A Closer Look at Instructor-Student Feedback Online: A Case Study Analysis of the Types and Frequency

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Abstract

It is widely recognized that good teaching includes instructor-student feedback, and in online courses, feedback takes a variety of forms, including both synchronous and asynchronous interactions. To understand better the types and frequency of instructor-student feedback interactions, this case study used document analysis to examine feedback in an online course over a full semester. Feedback interactions were coded as either individual or team feedback and also then coded as either corrective, motivational, or technology-related. With 1,744 recorded instructor-student feedback interactions, corrective feedback accounted for nearly 70% of all feedback (given more often to teams than individuals); motivational feedback was 20% (given more often to individuals than teams); and technology feedback was 10% (given more often to individuals than teams). Additionally, feedback differed over the duration of the semester, with motivational feedback being the greatest at the beginning of the term. An examination of individual versus team differences revealed that teams tended to receive a greater amount of corrective feedback, whereas individuals required greater motivational feedback.

Implications of the study include that instructors may not be conscious of the proportions of corrective versus motivational feedback to their online students. Instructors are also encouraged to take certain measures to reduce the burden of technology feedback required of the instructor, since students will constantly demand such non-pedagogical assistance.

Keywords: Web-based instruction, pedagogy, corrective, motivational, reflective practice, synchronous, asynchronous

Introduction and Theoretical Background

Feedback from the instructor to the student is considered to be one of the key elements of instruction because it is generally assumed to facilitate learning (Kowitz & Smith, 1987). In online courses, instructor-student feedback takes a variety of forms, including both synchronous and asynchronous forms. To better understand the types, timing, and frequency of instructor-student feedback, this case study used document analysis to examine instructor-student feedback in an online course over a full semester.

The notion of feedback as a response to a sender's message originally comes from communication theorists (Shannon & Weaver, 1949; Schramm, 1954), whose early work laid the foundation for the understanding of feedback as an element of instruction. In an instructional setting, feedback has been defined as any communication or procedure given to inform a learner of the accuracy of a response, usually to some type of instructional question (Cohen, 1985; Sales, 1993). Because distance education (DE) differs from the traditional classroom setting, the learning environments have distinct characteristics, such as the physical separation of the instructor and students and the use of technical media for delivering course content and mediating instructor-student interactions (Keegan, 1990). Thus, DE requires the implementation of new forms of two-way communications so that the learner may interact

with the instructor across the location gap (Keegan, 1990). Prior research in DE focused on two main topics: technology factors and instructional factors (Threlkeld & Brzoska, 1994). Both sets of issues play a role in feedback, and neither one can be wholly ignored. In a Web-based environment, the instructor may provide feedback regarding Web-based technology issues as well as instructional feedback throughout the course.

Role of Feedback in Distance Education

The central instructional factor in distance education (DE) is generally the instructor-learner interaction. For example, instructor-learner interaction is essential to student achievement, and instructors in distance education try to "achieve aims held in common with all other educators…[by seeking] to stimulate the student's interest…[and] to motivate the student to learn" (Moore, 1993, pp. 20-21). Due to the often individualized nature of feedback in DE, the instructor can engage in didactic interaction with each learner, giving motivational feedback to one student and content-specific corrective feedback to another (Moore, 1993). Though the instructor and learner are separated physically, the instructor's feedback helps to personalize the learning and to assist the student in learning.

While the literature shows that feedback interactions are certainly possible in a DE environment, the research does not provide a description of the types and frequencies of feedback used in DE. Instead, the research tends to describe the instructor-learner interactions in the broader context of communications in general (Bates, 1994).

Furthermore, when DE studies have described the role of the instructor, they often merely outline the ideal roles the instructor should fulfill. Threlkeld and Brzoska (1994) suggest general guidelines for how the instructor should assist students, such as regularly monitoring written work and keeping students involved in the course. Wolcott (1994) asserts that providing written feedback and using established communication channels will maximize the benefits of feedback in DE. While these recommendations may be valuable for instructors in planning a DE course, they tell nothing about what types of feedback are employed in DE apart from the simple descriptors as "written" or "regular."

