Frequency and Types of Instructor-Interactions in Online Instruction

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Abstract

Concerns for faculty time spent in online instruction are replete in the literature; some authors suggest that online instruction increases faculty work. In a specific rather than global manner, this case study focused on the frequency and types of instructor-to-student interactions that occurred in a graduate online course. Using archival records, interactions were classified by communication tool, message content, and recipient, and then tallied. Most instructor-student interactions occurred through the LMS gradebook, followed by emails. Most communications were related to course assignments and sent to individual students. The overall total of interactions was comparable to other findings and may suggest that online teaching, at least in this case, increased faculty work. This may be due, in part, to the individualized nature of the instructor-student interactions. Further study is recommended.

Introduction

Online teaching and learning can be very personalized when the activities between instructor and learner are interactive. Even though independent, self-study type courses are the majority of online offerings (Clark & Mayer, 2003), interactivity is often considered a key feature of online learning and an assumed necessity (Brown, 2004; Oblinger, Barone, & Hawkins, 2001; Ryan, Carlton, & Ali, 2004). Appana (2008) suggests that while interactivity is considered one of the major benefits of online instruction for students, perhaps it is a detriment to instructors.

The different types of interactions found in online instruction (Davidson-Shivers & Rasmussen, 2006; Moore, 1989; Wagner, 2001) include the following: (a) *student-student interaction* which occurs when students work or communicate with each other in small or large groups or on an individual basis; (b) *student-instruction interaction* which means students are working with the instructional materials or activities, (c) *student-learning management system (LMS) interaction* which allows students to navigate through the online instruction, complete and submit assignments, and track their progress and grades; and (d) *instructor-student interaction* which occurs when the instructor and students work and communicate with each other.

This fourth type, instructor-student interaction, is significant to this study. These interactions are considered fundamental to online instruction. Interactivity occurs through the usage of asynchronous or synchronous communication tools (Lavooy & Newlin, 2008). Instructor-student interactions may occur on a one-to-one, small group, or whole-class basis. Additionally, an online instructor may become the facilitator rather than the provider of knowledge (Appana, 2008; Davidson-Shivers & Rasmussen, 2006; Gresh & Mrozowski, 2000; Thurmond & Wambach, 2004). This change affects how the course is conducted as well as the amount of time and effort spent teaching online.

Thurmond and Wambach (2004) suggest that interactions between students and faculty help students clarify and obtain a correct understanding of the course content. Interactions also allow students and faculty to get to know each other as individuals (White & Weight, 2000). Generally speaking, interaction can occur through the use of a variety of communication tools, such as chats, threaded discussions, emails, gradebook comments, announcements, etc. and may be used to provide directions, guidelines, and feedback on assignments and to address student questions or concerns, among other things. However, Mandernach, Dailey-Hebert, and Donnelli-Sallee (2007) maintain that threaded discussions are most often used because they are considered educationally sound forms of interaction. Yet others suggest that threaded discussions are not the only tool to use and may limit the way in which students interact with each other and the instructor for a balanced amount of instructor intervention (Bonk, 2004; Davidson-Shivers & Rasmussen, 2006). Additionally, the more tools used may not only increase the interactions between instructor and student but also increase the time and effort spent teaching online.

Although Gresh and Mrozowski (2000) suggest that successful online teaching is relative to quality instructor-student interaction and such quality need not be a time burden, others would disagree (Appana, 2008; Blair & Monske, 2003; Brown, 2004; Cavanaugh, 2005; Oblinger et al., 2001; Pattillo, 2005; Ryan et al., 2004). Some have found workloads more than double when teaching online compared to traditional classroom (Pattillo, 2005; Romiszowski & Chang, 2001). Cavanaugh (2005) also reported spending double the amount of time in his online class as compared to his on-campus class. Overall, he found he had averaged 6.77 hours per online student compared to the .71 hours spent per on-campus student due to the heavy amount of individualized attention spent with each online participant. Additionally, he stated the time demand was also linked to the number of students enrolled in any given section. Likewise, Santilli and Beck (2005) found some faculty spend from 80 to 160 hours teaching online and again, the variation in time spent was due to the number of students enrolled, course content, and purposes. They stated that faculty reported their time demands being greater in online than in face-to-face courses.

Mathews, Maher, and Sommers (2001) documented that one faculty member spent 37 hours planning and developing materials for it, 101.5 hours preparing for its delivery, and another 14 hours in the actual course implementation. Likewise, Lazarus (2003) reported his spending from 3½ to 7 additional hours per week per online course with more time occurring during the first and last two weeks of the course and most time being spent on emails. Hislop (2001) excluded development to focus only on time spent teaching online; his findings also support the idea that teaching online takes more time. He found time demands were more complicated than initially posited with several factors adding to workload. Of these factors, two which may add to faculty workloads are participants' lack of experience and the level of interaction among participant.

