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The relationship between problems with technology and graduate students' evaluations of online teaching

Mary K. Tallent-Runnels*, William Y. Lan, Wesley Fryer, Julie A. Thomas, Sandi Cooper, Kun Wang

College of Education, Texas Tech University, Box 41071, Lubbock, TX 79409-1071, United States

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Abstract

In this study the intent was to determine if the problems with technology that graduate students experience in online classes is related to their evaluations of their instructors. Participants included 131 graduate students in a College of Education. They were from 19 sections of five different online courses. In these courses, students took tests, found information, and participated in chat rooms, discussions, or emails with instructors. A university teaching evaluation scale was used in this study to measure students' perceptions of teaching effectiveness. A second instrument called Survey of Student Experiences in Online Courses measured technological problems students experienced in the online course and the detrimental effect these problems might have had on students' learning. A new variable was created and called *impact score*. This was the product of the frequency and detrimental effect for each activity. Results showed a positive relationship (r of .26, $p = .003$) which indicated that the more frequently students experienced technology problems or the more severely their problems impeded learning, the higher they evaluated the instructor and the course.

Keywords: Technology problems; Online courses; Teacher evaluations

* Corresponding author. Tel.: +1 806 742 1997, 225; fax: +1 806 742 2179.
E-mail addresses: mary.runnels@ttu.edu (M.K. Tallent-Runnels), William.lan@ttu.edu (W.Y. Lan), wes.fryer@ttu.edu (W. Fryer), Julie.thomas@ttu.edu (J.A. Thomas), sandi.cooper@ttu.edu (S. Cooper), kun.wang@ttu.edu (K. Wang).

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1. Introduction

With the rapid development of technology, online instruction has emerged as an alternative mode of teaching and learning, or at least a substantial supplement to traditional teaching. In the academic year 2000–2001, 90% of public 2-year and 89% of public 4-year institutions offered distance education courses. In that same year, there were an estimated 2,876,000 enrollments in college-level, credit-granting distance education courses. Of those institutions offering distance education, 43% offered Internet courses using synchronous computer-based instruction, which the authors of this paper call online courses (Waits & Lewis, 2004). Synchronous online classes are offered in such a way that all students are online and communicating at the same time as opposed to asynchronous online classes which are those classes in which students can log on and work on the course even if no one else is logged on at the same time.

Some faculty may be unwilling to teach in an online format. In particular, institutional obstacles may deter potential online instructors. Institutions that want to implement and/or increase online instruction need to provide continuous technical support for faculty members when they are developing and delivering online courses (Gibson & Herrera, 1999; Phipps & Merisotis, 2000). Jones and Gower (1997) found that online instruction is less likely to occur in universities where faculty members' efforts to develop and teach online courses go unrecognized by university administrators and where institutional policies do not explicitly tie those efforts to faculty members' tenure, promotion, and merit raise decisions. Faculty members also need assistance from their institutions for managing online courses' technical issues (Vallejo, 2001). Based on a survey of more than 1000 faculty members, Betts (1998) concluded that among the reasons that faculty members were not involved in distance education were technological issues.

Another factor that affects faculty members' willingness to teach online is the concern that students' evaluations of their teaching would be lowered because of technology problems students might experience in the online environment. No matter how advanced the technology used in online instruction, it seems inevitable that students will encounter technology difficulties. Wilson and Whitelock (1998) found students' learning and satisfaction in an online course were determined by the immediate accessibility of the information, assistance, and feedback. Whenever this accessibility is interrupted or denied due to technical problems, learners will be frustrated, because their learning process is impeded or interrupted. Vonderwell's (2003) study also showed that immediacy of communication between instructors and students and between students is a critical success factor for effective online learning. Delay or interruption of the communication can cause student frustration and decrease their motivation. Logan, Augustyniak, and Alison (2002) investigated college students' experiences in an online course of electronic information sources and found technical difficulties were frequent barriers to student learning. The authors classified online communications into four categories of content, logistical, technical, and evaluative comments. About 22% of the students' questions were requests for solutions to technical problems. Additionally, students might devote a great amount of teaching/study time while learning new skills that they must possess to be successful in the online learning environment (Davidson-Shivers, Tanner, & Muilenburg, 2000; Richards & Ridley, 1997; Warschauer, 1998; Wells, 2000). The time spent climbing the learning curve of computer-related skills is necessary but may not be directly related to learning of course content. Under these circumstances, faculty members who are teaching online courses could be

blamed for problems that may be out of their control. When students are frustrated by technological difficulties, teaching evaluations conducted under such circumstances might not be valid, because the evaluation that is intended to assess teaching effectiveness is now "polluted" by the technology difficulties.