Types of Feedback

Corrective Feedback

Mory (1992) highlights that feedback has been historically noted as serving a corrective function. Therefore, a major category of feedback for this study is appropriately corrective feedback. While corrective feedback can take various forms (Dempsey, Driscoll, & Swindell, 1993; Kulhavy & Stock, 1989), this type of feedback strives to give information to the learner about the learner's performance and aims to increase learning through error correction. Thus, the focus of corrective feedback is about specific content of the task performance.

In a 1993 study, Dempsey, Driscoll, and Swindell categorized corrective feedback into five types, based on complexity, or the amount of information and what kind of information is contained in the feedback (Mory, 1996). These five types include no feedback given, simple verification or knowledge of results (KR), knowledge of correct response (KCR), elaborated feedback, and try-again feedback.

Among the types of corrective feedback, elaborated feedback is more substantial than the others, as it goes beyond verification to include more information to guide error correction (Kulhavy & Stock, 1989). Elaborated feedback may be task specific and drawn from the initial task demand or initial question, or instruction-based by containing material from the past lesson/instruction, or extra-instructional by giving additional information not provided in the initial lesson (Kulhavy & Stock, 1989).

Motivational Feedback

In addition to the corrective purpose, a second important function of feedback identified in the literature is to provide motivation to the learner to perform a task or to learn. Whereas corrective feedback focuses on the specific task content, motivational feedback is focused on the learner. The individual differences found in learners affects their motivation, and these differences affect feedback needs (Smith & Ragan, 1993). Motivation impacts the ways in which learners perform on learning tasks (Hoska, 1993), and a lack of motivation can lead to an increase in learner errors (Smith & Ragan, 1993).

The first way in which feedback provides motivation for the learner is by responding to the learner's instructional goals (Dempsey et al., 1993). Instructional goals, whether self-generated by the learner or assigned by the instructor, require feedback to aid in their achievement (Dempsey et al., 1993). Thus,

feedback encourages the learner towards meeting the goals. Motivational feedback aims to reorient the learner to the notion that goals should be focused on learning and effort rather than performance (Hoska, 1993) and to assist the learner in continuing effort despite challenges and setbacks (Sales, 1993). Motivational feedback can be made personally relevant to the learner by helping the learner to gain a sense of control over the learning (Hoska, 1993). By using personal interests in feedback, there is an increased motivational result (Ross & Morrison, 1993), and the sense of control provides an intrinsic motivation for the learner to engage in the learning process (Doherty, 1998). By aiding learners to take charge of success and failure as a function of their own personal effort (Hoska, 1993), motivational feedback gives learners a sense of personal relevance and ownership of the instruction.

Thus, while the literature has clearly demonstrated the importance of instructor-student feedback (in particular, corrective and motivational feedback) to the learning process, there is still a lack of detailed understanding of its actual use in the DE virtual classroom. This study builds upon previous research of feedback by analyzing in detail the frequency and proportion of both corrective and motivational feedback in a single, online distance learning course. Specifically, the aims of the study are:

1. To determine the types of feedback used
2. To determine the frequency of each type of feedback
3. To determine how feedback differs in types and frequencies when directed at an individual versus a team or group of students

As Mory (2004) asserts: "there is ever-increasing need to consider how new technologies…change and impact feedback, its forms, and its dynamic potential for use in instructional settings" (p. 777).

Method

This study utilized a case study design and content analysis to investigate the type, frequency, and timing of instructor-student feedback in an online course (Stake, 1995; Creswell, 1998; Fraenkel & Wallen, 2000).

Sample

Sixteen adult students and one instructor participated in an online distance masters course offered during the fall 2000 semester by the Instructional Systems Design department at a large, public research university in the Midwest. As a project-based and group-based program, students entered the program and immediately began working intensively with teams on project-based lessons in an instructional design and development course. The students and instructor engaged in course activities through the use of a learning management system to have asynchronous online discussions and synchronous online chat sessions. The course also used e-mail for general communications between the instructor and the students and for turning in and handing back completed written assignments (e.g., attached electronic files).