Lack of Experience Adds to the Time Demand

Davidson-Shivers and Rasmussen (2006) stated that instructors' lack of expertise with Web-based technology and pedagogy may add to their teaching time and effort. It may be difficult for them, especially novices, to troubleshoot technical difficulties. Likewise, faculty members do not always realize instructor-student interactions involve new skills in terms of time management and engaging students in communication (Easton, 2003). Instructors may not know what is appropriate in terms of when and how often to communicate with students. Moreover, they may feel compelled to spend a large amount of time interacting with students (Kimball, cited in Gresh & Mrozowski, 2000).

Students' lack of experience and technical expertise also adds to instructor work. Tomei (2004) maintained their lack of technical expertise adds to instructor-student communications. Appana (2008) also expressed concern that students need to use technology effectively and be ready to learn through online delivery. Often, the instructor must take extra time to help students work through technical issues or locate appropriate assistance for them. Additionally, the 24/7 phenomenon of being able to post messages all hours of the day may lead to students' beliefs that someone will instantly message them back (Davidson-Shivers & Rasmussen, 2006; Mandernach et al., 2007). Students, especially those new to online learning, tend to email instructors often and have unrealistic expectations about when instructors are available to answer questions (Fox, 2007). An instructor must spend additional time and effort dealing with student concerns as well as helping each to understand how his or her course is set up and functions.

Level of Instructor-Student Interactions

An increase in time and effort may also be due to the high levels of instructor-student interactions. Faculty may not be aware online instruction requires an increase in reading of student work and in providing written feedback to the student (Appana, 2008). The amount of time spent communicating, or interacting, with students is significantly more than in traditional classroom settings (Cavanaugh, 2005; Jin, 2005; Tomei, 2004). For example, Cavanaugh (2005) estimated he averaged between 300 and 600 emails per online course depending, in part, on the number of students enrolled. Jin (2005) also quantified instructor-student interactions over a semester course ($n = 18$ pre-service teachers enrolled) with totals of 374 emails received and 434 sent by the instructor.

One way to calculate time spent on email communications is to use Tomei's detailed accounting of his interactions with students. Tomei (2004) timed his communication with students and found it took an average of 14 minutes to read each student's posting, 9 minutes to review and advise a student of his or her progress, and another 4 minutes to formulate an email response back to the student. By using Tomei's estimate of 4 minutes to formulate a response, it could be speculated that Cavanaugh (2005) spent between 20 and 40 hours preparing his replies to the 300 to 600 emails and almost 29 hours for Jin (2005) to reply back to the 434 emails he received.

Jin (2005) also reported student postings linked to threaded discussions involved 700 messages, and chats accounted for two hours of the online instruction. Examining threaded discussions in several undergraduate courses, Mandernach et al. (2007) found an average of 5.46 times a faculty member posted to a threaded discussion and averaged about three hours per week in discussion activities. They also realized the amount of interaction and time spent by instructors varied greatly and suggested that this variability may be due to variation in instructional goals, student abilities, and pedagogical beliefs of individual faculty members and

did not reflect on an instructor's overall investment in a course. They expressed a need for other faculty "to share information and best practices from the field" (p. 7) and for further research be conducted in this area.

To broaden the research on instructor interaction, this case study did not focus on a single communication tool, but all types of communication tools used in online instruction. In addition, the instructor-to-student interactions were classified by the contents of the messages sent by the instructor and whether the recipient was an individual student, a small group of students, or the whole class. In other words, this study examined the frequency and types of instructor-student interactions in a very specific rather than general manner.

Methodology

Participants

Students. Participants were enrolled in this required course on psychology of learning in the College of Education (COE) at a university in the southeastern part of the United States. There were 11 graduate students: eight women and three men. For a few of them, this was their first online course.

Course instructor. In this case, the researcher was also course instructor and course developer. This researcher had roughly ten years experience teaching the course as well as teaching it online. Having offered the course multiple times, materials for each unit were already prepared and could be duplicated within the eCollege LMS from one term to the next. The main development tasks were updating the content and materials (i.e., syllabus, readings, text-based lectures, assignments, etc.) and verifying that web links were current and active. For-the-most-part, revisions were made to units a week or two before each unit began. Hence, course development time was somewhat minimal and not a consideration in this study.

Course Description

The course focused on the theoretical and empirical foundations of learning psychology as it pertained to education and training. The emphasis was on the practical application of learning principles into classroom situations. These principles can be applied to any content area, any population—children, youth, or adults,—and with any delivery system. The main instructional goals were as follows:

- Identify, explain, and apply various psychological concepts and principles of learning to teaching/training situations.
- Compare and contrast various learning theories across the three main paradigms.
- Discuss the influences of diversity of student populations on the instructional and learning process.