In a prior study, Lan, Tallent-Runnels, Fryer, Thomas, Cooper, and Wang (2003) found a negative correlation between teaching evaluations and technology problems in an undergraduate statistics course in Business Administration. In this course, divided into four sections, students could take quizzes and view power point slides also used in the face-to-face sections. No chat room or discussion site was available in these sections. Results also showed that students in the face-to-face classes rated the course higher than did those who took the course online. In addition, there was an inverse correlation between the technology problems students had and their evaluation of their instructor. Based on these results it was recommended that a formula to adjust the teaching evaluations for the technology problems that are out of the instructors' control be used. In this study, this same relationship was examined, but this time it was dealt with graduate students instead of undergraduate students. The intent is to learn whether this inverse relationship exists among both of these groups.

2. Methods

Participants included 131 graduate students in a College of Education. They were from 19 sections of five different online courses. These courses included educational psychology, educational leadership, educational technology, special education, and elementary education. In these courses, students took tests, found information, and participated in chat rooms, discussions, or emails with instructors.

2.1. Instrumentation

A university teaching evaluation scale was used to measure students' perceptions of teaching effectiveness. The instrument was developed by a task force composed of faculty members from colleges across the university campus. After carefully scrutinizing the reliability and validity of the instrument, the university made it a mandatory instrument for evaluating faculty members' teaching. The instrument contains 16 items in two parts. Part 1 of the instrument consists of 10 items regarding the personal effectiveness of the instructor. Part 2 of the instrument consists of 6 items regarding the course effectiveness. For this study, a mean of the 16 items in the instrument, ranging from 1 to 5, was used as the teaching evaluation score. Cronbach's reliability coefficients for Part 1, Part 2, and the total instrument in the current study were .94, .90, and .96, respectively.

A second instrument was developed and called Survey of Student Experiences in Online Courses to measure technological problems students experienced in the online course and the detrimental effect these problems might have had on students' learning. Eight activities students might engage in when taking an online course were listed in the center of the sheet. These were e-mailing, accessing websites, chatting online, asynchronous discussion, taking tests online, submitting homework/assignments online, accessing other course resources, and getting technology

support when having problems. On the left side of the activity list was a scale measuring frequencies with which students encountered technology problems when engaging in course activities. Students were instructed to describe how often they experienced problems on a 5-point scale with values as "N/A," "never," "sometimes," "often," and "always." On the right side of the activity list was a scale measuring the detrimental effect of the technology problems on students' learning. For each activity, students were instructed to assess how much technology problems they experienced in the online environment hindered their learning on a 5-point scale with values of "N/A," "not at all," "very little," "sometimes," and "very much." Inasmuch as the response of "N/A" indicated a student was not engaged in an activity or did not use a skill in learning, the response "N/A" was treated as a legitimate missing value. The values of 1–4 were then reassigned to the responses of "never," "sometimes," "often," and "always" on the frequency scale and "not at all," "very little," "sometime," and "very much" on the detrimental effect scale. Therefore, a value of one on the scales indicated either the student never experienced a problem when engaged in a given activity or that the problem did not impede the student's learning, and a value of four indicated the students always had technology problems when engaging in the activity or the problems severely hindered the student's learning. Cronbach's reliability coefficients were .94 and .90 for the frequency scale and the detrimental effect scale, respectively. See Appendix A for a copy of this instrument.

Believing students' perceptions of the instructor and the course would be influenced by both the frequency and the detrimental effect of the technology problems they experienced, a new variable was created and called *impact score*. This was the product of the frequency and detrimental effect for each activity. The range of the impact score was between 1 and 16. The mean of the eight impact scores for the eight activities was used as the measure of detrimental impact of technology problems on students' learning. The Cronbach's reliability coefficient of the impact score was .90.

2.2. Procedures

Procedures included making the instruments available online for all of the online students. Directions were provided, and students were urged to respond; however, all students were assured that participation was voluntary. They were also told that their instructors would not see their names on their evaluations. Results were sent to one of the researchers who did not teach any of the courses evaluated in this study. He removed all names from the instruments after he organized the data.

3. Results and discussion

To examine the existence of the relationship between technology problems students experienced in the online course and their evaluation of teaching, a Pearson's correlation coefficient was calculated between the teaching evaluation score and the detrimental impact score. Unlike the results of the study with undergraduate students, a positive relationship was found with the Pearson's r of .26, $p = .003$ which indicated that the more frequently students experienced technology problems or the more severely their problems impeded learning, the higher they evaluated the instructor and the course. These

preliminary results suggest that faculty who teach graduate students online cannot blame lower evaluations on technology problems.

It is possible that the higher self-regulation and motivation of graduate students (McManus, 2000) as well as the more frequent interaction between students and faculty in these graduate courses are the reasons for this positive relationship (Keefe, 2003). It is possible that these graduate students had more online interaction with their instructors than the undergraduate students did. It is also possible that this more frequent interaction made the students feel that they were getting more help with their technology problems than the undergraduate students did in the previous study. For example, Greene and Land (2000) explored instructional scaffolds to support cognitive functioning. They found guiding questions helped students focus and develop their projects. These students needed back and forth discussion with their instructors to help them understand their course projects better and begin thoughtful consideration earlier. Student-to-student interaction, specifically over shared prior experiences, influenced student ideas and encouraged them to expand, formalize, and refine their reasoning.