Procedure

Document analysis (Schwandt, 1997) of the instructor-student feedback interactions was conducted on the four primary document forms used in the course: 1) asynchronous online postings in the learning management platform used in the course; 2) transcripts of synchronous chat postings in the learning management platform; 3) instructor-student e-mails, and 4) graded written assignments. Content analysis (Fraenkel & Wallen, 2000) was conducted for each type of document to identify and categorize each instance of instructor-student feedback. The unit of analysis in the study, therefore, was a single feedback interaction. Each document that was reviewed (e.g., e-mail messages, etc.) often contained more than one feedback interaction. For example, a graded assignment may have included feedback from the instructor regarding both the visual design of instructional materials and about managing the group processes in the course, which are two completely separate ideas. Thus, each instructor-student feedback interaction was coded as a separate thematic unit (Krippendorff, 1980). Task demands initiated by the instructor that do not refer to or respond to a student message or input were excluded from the data (i.e., they are not considered feedback).

To enable accurate and consistent coding of each instance of instructor-student feedback, the following Feedback Classification Flowchart was developed:

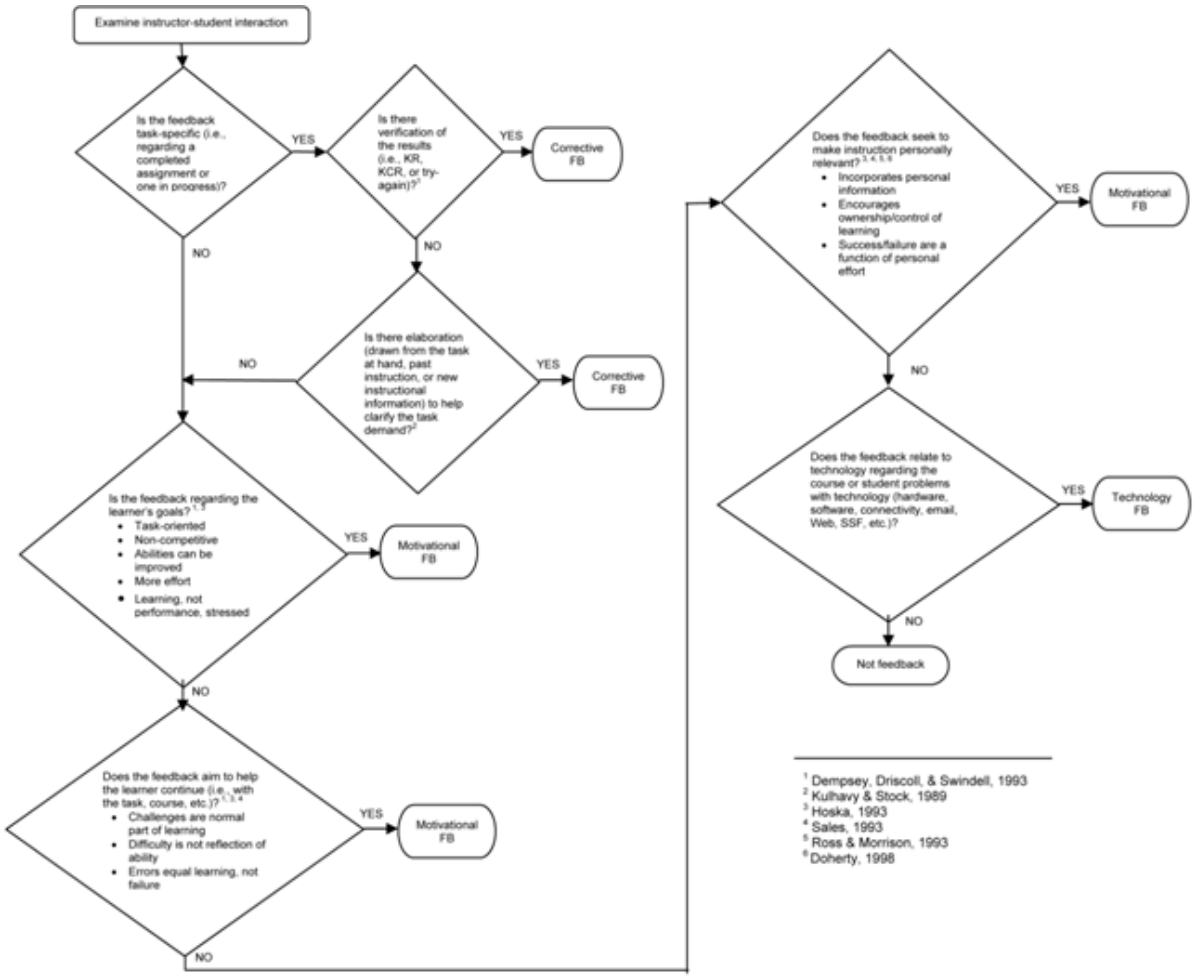

Figure 1. Feedback Classification Flowchart. (Click here for larger version)

The flowchart used the framework from the literature to determine corrective, motivational, and technology feedback for each feedback interaction. The first category was corrective feedback, information from the instructor to the learner about the learner's performance to increase learning through error correction. Corrective feedback was defined as having the characteristics of one of four specific forms: simple verification/knowledge of results (KR), correct response feedback or knowledge of correct response (KCR), elaborated feedback, and try-again feedback (Mory, 1992; Dempsey, Driscoll, & Swindell, 1993; Kulhavy & Stock, 1989). The second type of feedback in the study was motivational feedback, information from the instructor to the student that served a motivational function by encouraging the learner to perform a task or to learn. Motivational feedback is defined by its performing one of the following functions: strengthening the incentive of learning goals, assisting the learner to continue effort, or making instruction personally relevant to the learner (Dempsey, Driscoll, & Swindell, 1993; Kulhavy & Stock, 1989; Hoska, 1993; Sales, 1993; Ross & Morrison, 