Students were to complete 15 units in an online environment over an eight-week summer term. Students completed two units per week during the first six weeks and completed only one unit per week during the last three weeks. Because of timing, the last class day of the term was also the first and last day of unit 15. On that day, students were only required to submit their final papers. If they so chose, they could also share final comments with each other in a threaded discussion.

Course requirements. The major course requirements included (a) participation and professionalism (15% of final grade), (b) annotations and reflection papers (25% of final grade), and (c) term paper (60% of final grade). Each requirement received instructor comments and a

numerical score, which culminated into a final total score. The final score was then translated into a letter grade at the end of the term.

The course required that students participate in one or two threaded discussions per unit. As part of the participation and professionalism score, students also completed short unit assignments, such as finding relevant websites or journal articles. In addition to sharing their ideas about certain concepts presented, the aim of the short assignments was to help students become acquainted with other students, understand course procedures, and become familiar with the LMS, the university's library, and the APA style guide. Explanations of the various short assignments are shown in Figure 1.

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Short Assignments

1. **Email instructor.** Emails were sent to the instructor to verify an activity had been completed by the student. They are as follows:
   - After searching the Online Library for a scholarly reference, send a copy of its abstract via email. Also, send your response to the question, "what does scholarly reference mean?" (Unit 1)
   - At the end of the first week, send your general idea to write about for you final paper. (Unit 1)
   - Send a copy of the results of your learning style assessment to your instructor. (Unit 4)
   - Send a copy of the results of your TPI to your instructor via email. (Unit 13)

2. **Drop Box Entries.** There were three other short assignments submitted to the Drop Boxes. These assignments were not shared with other students because they related to personal views or reflections. They were scored using a satisfactory scale, if completed. Submissions were sent back to the students through their in-baskets.* For example, in Unit 1, students were to do as follows:

   BEFORE READING THE CHAPTER 1, answer the following questions in your own words based on what you think prior to starting this course. I will not be grading your thoughts per se—I just want to know what you think at this point in time. At the end of the course, we will see if your ideas have changed.
   What is learning? How is learning different from thinking? Why is studying and learning psychology important to you in your professional or personal life? How do you anticipate using this information in your current or future job?

   In Unit 14, these questions were asked again, and students also compared these responses with those they submitted in Unit 1. Again, comments were made and S+ to U scores assigned.

   *NOTE: Due to a glitch in the Drop Box, these short assignments did NOT link to the Grade Book and only showed in the instructor's and each individual's in/out basket. To avoid confusion, these are only noted as Drop Box counts and NOT included in the Grade Book tallies.

3. **Document sharing Unit assignments.** As the name implies, these short written assignments were to be shared with others. However, the tasks did not lend themselves well to discussion. Examples of document sharing tasks included (a) students providing one or two examples of concepts presented in the unit, (b) explaining in their own words what a principle meant or how related it to their professional experiences, or (c) identifying a journal article on a given topic. There were eight document sharing assignments including the Online Bio.

4. **Webliography.** Students were to locate a website on a given topic, provide its URL, and summarize what was found at the site. It was hyperlinked it to the website by the LMS. There were six assignments to locating websites.

   Generally speaking, if a website activity was assigned, document sharing activities were not (except in the case of two units).

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Figure 1. Specific guidelines and descriptions of short unit assignments for the class.

These short assignments were reviewed but not assigned a score or given individual feedback. After the unit had ended, culminating feedback on the unit activities and assignments was provided, noting that information was received and/or correct (if incorrect, correct answers were supplied). However, this feedback was sent in combination with other unit assignments, such as participation in threaded discussions, and then it was sent through email or the drop box

system. The emails were sent to the whole group acknowledging participation and completion of assignments, in general. If participation lagged by an individual over a period of time, an email was sent to the student asking if there was a problem. When using the drop box system, feedback was much more individualized and sent to each individual.

Additionally, general comments were mentioned in the instructor's unit summaries pertaining to what students produced or found in the short assignments. Students also received information about their participation throughout the term. Only a numerical score, without comments, for participation and professionalism was posted to the grade book at the end of the term.

A second course requirement included three **annotations** for an annotated bibliography and two reflection papers (25% of final grade). For the annotations, students were encouraged to locate scholarly references related to their term paper. The annotations were due midterm to provide students with an indication of how well they were doing in the class and as a means to encourage early starts on their papers. For the **reflection papers**, students were to think about the content and activities for a given unit and submit their written reflections one week after the unit had ended. Students were instructed to format the papers in two-page, double-spaced word documents. Deadline for the last reflection paper was due during the sixth week of summer term. A drop box was linked to the in/out baskets of instructor and individual students and was also linked to the gradebook; scores and instructor comments could be viewed in both places (that is, drop box and gradebook). However, the actual counts for annotations and reflection papers are only noted as gradebook frequencies to avoid duplication and confusion.