Further study is needed to determine the nature of this relationship. This study should now be conducted with undergraduate students in online courses where there is more student-to-student interaction as well as more student-to-teacher interaction than in the first study.

Concerns about faculty evaluations must be addressed if we want more faculty members to be willing to teach online courses. Students' technology problems give rise to a particularly serious concern that should be addressed further. Certainly follow-up research must be done to determine more about evaluations and technology problems. Research similar to the previous study of undergraduates, showing lower evaluations for online sections than for face-to-face sections, should also be explored with graduate students. Other future studies might be conducted to determine if online courses generally receive lower evaluations than face-to-face classes and to further understand how online interactions with faculty members might help students resolve technological problems and otherwise improve course evaluations.

Appendix A

TEXAS TECH
COLLEGE OF EDUCATION

ONLINE COURSE TECHNOLOGY SURVEY: Fall 2001

This course evaluation page is for **Wesley Fryer**, enrolled in EPSY 5380 during Fall 2001.
If you are not Wesley Fryer**, please click here to log in.**

Part 1: Evaluation of Course and Instructor

Directions: The questions below are the same ones you answered on the red and white bubble sheet at the end of the semester (these were mailed to you). Because we need to correlate your level of satisfaction and frustration with technology related to this course with your perceptions of the faculty member, we need you to respond to these questions again on this online form. Please check one box for each question

Instructor Performance:	**Strongly Agree 5**	**Agree 4**	**Neutral 3**	**Disagree 2**	**Strongly Disagree 1**
1. Overall this instructor was effective	○	○	○	○	○
2. The instructor was available for consultation during office hours or by appointment.	○	○	○	○	○
3. The instructor stimulated student learning.	○	○	○	○	○
4. The instructor treated all students fairly.	○	○	○	○	○
5. The instructor treated all students with respect.	○	○	○	○	○
6. The instructor welcomed and encouraged questions and comments.	○	○	○	○	○
7.The instructor presented the information clearly.	○	○	○	○	○
8.The instructor emphasized the major points and concepts.	○	○	○	○	○
9.The instructor went beyond presenting the information in the text.	○	○	○	○	○
10.The instructor demonstrated knowledge of the subject.	○	○	○	○	○
Course Evaluation:	**Strongly Agree 5**	**Agree 4**	**Neutral 3**	**Disagree 2**	**Strongly Disagree 1**
11. Overall this course was a valuable learning experience.	○	○	○	○	○
12. The assignments were relevant and useful.	○	○	○	○	○
13. Course materials were relevant and useful.	○	○	○	○	○

14. Expectations were clearly stated either verbally or in the syllabus.					
15. The testing and evaluation procedures were fair.					
16. The workload was appropriate for the hours of credit.					

Part 2: Technology Evaluation

Directions: We would like to determine whether you had problems with technology during your online course last semester and whether you think this hindered your learning. Please complete the scales on both sides of each item. Leave an item marked N/A if the component was not used in your course.

I experienced problems with this component:					**Component of Course**	**Problems I encountered hindered my learning:**				
Always 1	Frequently 2	Sometimes 3	Never 4	N/A 5		Very much 1	Somewhat 2	Very little 3	Not at all 4	N/A 5
					Emailing instructor or other students					
					Accessing Websites					
					Using Chat Rooms (synchronous time)					
					Discussing (asynchronous time)					
					Taking Tests or Quizzes					
					Submitting Homework/assignments					
					Accessing other course resources					
					Getting technology support when you had problems					

Student Information:

A. I am taking this course because (check all that apply):

- It is required for my major or minor.
- It is a core curriculum requirement.
- It will be good for my career.
- The instructor has a positive reputation

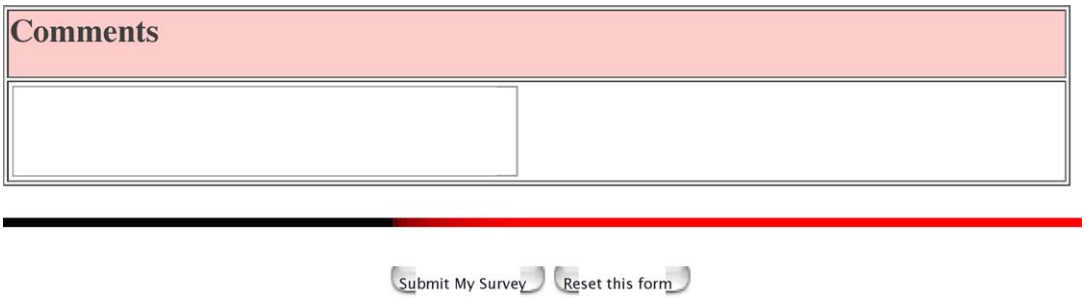
Other:

B. The grade I expected to receive in this course:

- A
- B
- C
- D
- F
- Pass

C. The approximate number of hours I spent each week studying for this class:

- None
- 1 - 3 hours
- 4 - 6 hours
- 7 - 10 hours
- More than 10 hours



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