1993; Doherty, 1998). Technology feedback was the third type of instructor-student feedback, which had emerged in a previous pilot study with a small sample of the data and refers to instructor-to-student interactions that deal primarily with technological support issues used to negotiate the hardware and software issues the students encounter in the Web-based learning environment. This type of feedback relates to the technological issues in the broader context of learner support (Tucker, 1995; Threlkeld & Brzoska, 1994).

In addition to classifying the instructor-student feedback as either corrective, motivational, or technology, interactions were also classified as being either individual or team feedback. The point during the semester when the feedback occurred was also recorded. Frequency counts were made to determine

the number of times each type of feedback interactions occurred. In addition, measures of central tendency were examined to draw conclusions about which types of feedback were predominant.

Interrater Reliability

To establish reliability of the classification process, a second rater was used for interrater reliability using a 100 item sample dataset through random stratified sampling, proportional to the number of feedback interactions found in each of the data sources (i.e., types of documents). The second rater used the feedback classification flowchart to examine each item independently to determine whether it was corrective, motivational, or technology feedback. Overall, there was 95% agreement.

RESULTS

All of the instructor-student feedback recorded in the course was coded, categorized, and counted to determine the frequency of each type of feedback. In total, there were 1744 discrete or separate feedback interactions during the semester. Of these, 1200 were corrective in nature, 372 were motivational, and the remaining 172 were technology related. In percentages, they were 69%, 21%, and 10%, respectively. Corrective feedback accounted for greater than two-thirds of all feedback, which was more than three times the frequency of motivational feedback and almost seven times the frequency of technology feedback. Motivational feedback made up more than one in every five feedback interactions. Technology feedback, which has no direct instructional role and consists of assisting students to navigate the technological systems used to complete course activities, comprised one-tenth of all feedback given.

The tables which follow present additional detail on the instructor-student feedback. Table 1 illustrates a breakdown of the types of feedback in each document source, and Table 2 provides percentages of feedback in each data source and the course total.