The final course requirement was a **term paper** due on the last day of the summer term. Students were instructed to write a review of literature style paper using APA formatting. They were to upload their paper as an attachment to the drop box. Scores for their paper were posted to the gradebook with instructor comments written on the actual document. These papers were returned in a sealed envelope to students, and they could either pick them up at the department office or receive them through the U.S. Postal Service. Again, to avoid duplication and confusion, counts were only included in the gradebook.

Once all of the numerical scores were posted to the gradebook, the LMS automatically tallied the scores with total points scored and percentages. The instructor's policy was to round-up percentages to the next percent. The letter grades were posted in the gradebook. These were also submitted through a different university system, known as Personal Access Web System (or PAWS) for placement in student records. In case of concerns about final grade, students were advised to contact and meet with the instructor during the first two weeks of the following semester.

Facilitating the course. The main instructor's role was facilitating student participation and learning. Instructor interactions with individuals were about their participation, assignments, or questions and concerns. If there were general questions or concerns, a mass announcement or email was sent out. Although email system was generally checked on a daily basis, students were notified of designated times (online office hours) the instructor would check and respond to emails as well as the instructor's on-campus office hours.

Because threaded discussions were designed as student forums, this instructor observed, but did not actively participate, in the threaded discussions. This instructional strategy was based on instructional design principles and pedagogical beliefs of the instructor. Online instruction requires a balance of instructor involvement in discussion: not too much or too little (Bonk, 2004; Davidson-Shivers & Rasmussen, 2006).

Once units were completed, summaries of unit content and student activities were sent to students. The summaries (about 10-12 pages in length) included instructor observations about the threaded discussions, general comments about students' work (i.e., examples they shared or websites found), inaccuracies about the content corrected, or additional information on various topics was provided. These summaries also served as a way to close the unit. To reduce development time, summaries were revised based on updated content and the current students' postings.

Other instructor tasks were to download completed assignments and then upload scores and written comments, or feedback, to students. Additionally, announcements, such as changes to the course schedule or notices about university activities, were posted.

Data Collection and Analysis Procedures

Using archival data from the LMS and the university's email system, data were not retrieved until after the term had ended and final grades submitted. Any identifiers were removed before data were aggregated and reported. Although data from the activity login time through the LMS was available, it was not examined. Such time logs are only estimations, which could not be validated due to (a) the lack of differentiation between active and idle time and (b) the lack of documentation concerning the amounts of time when some instructor communications were composed offline.

Categories of Instructor-Student Interactions
The scheme accounts for content of the information, communication tools, and recipients with descriptions. Only minor modifications were made during data analysis; the final scheme is shown in Table 1.

Table 1.

Categories and Descriptors for Instructor-to-Student Interactions

General categories	General descriptors	Examples
Type of information shared		
Content or topic	Information related to actual content of the course or unit. Introduction to units and reminders. Providing unit summaries and other course materials. Information on when, how, and where they would receive feedback and so on.	Hi everyone: Attached is my summary of Unit 1 and 2 (Week One)…Be sure to finish up Week Two today and Units 5 and 6 will open tomorrow. If you want to get a jump on the readings, they are listed in the course schedule found in the Course Home [page]. Take care, [instructor name] Hi: I've reviewed your Unit 8 drop box assignment and returned my comments back to you. Remember all Reflection Papers are due on Tuesday. **Location of Additional Readings** The additional readings may be found at the USA online library. (1) Go to the USA home page. (2) Select libraries

