format such that they can quickly be addressed.

References

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(3) Woodward, D.K., "Comparison of course evaluations by traditional and computerized on-line methods," Am. J. Pharm. Educ., **62**, 89S(1998).

(4) Theall M. "Electronic Course Evaluation Is Not Necessarily the Solution." Technology Source (November-December 2000), http://horizon.unc.edu/TS/default.asp?show=article&id=823.

APPENDIX. TH5001 THERAPEUTICS III LECTURE EVALUATION

Below are a series of questions pertaining to the lecturers for this module. For each box (1-56) please fill in the appropriate bubble (A-E) on the scantron sheet using a No. 2 pencil. We ask that you be as honest as possible and that you also provide suggestions to improve module/lecturer weaknesses on the space provided on the sacantron form. These comments will be reviewed by the course coordinators and lecturers and then used to make improvements in the course (both this semester and in future semesters). Note: evaluation forms that contain profanity or other objectionable language will be discarded and not included in the course evaluation results. The course evaluations will be reviewed by the coordinators/lecturers only after the midterm exam is returned. Although you should not put your name on the evaluation form/scantron, you must return them to Sandy in order to receive your graded midterm exam next week. Thank you.

For the statements below, use the following scale: 1 = Strongly Agree; 2 = Agree; 3 = Neither agree nor disagree; 4 = Disagree; 5 = Strongly Disagree

	Lecture			
Questions	**#1**	**#2**	**#3**	**#4**
a. The instructor's objectives for his/her module were made clear.	1	15	29	43
b. The instructor's handout materials were useful in learning the module.	2	16	30	44
c. The instructor was knowledgeable of his/her subject material.	3	17	31	45
d. Lecture content was presented in an organized manner.	4	18	32	46
e. Lecture content was presented in an understandable manner.	5	19	33	47
f. The instructor's visual aids (overheads, slides) were helpful in following the lecture	6	20	34	48
g. The instructor summarized or emphasized major points during lecture.	7	21	35	49
h. The instructor appropriately balanced pathophysiology and drug therapy during his/her lecture.	8	22	36	50
i. The instructor attempted to clarify material when students didn't understand.	9	23	37	51
j. The instructor answered questions well during lecture.	10	24	38	52
k. The instructor seemed genuinely concerned with student learning.	11	25	39	53
1. Examinations reflected the assigned study material and topics covered in class.	12	26	40	54
m. My interest in the subject area has been stimulated by this instructor.	13	27	41	55
n. Overall, I rate this instructor as excellent teacher.	14	28	42	56