Table 1. Data Source Analysis by Each Feedback Type and Total Feedback Interactions

Data Source	Corrective Feedback	Motivational Feedback	Technology Feedback	Total Feedback Interactions
Asynchronous posts	17	6	1	24
Chat posts	225	103	30	358
E-mail messages	103	42	54	199
Assignments	855	221	87	1163
TOTAL	**1200**	**372**	**172**	**1744**

Table 2. Feedback by Type Within Each Data Source As a Percentage of Total Feedback in the Entire Course

Data Source	Corrective Feedback	Motivational Feedback	Technology Feedback	Total Feedback Interactions
Asynchronous posts	1%	0%	0%	1%
Chat posts	13%	6%	2%	21%
E-mail messages	6%	2%	3%	11%
Assignments	49%	13%	5%	67%
TOTAL	**69%**	**21%**	**10%**	**100%**

It is interesting to note which forms of communication are associated with each type of feedback. For example, chat posts contain the highest percentage of motivational feedback, approximately one-third higher than the course average. The synchronous nature of the chats allowed for greater motivational feedback because it was the only opportunity for the instructor to interact with students in real time, fulfilling an instructional role to strengthen the incentive of learning goals, assist the learners to continue effort, or make instruction personally relevant to the learners. As such, the chat environment requires a higher level interpersonal, affective component. Students needed immediate feedback, and the chat

environment was used for troubleshooting student problems in the moment as they worked their way through course content and issues regarding completion of tasks.

In contrast, the assignment feedback documents have the highest percentage of corrective feedback: nearly three-quarters of all assignment feedback is corrective in nature. The assignment feedback was given asynchronously as comments made in-line on completed assignments or in self-contained feedback reports (i.e., separate reports written by the instructor to accompany the assignments). Though motivational feedback also plays a role in assignment feedback, as did technology feedback, corrective feedback is most prevalent because the assignments represent a completed task demand. The corrective feedback let the students know how well they did and where their assignments succeeded or failed to meet the criteria, while motivational feedback was used to encourage the students as well. Given that it was an online distance learning environment, technology feedback was also present. Even when a task had been completed, technology issues remained for the students and instructor.

Table 3. Feedback Examples by Type

Feedback Type	Example from Raw Data
Corrective	"This is obviously true, but … I would have liked to see you go beyond stating the obvious and spend more time applying the lessons of the text to your particular situation."
	"It would be helpful if you provided a paragraph or two that gives a brief overview of the document."
	"This isn't really an objective – an objective tells what you want the students to learn. This is actually one of four modules that make up the instruction. Modules are sub-sections of instruction that have their own series of presentation-examples-practice-feedback-testing. Your objectives for this module are stated in the section below."
Motivational	"9 hours is a lot in grad school particularly at a distance, and when you are working fulltime as well. Hang in there!"
	"Remember that things typically move slow in groups at first... this is part of the … process that you heard a little about during orientation …So, try to bear with the slower pace for a little bit while everyone in your team gets oriented to the course, the project, and to each other."
	"I greatly appreciate your willingness to learn, to experience cognitive dissonance sometimes, to put up with that dissonance and challenge yourselves to resolve it, and to find lessons from the text and the group activities that fit your own personal needs and your unique situations. The people I most respect in the world are the people who look for lessons from each and every situation they experience, and your reflections here demonstrate that you are committed learners."
	"I understand your concern about adjourning from this team and moving into the next one - it sounds like you all have such a great group. Hopefully, the lessons you've learned here will carry over to the next team and it will be great, too."
Technology	"If you close out of this chat and click on the discussion topic 'week 9: concept learning' then scroll down beyond the chat link, you should see some discussion there."
	"You guys should be able to use the personal web pages servers at Residential University to do this... I can give you instructions on how to do this. I was assuming that you would just pass html files back and forth in your SSF team folder (the same as you would with MS Word documents), and hand those files in to me when you are finished with the project."
	"All you should need is "Acrobat Reader" and it's part of the [browser] software. If you need to download it, you can get it free at…[the Adobe website]"

E-mail messages are an interesting case, since the amount of technology feedback occurs in greater proportion that in other data sources. Where the chat posts and assignments gave the instructor the opportunity to give students regular or lengthy feedback, respectively, students chose to e-mail the instructor with technology issues, as indicated by the amount of technology feedback given. E-mail feedback also had the lowest percentage of corrective feedback of all data sources. Just over half of all feedback in e-mail is corrective, as compared to two-thirds for all sources combined. Therefore, the instructor used e-mail to provide instructional support as needed but at a lower rate than other means of communication.