		on the menu. (3) Under University libraries, select university library. (4) You should see the Southcat Plus page. (5) Select course reserve. (6) Choose course by course title and select my last name. The readings can then be downloaded. NOTE: You may have to login in order to download the items— just follow the USA library's directions.
Course Assignment	Comments about participation and completion of assignments, scores and feedback on completed assignments, and encouragement for further participation in threaded discussions. Further explanations or directions about course requirements, such as final papers, finding websites, etc., and address specific questions or concerns about assignments and deadlines.	…I'd like to see you on average at least three times in each thread [discussion]…I say average because some of you reply to others several more times in one threaded discussion, such as 5 or 6 in TD1 (GREAT) and then 2 or 3 [postings] inTD2—which still results in an average of 6+ interchanges.<hr>Hi [student name]: Thanks for sharing your thoughts. We will review these questions again toward the end of the term to see whether your ideas have changed any, based on what you've learned in this course. –[instructor name]<hr>Hi [student name]: Good job on Reflection Paper 2. I would like to have seen more reflection on the threaded discussions. Glad to hear you doing independent searches on topics; that's the sign of a good grad student! (NOTE: A score was also included with this comment.)<hr>Hi [student name]: JEP is peer reviewed and reference citation is OK (note in reference list, it needs to be double-spaced). See following ways to cut down superfluous information for a summary…Again, difficult to distinguish whether this was informative or useful for you, whether it was new information, etc. from your critique. (NOTE: A score and an attachment were included with this comment.)<hr>Hi: Your 3 annotations are past due. Read the assignment in the course syllabus and turn them in using the Drop Box ASAP. Thanks, [instructor name]<hr>Hi [student name]: While the book sounds very interesting, I don't think that it could be classified as a scholarly reference. Please resubmit another annotation on a different textbook, book chapter, or journal article. I will give you some additional time (a few days) to resubmit. OK?
Technical Issues	Problems related to technology or the website environment. Directions on how to access course readings, to use USA online library, to use APA, and so on. Responses sent to individuals with computer problems or other technical issue. However, for major technical problems, students were referred to the LMS	Thanks for letting me know that the lecture notes were not viewable. I fixed this and they are now!<hr>For Unit 12 reading, find the article entitled "Determinants of student efforts…" It is the one by Brookhart.<hr>I've added the 2 categories: human development and motivation to the Webliography. For those of you who submitted websites already, I was able to change the category by editing each.

	Help Desk.	Hi [student name]: Glad the technical errors with your computer have been resolved. Try to catch up by the end of this week.
General Information	General information about the course, schedule adjustments, university notices, etc.	Hello: I have opened up the remaining units. And, yes, I've extended the deadline when your final paper is due…on the last class day of the term. After 5pm, I will start reading and scoring your paper and then grade the papers. **Registration for next term will begin soon** Just to let you know that pre-registration begins soon. Advising starts this week; please try to contact your advisor regarding your course schedules during these next few weeks. Waiting until the end of the semester (or summer term) will be too late because your advisor is also wrapping up his or her semester as well as planning courses for the next one! I'm sure that you'll be (or have been) notified about the course schedule and registration steps.
Other	Not related to course content or activities, but more to socializing about student and faculty work and daily life outside of graduate school. Some simply acknowledged student dealings with family or personal situations, their never having worked so hard on a course in all of their lives, or their enjoyment in taking or having learned from the course. Messages were in a less formal, more conversational tone.	For those of you interested, here is a copy of my book cover. The publisher had an artist design the cover—I think it's rather cool. It's a jpg (image) file. Have a great July 4th! It's been a crazy week (and weekend). My home renovations are still not finished …and [my other] faculty work is increasing…I hope your summer is less crazy than mine. Take care, [instructor name] I am glad you are feeling better. -[instructor name]
Type of communication tool used		
Online announcement		Billboard on course home page
Emails		Initiated by the instructor or instructor responding to student-initiated email
Threaded discussion		Asynchronous discussion or debate
Chats		Synchronous discussion
Document sharing and web library attachments		Place to upload/download documents or Web links.
Drop box with in/out baskets		Depository for students to send completed work to instructor's in-basket. Instructor would review and send comments back to each individual's in-basket and a copy would be retained in the instructor's out-basket.
Gradebook		Grades or scores entered in to individual student grade book file. Comments and feedback on student work could be added.

Off-line communication or on-campus meetings	Phone calls, on-campus office hours or meetings, informal discussions.
Type of recipient	
Individual student	Message sent to each student on an individual basis
Small group	Message sent to a few students (two or three) but not the entire class
Whole class	Message sent to entire group of students enrolled in the course

Using the categories shown in Table 1, the interaction data were first sorted by the communication tool used. Next, communications were categorized and tallied by type of message content or information shared and then followed by type of recipient. Data retrieved from within the LMS (i.e., grade book, document sharing, drop box) were analyzed by the researcher in order to maintain student confidentiality about assignment scores and final grades. However, a graduate assistant helped with data retrieval from the university's email system and verified email counts.

Results and Discussion

The overall total number of instructor-student interactions was 244, for an average about 22.18 per student recipient. This total is comparable to those cited by Cavanaugh (2005), who averaged between 300 and 600 emails per online course, and by Jin (2005), who tallied 434 instructor interactions. Recall that both studies occurred over an academic semester, whereas this current study was during an eight-week summer term. Additionally, the previous studies were conducted using larger pools of participants compared to this study's student enrollment. When comparing the email per student recipient averages, Cavanaugh's would average approximately between a low of 7.89 to a high of 15.79 per student (Note: Cavanaugh only counted emails to individuals. If mass emails were included, this average would most likely increase.). The average emails per student for Jin's study would be about 28.9, and again, although somewhat less, these are comparable averages to the current study's findings.

Table 2 shows the types of communication tools used during the course offering. The majority of them occurred through the grade book ($n = 88$), followed by emails ($n = 77$) and Drop Box ($n = 39$). Less seldom used were the online announcements that appear as the home or unit page opened. Not surprising, only two interactions occurred through threaded discussions.

Table 2.

Use of Communications Tools

Communication tools	Totals
Online announcement	17
Emails (instructor-initiated or as a response to student-initiated combined)	77
Threaded discussions	2
Chats*	0
Drop box with in/out basket **	39
Document sharing, web links, or attachments	11
Grade book ***	88
Off-line communication or on-campus meetings	10
Grand total	**244**

*Chats were not used in this course offering.
**Only the three short unit assignments were included in the Drop Box total. Six additional counts were due to a second posting by the instructor to individual students.
***Even though linked to the Drop Boxes, there is no duplication of counts. Only the major course requirement counts were included in the Grade Book total.

Further analysis of data identified the information shared within the communication and type of recipient. Table 3 shows most interactions were related to course assignments ($n = 135$), followed by general information ($n = 42$), other ($n = 29$), and course content or topic (n = 28). Course assignments were fairly evenly divided by feedback on assignments and participation levels in discussion, and scores on graded assignments were sent using the tools of drop box, grade book; sometimes emails included feedback.

Table 3.

Type of Information Shared with Students by the Instructor

Type of information shared	Total
Content or topic	28
Course assignment	135
Technical issues	10
General information	42
Other	29
GRAND TOTAL	244

The vast majority of messages were sent to individual students ($n =167$), followed by whole class ($n =71$), and with only a few messages sent to small groups ($n = 6$) as shown in

Table 4. For the whole class, the content-related messages were providing information on when, how, and where they would receive feedback, would be provided course materials, and would be encouraged in their continued participation in threaded discussions. Additionally, responses to individual students related to their specific questions about final papers, concerns about their progress, or requests for some other type of instructor assistance. Only a very few individuals received emails related to noticeable lack of inactivity in the course overall.

Table 4.

Type of Recipient

Type of recipient	Total
Individual student	167
Small group	6
Whole class	71
GRAND TOTAL	244

Table 5 provides a comprehensive view of the types of information shared by the type of communication tool used and to which type of recipient. The majority ($n = 135$) of interactions were from the instructor to individual students about course assignments through grade book, drop box, and emails. Whole group interaction was mainly through announcements and emails and related to content/topic, course assignments, or general assignments; these were sent mainly through emails and announcements. Only minimal interactions were made with small groups. These groups were not always the same two or three students. They were grouped based on the type of information that needed to be shared and did not disclose confidential information.

Table 5.

Subdivision of Contents of Information by General Categories by Recipients

	CONTENT OR TOPIC	COURSE ASSIGNMENT	TECHNICAL PROBLEMS	GENERAL INFORMATION	OTHER	TOTAL
ONLINE ANNOUNCEMENT:						
Whole Class	1	5	1	10	0	17
EMAILS INITIATED BY INSTRUCTOR:						
Individual Student	0	3	1	5	1	10
Small Group	*0*	*2*	*0*	*1*	*1*	*4*
Whole Class	11	11	0	10	10	42
EMAILS RESPONDING TO STUDENT-INITIATED EMAILS						
Individual Student	3	6	0	4	7	20
Whole Class	0	0	0	1	0	1
THREADED DISCUSSIONS						
Small Group	*2*	*0*	*0*	*0*	*0*	*2*
DROP BOX/IN & OUT BASKET						
Individual Student	2	33	4	0		39
DOCUMENT SHARING/ WEB LINKS/ ATTACHMENTS						
Whole Class	7	4	0	0	0	11
GRADE BOOK						
Individual Student		88	0	0	0	88
OTHER/OFF-LINE COMMUNICATION (PHONE, MAIL, OFFICE VISITS)						
Individual Student	2	6	1	1	0	10
Total	28	135	10	42	29	244

NOTE: If no instructor-student interactions were found for a category, the category is not shown in the table.

As previously discussed, interacting with students on some level is central to online courses and to the instructor's role (Appana, 2008; Davidson-Shivers & Rasmussen, 2006; Palloff & Pratt, 1999). However, without "tangible postings" to threaded discussions (Mandernach et al., 2007, p. 6), these 244 instructor interactions and involvement may be less perceptible and less obvious to a casual observer.

Based only on a rough gauge of dates noted during data analyses, emails to individuals remained fairly consistent throughout the summer term; they lessened to some degree midway through the term and then increased again during the last couple of weeks when the final paper deadline approached. Other communications to the whole class were more frequent at the beginning of the term and lessened as the course progressed. However, there were a few

additional content-related postings explaining how and when grades would be posted toward the end of the course.