To take a closer look at examples from the raw data regarding each feedback type, Table 3 provides corrective, motivational, and technology feedback samples.

Individual Versus Team Feedback

Feedback also differed in types and frequencies when directed at individuals versus teams or groups of students (i.e., all feedback directed at more than one student was operationally defined as team feedback). Individual feedback and team feedback were counted and compared by type and frequency and converted to percentages (Table 4).

Table 4. Percentage of Each Feedback Type Directed Towards Individuals Versus Teams Within Each Data Source

	Corrective Feedback		Motivational Feedback		Technology Feedback		Total Feedback Interactions	
Data Source	Indiv.	Team	Indiv.	Team	Indiv.	Team	Indiv.	Team
Asynchronous posts	53%	47%	33%	67%	100%	0%	50%	50%
Chat posts	64%	36%	39%	61%	33%	67%	54%	46%
E-mail messages	54%	46%	57%	43%	37%	63%	50%	50%
Assignments	28%	72%	93%	7%	98%	2%	46%	54%
TOTAL	**37%**	**63%**	**73%**	**27%**	**67%**	**33%**	**48%**	**52%**

There is a fairly equal split between the total amount of individual and team feedback: 48% versus 52%, respectively. Looking at how the feedback breaks down by source, however, reveals a new picture about how feedback was directed at individuals versus teams and for what aims and purposes. For example, for corrective feedback, team feedback outweighs individual feedback by roughly a 60-40 split, whereas motivational feedback occurred at nearly the opposite rate, with a 70-30 split in favor of individual feedback. The last category, technology feedback, also tended to be directed towards individuals more frequently than towards teams overall with a similar percentage as the occurrence of motivational feedback.

Table 5. Each Feedback Type Directed Towards Individuals Versus Teams As a Percentage of Total Feedback in the Entire Course

	Corrective Feedback		Motivational Feedback		Technology Feedback		Total Feedback Interactions	
	Indiv.	Team	Indiv.	Team	Indiv.	Team	Indiv.	Team
Proportion of Total Course Feedback	26%	43%	16%	6%	7%	3%	48%	52%

Table 5 illustrates mixed results concerning how much of total feedback in the course is comprised by these categories—both team versus individual and the corrective, motivational, and technology analyses. While these three categories showed approximately a 70-20-10 split, respectively, the individual versus team comparison sheds a new light. Individual-corrective feedback is about 26% and team-corrective

feedback is about 43% of all course feedback. This difference is certainly influenced by the nature of the course, which relied on team projects. Next, individual-motivational feedback accounts for 16% of course feedback, versus almost 6% for team-motivational feedback. Finally, individual-technology feedback is nearly 7% and team-technology feedback is just over 3% of all course feedback.

Changes in Feedback Types and Frequencies During the Semester

During analysis of the data, a pattern of feedback distribution began to emerge regarding how corrective, motivational, and technology feedback changed over time during the progress of the semester. An interesting finding in this line of inquiry is how much motivational feedback was required during the first month of the semester. Approximately 41% of all motivational feedback given in the course occurs in September, shown in Table 6. The two highest months for motivational feedback contain over 70% of the course feedback combined. Technology feedback is also highest in September, and it remains a necessary component of the course throughout the semester. The rate of corrective feedback more closely mirrors that of overall feedback, starting out slightly slower in September and peaking in October and November.