Because data were categorized in a specific manner, this study addressed the volume of communications and instructor interactions that occurs in online instruction. The majority of instructor interactions was with students on an individual basis and was about explanation about course assignments followed by course content. The major communication tool used was the grade book followed by emails. Even without involvement in threaded discussion, it appears that amount of communication and involvement is comparable to findings of previous studies (Cavanaugh, 2005; Jin, 2005; Tomei, 2004).

Summary

Because online instruction has become a main form of delivering instruction at colleges and universities, interaction is often viewed as necessary and desirable for student satisfaction and learning to occur. Of the differing types of interactions, instructor-student interaction is a critical element to the success of the instruction (Appana, 2008; Thurmond & Wambach, 2004). Communicating, or interacting, with the entire group or with individuals may help students understand course requirements, clarify directions, and assist them in keeping on time and on task. Additionally, instructor interactions may personalize this virtual environment and help students feel less isolated.

Understanding the types of interactions instructors make, and to whom, helps identify the impact of online teaching has on faculty work. For this case, even though instructor involvement may have appeared to be less obvious than if tangible postings to discussions had been observed, there were large amounts of instructor-student interactions. Students were given feedback on quantity and quality of participation each week within the unit summaries. Additionally, whenever a general lack of participation was noticed, a mid-week message was sent to the whole class, and when only a few were not participating, an email inquiry of "Where are you?" was sent to each individual. However, overall, most interactions were between instructor and individual students. This student individualization adds to amount of work involved in teaching online (Appana, 2008: Cavanaugh, 2005). Hence, the results of this case appear to support what has been found in the literature. While this finding illuminates the manner in which online teaching could be streamlined, determining how to reduce faculty workload is less obvious.

Both Appana (2008) and Cavanaugh (2005) state that much of online teaching requires reading and writing about student work and concerns, and it is often individualized. While providing feedback to written assignments is probably no different than it is in an on-campus course, responding to student discussions and questions is very different. In online instruction, student discussions and questions require reading rather than listening and then written, rather than spoken, comments and answers.

Reducing instructor communication to individual students may be difficult to accomplish. One suggestion would be to use more group interactions than individual student interaction, such as making general comments about unit assignments and participation or by including a FAQs section to the website. Another suggestion is to develop objective- rather than subjective-type assignments which can be automatically scored and sent to individual student grade books. Developing a scoring rubric for subjective-type of assignments may also reduce time spent providing written feedback. Finally, an online instructor could designate specific times throughout the term when participation in discussions would be reviewed rather than on a weekly

basis, this would still allow for written feedback to occur, but less often. However, such suggestions should be investigated to see whether they reduce faculty time without adversely impacting student satisfaction and learning.

Other recommendations for research on facilitation and, specifically, instructor-student interaction would be to replicate procedures of this study but with multiple sections and with multiple instructors. This would provide a more complete picture of what may be involved in instructor interactions.

Although other studies have investigated actual or estimated time spent interacting with students or developing and refining course materials, this study did not. It is recommended that actual time spent on preparing unit summaries, reviewing student work, and providing feedback, which are tasks associated with instructor-student interactions, be measured. Again, this would further the understanding of the demands of teaching online.

Finally, this future research needs to address whether and how instructor interactions affect student learning and perceptions. In other words, investigate which type (or types) of instructor-interactions facilitate student performance in and their perceptions of and satisfaction with online instruction.

References

Appana, S. (2008). A review of benefits and limitations of online learning in the context of the student, the instructor, and the tenured faculty. *International Journal on E-Learning, 7*(1), 5-22.

Blair, K. L., & Monske, E. A. (2003). Dui bono? Revisiting the promises and perils of online learning. *Computers and Composition, 28*(4), 443-453.

Bonk, C. J. (2004). Navigating the myths and monsoons of online learning strategies and technologies. In P. Formica & T. Kamali (Eds.), *E-ducation without borders: Building transnational learning communities* (n. p.). Tartu, Estonia: Tartu University Press.

Brown, K. (2004). Technology: Building interactions. *TechTrends, 48*(5), 36-38.

Cavanaugh, J. (2005). Teaching online—a time comparison. *Online Journal of Distance Learning Administration, 8*(1). Retrieved September 12, 2005, from http://www.westga.edu/~distance/ajdla/spring81/cavanaugh81.htm

Clark, R. C., & Mayer, R. E. (2003). *E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning.* San Francisco: Jossey-Bass/Pfeiffer.

Davidson-Shivers, G. V., & Rasmussen, K. L. (2006). *Web-based learning: Design, implementation, & evaluation.* Upper Saddle River, NJ: Merrill Prentice Hall/Pearson Education Company.

Easton, S. S. (2003). Clarifying the instructor's role in online distance learning. *Communication Education, 52*(2), I87-105.

Fox, B. (2007). Teaching through technology: Changing practices in two universities. *International Journal on E-Learning, 6(*2), 187-203.

Gresh. K. S., & Mrozowski, S. (2000). *Faculty/student interaction at a distance: Seeking balance*. Paper presented at EDUCAUSE 2000 in Nashville, TN. October 10-13, 2000. Retrieved from ERIC: ED 452 805.

Hislop, G. W. (2001). *Does teaching online take more time?* Paper presented at the 31st ASEE/IEEE Frontiers in Education Conference, October 10-13, 2001, Reno NV, Session TIF, 23-27.

Jin, S. H. (2005). Analyzing student-student and student-instructor interaction through multiple communication tools in Web-based learning. *International Journal of Instructional Media, 32*(1), 59-67.

Lazarus, B. D. (2003). Teaching courses online: How much time does it take? *JALN, 7*(3), 47-54.

Lavooy, M. J., & Newlin, M. H. (2008). Online chats and cyber-office hours: Everything but the office. *International Journal of E-Learning, 7*(1), 107-116.

Mandernach, B. J., Dailey-Hebert, A., & Donnelli-Sallee, E. (2007). Frequency and time investment of instructors' participation in threaded discussions in the online classroom. *Journal of Interactive Online Learning, 6*(1), 1-9. Retrieved May 18, 2008, from http://www.ncolr.org/jiol/issues/PDF/6.1.1.pdf

Mathews, H. R., Maher, M., & Sommers, B. (2001, July). *Costing online courses—a contemporaneous time log.* Paper presented at Syllabus2001, Santa Clara, CA.

Moore, M. G. (1989). Three types of transaction. In M. G. Moore & C. G. Clark (Eds.), *Readings in principles of distance education* (pp. 100-105). University Park, PA: State University.

Oblinger, D. G., Barone, C. A., & Hawkins, B. L. (2001). *Distributed education and its challenges: An overview.* Retrieved September 30, 2004, from http://www.acenet.edu/bookstore/pdf/distributed-learning/distributed-learning-o1.pdf

Palloff, R. M., & Pratt, K. (1999). *Building learning communities in cyberspace.* San Francisco: Jossey-Bass.

Pattillo, G. (2005). Teaching online: A time comparison. *College and Research Libraries News, 66*(6), 500.

Romiszowski, A. J., & Chang, E. (2001). A practical model for conversational web-based training: A response from the past to the needs of the future. In B. H. Khan (Ed.). *Web-based training.* (pp. 107-128). Englewood Cliffs, NJ: Educational Technology.

Ryan, M., Carlton, K. H., & Ali, N. (2004). Reflections on the role of faculty in distance learning and changing pedagogies. *Nursing Education Perspectives, 25*(2), 73-77.

Santilli, S., & Beck, V. (2005). Graduate faculty perceptions of online teaching. *Quarterly Review of Distance Education, 6*(2), 155-60.

Tomei, L. (2004). The impact of online teaching on faculty load: Computing the ideal class size for online courses. *International Journal of Instructional Technology & Distance Learning.* Retrieved September 9, 2005, from http://www.itdl.org/journal/Jan_04/article02.htm

Thurmond, V., & Wambach, K. (2004, January). Understanding interactions in distance education: A review of literature. *International Journal of Instructional Technology & Distance Learning.* Retrieved September 9, 2005, from http://www.itdl.org/journal/Jan_04/article02.htm

Wagner, E. D. (2001). Emerging technology trends in e-learning. Retrieved February 28, 2002, from http://www.linezine.com/2.1/features/ewette.htm

White, K. W., & Weight, B. H. (2000). *The online teaching guide: A handbook of attitudes, strategies, and techniques for the virtual classroom.* Boston: Allyn & Bacon/Pearson Education.

Feedback from online instructors revealed little agreement among experienced online instructors in the extent to which the quality and frequency of online instructor interaction should be monitored and /or evaluated. The implications of these findings suggest that institutions must establish clear standards for instructor interaction, as well as criteria for evaluation of instructor engagement, in order to guide faculty concerning best practices in online learning. Keywords: Evaluation of Online Teaching, Best Practices in Online Instruction, Faculty Roles, Philosophy of Teaching, Asynchronous A second type of interaction in online environments occurs between learners and their instructors. In any educational setting, the instructor serves as an expert who plans instruction to stimulate students' interests, motivates their participation in the learning process, and facilitates their learning. The relationship between instructor/student interactions and learning outcomes has been well documented in traditional classrooms [70, 71]. Online instruction is used by a variety of organizations, including business and industry, military and government, higher education, and PK-12 schools to provide learners with training and... Frequency and types of instructor interactions in online instruction. Journal of Interactive Online Learning, 8(1), 23–40.Google Scholar. Davidson-Shivers, G. V., & Rand, A. D. (2013).