Table 6. Percentage of Each Feedback Type Per Month

Month	Corrective Feedback	Motivational Feedback	Technology Feedback	Total Feedback Interactions
September	25%	41%	34%	29%
October	32%	20%	23%	28%
November	33%	30%	27%	32%
December	11%	8%	16%	11%
TOTAL	**100%**	**100%**	**100%**	**100%**

The distribution of all feedback given in each of the first three months of the course is fairly steady, but the final month of the semester shows a drop-off in feedback, likely due to the fact that the semester ended near the middle of the month. Looking at a month-by-month breakdown (Table 7), there is a dominant flow of corrective feedback, which accounts for three of the largest portions, in November, October, and September, respectively, followed by motivational feedback in September and corrective feedback in December.

Table 7. Percentage of Each Feedback as a Portion of Each Month's Total Feedback

Month	Corrective Feedback	Motivational Feedback	Technology Feedback	Total Feedback Interactions
September	58%	30%	12%	100%
October	77%	15%	8%	100%
November	71%	21%	9%	100%
December	71%	15%	14%	100%
TOTAL	**69%**	**21%**	**10%**	**100%**

Discussion and Implications

Perhaps the most striking result of this study was the disproportionate use of corrective feedback vis a vis motivational feedback. The effectiveness and value of the different types and frequencies of feedback were not addressed in this study, so no conclusion is made regarding the "correctness" of the proportions of corrective and motivational feedback were "incorrect." However, the disparity in frequency between the two types of feedback should trigger reflection by other instructors about the proportions of corrective and motivational feedback in their own courses. It was interesting to these researchers that the instructor in the course noted that the course was developed by others to be based on a constructivist instructional approach, and that the instructor was surprised to learn that she used corrective feedback about 70% of

the time. She had thought that motivational feedback, prominent in the constructivist feedback paradigm, would have played a much greater role than corrective feedback. While this was a case study design and the results are not generalizable to the population of all instructors, one wonders if other instructors might not also be surprised to see the proportions of corrective and motivational feedback in their classes.

Corrective Feedback

Corrective feedback was a steady function throughout the semester to both teams and individuals, dominating all other forms of feedback for the duration. This is the primary feedback role of any instructor, and online learning environments are no exception. Corrective feedback accounted for greater than two-thirds of all feedback, which was more than three times the frequency of motivational feedback and almost seven times the frequency of technology feedback. Regarding individual versus team differences, corrective feedback was directed towards teams 63% of the time versus 37% for individuals. Corrective feedback was primarily found in written assignments, although chat posts and e-mails were also used by the instructor to provide this instructional function of error recognition and remediation through corrective feedback.

The implication for instructors is that the primary function of feedback, the corrective function, should be woven throughout the course as a regular and ongoing process. Every means that instructors have for giving feedback to students will contain corrective feedback, although not always at the same time.

Motivational Feedback

The second largest category of feedback in the course was motivational feedback, accounting for 21% of all course feedback. Motivational feedback was directed towards individuals versus teams at a ratio of nearly 3:1. One interesting conclusion for instructors is that motivational feedback may be highest at the beginning of the semester, as was the case in this course. In every learning environment, the course goals, activities, content, learning context or environment, and perhaps even the instructional model employed (e.g., project-based, team-based, etc.) will all affect individual students in different ways, requiring the instructor to provide a certain level of motivational assistance. This motivational feedback can be used to assist students to see their role in working in teams, to better understand their learning goals, to have a sense of control, to give more effort, and so forth. Course designers should be aware of how the course activities are scheduled throughout the semester to be cognizant of where students may need additional motivational boosts from the instructor.

Another interesting finding of the study was the extensive use of chats for motivational purposes. It is recommended that instructors use chats to provide motivational feedback, since the synchronous nature of chats can allow for this affective component to occur in real time and can provide instructors with the feedback from the student that the motivational feedback was received or that the student may require further feedback.

Technology Feedback

Technology feedback, with no direct instructional role save that of assisting students to navigate the technological systems used to complete course activities, impacted the instructor substantially: one-tenth of all feedback given fell into this category. While the percentage may not seem enormous, it should be reiterated that in this case there were 172 instances of technology feedback for only 16 students during a single semester, a substantial amount. The course instructor felt that it technology feedback would have accounted for a greater overall percentage of course feedback because of the burden in placed on instructor time and productivity. As with motivational feedback, individuals in the course required technology feedback at a much greater frequency than did teams—2:1 in this case. Technology feedback was highest at the beginning of the course, accounting for over a third of technology feedback given in the course.

In terms of the types of communication used in online learning environments, instructors should be aware that students will use e-mail to ask for technology assistance continuously throughout the semester. Almost a third of all technology feedback came from e-mail messages in this case, and it should also be noted that no other form of communication escaped being touched by technological issues. It is the technological nature of an online learning environment that such problems can and will arise, and students use every opportunity or means of communication to address them. Certain content areas may also require additional technologies to be used in the course, beyond a learning management system or communications technologies, such as specialized software used in that particular field. Course instructors should recognize that technology feedback needs may increase in these cases.

Instructors should take measures to proactively address technological issues beforehand, such as a course FAQ page. Students could also participate in the FAQ by adding their own solutions, perhaps in the form of a threaded discussion of asynchronous posts. Of course, this may not handle every problem, but it could be used to stem the tide somewhat and could also assure that repeat issues do not become the responsibility of the course instructor to handle every case. Ultimately, using such a collaborative system may also lead the students to feel a greater sense of ownership and community in the course, to see that the technological issues are the domain and responsibility of all involved. In this sense, what had been only a technology issue could then play a motivational role as well.

Concluding Remarks

Feedback has been defined and discussed from several perspectives in the literature. Behaviorists tend to focus on feedback as reinforcement for correct answers and the information-processing perspective focuses on feedback as error correction and analysis (Mory, 1992). The constructivist paradigm emphasizes the role of feedback as an aid to increase a learner's self-efficacy and to help a learner gain a sense of control over his learning (Jonassen, 1991). The notion of feedback, therefore, pervades different learning theories, though the adherents to the various paradigms may disagree on its operational definitions. These disagreements are not the focus of this study, since the study is framed by the commonalities instead. However, it is asserted that these views of feedback are not mutually exclusive and should each be reflected in the totality of instructor-student feedback given in a course.

The findings of this study are useful for providing a roadmap or guideposts for instructors, to examine how to incorporate feedback into the classroom and to provide an opportunity to reflect on the personal teaching style and educational philosophy that drive instructional decisions. It should come as no surprise that the business of teaching involves providing a great deal of corrective feedback to students as they work through course content and activities. Being aware of the amount of corrective feedback will help instructors better understand themselves as teachers. Whatever the amount of corrective feedback is, a substantial amount of motivational feedback is also required in all learning environments. Though the overwhelming majority of guidance instructors give students may be corrective in nature, instructors must also motivate and inspire students to try harder, stick with it, and take control of their learning. To do so, instructors should examine their personal teaching style and be cognizant of the affective aspects of the feedback they provide. Teaching requires leadership, and to effectively lead, that would require motivating as well as correcting students. And if students are adequately motivated to take control of their learning and to be task oriented and to understand that academic success is directly related to effort, perhaps the amount of error correction on the part of the instructor will decrease.

There is one final note about technology feedback that cannot be overlooked. New forms of instructional media and technologies for learning are constantly being created, and instructors should expect this to continue. With every new technology, or even with old ones, all teachers will need to provide technology feedback to students. A tenth of all feedback in this study addressed technological issues, which is a significant amount when it is realized that it has no direct instructional implication other than assisting students to navigate their way through the learning environment. It is easily viewed as a distraction and a nuisance. Imagine if residential students needed to be told how to sit at a desk or physically hand in a paper, yet addressing their online counterparts is a regular occurrence. Therefore, online instructors should plan to address technological issues proactively as best they can to help minimize their impact. There is a great deal of research being conducted in best practices in dealing with these very sorts of issues, as any teaching conference schedule can attest. Instructors must look to these methods to apply to their own teaching and also share their experiences with others. Over time, maybe the burden of technology feedback will be reduced, which would allow instructors to get back to the "real" business of teaching.

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