Efficacy of Peer Feedback in Online Learning Environments

Peggy A. Ertmer
Jennifer C. Richardson
Brian Belland
Denise Camin
Patrick Connolly
Glen Coulthard
Kimfong (Jason) Lei
Christopher Mong

Contact Info:

Peggy A. Ertmer
Purdue University
3144 Beering Hall of Liberal Arts and Education
100 N. University St.
West Lafayette, IN 47907-2098
Fax: 765-496-1622
Phone: 765-494-5675
Email: pertmer@purdue.edu
Efficacy of Peer Feedback in Online Learning Environments

Abstract

This exploratory study examined the use of an innovative instructional approach for online learning, peer feedback. While peer feedback has been demonstrated to support students’ learning in traditional classrooms (Mory, 2004; Topping, 1998), little is known about its efficacy in online environments. This study examined students’ perceptions of the perceived value of giving and receiving peer feedback, specifically related to the quality of discussion postings, in an online course. In addition, we investigated the impact of that feedback by comparing the quality of students’ postings, based on Bloom’s taxonomy, from pre- to post-course. Results suggest that the quality of students’ postings was maintained through the use of peer feedback despite students’ preferences for instructor feedback. Students noted that peer feedback can be valuable, and more importantly, described how giving peer feedback not only reinforced their learning, but enabled them to achieve higher understanding.

Keywords: Peer feedback; Online learning environments
Feedback has been demonstrated to play an important role in instruction (Mory, 2004, Topping, 1998) with many learning theorists positing that it is essential to students’ learning (Driscoll, 2000). In general, instructional feedback provides students with information that confirms what they already know or that changes their existing knowledge and beliefs (Mory). Higgins, Hartley, and Skelton (2002) noted that feedback that is meaningful, of high quality, and timely helps students become actively and cognitively engaged in the content under study, as well as in the learning environment in which they are studying.

Compared to traditional classrooms, feedback may play an even more important role in online environments (Lynch, 2002; Palloff & Pratt, 2001). That is, students in online courses are more likely to disconnect from the material or environment due to a lack of feedback than students attending face-to-face courses. While instructor feedback is often cited as the catalyst for student learning in online environments, the lack of feedback is most often cited as the reason for withdrawing from online courses (Ko & Rosen, 2001; Lynch; Palloff & Pratt).

Because of the importance of feedback in online environments, a number of recommendations have been made for increasing its effectiveness. Notar, Wilson, and Ross (2002) specifically called for feedback that was “diagnostic and prescriptive, formative and iterative, and involving both peers and group assessment” (p. 646). According to these authors, feedback should focus on improving the skills needed for the construction of end products, more than on the end products themselves. While students agree that feedback needs to contain a summative aspect, they also desire formative comments. As Schwartz and White (cited in Mory, 2004) reported, students expect feedback in an online environment to be: 1) prompt, timely, and thorough; 2) ongoing formative (about online discussions) and summative (about grades); 3) constructive, supportive, and substantive; 4) specific, objective, and individual; and 5) consistent.
Indeed, research has shown that the quality of student discussion responses can be increased through the use of constructive feedback that is prompt, consistent, and ongoing (Ertmer & Stepich, 2004). However, to attain this level of feedback in online courses, instructors must invest a significant amount of time and effort. In other words, increased effectiveness comes at the price of decreased efficiency. Thus, in order to meet students’ needs for prompt and ongoing feedback, an instructor would have to be online almost continually (Dunlap, 2005), a suggestion that is not only impractical, but also incongruent with the types of independent, self-directed learning being promoted through online courses and among online students (Dunlap & Grabinger, 2003).

One possible solution is for instructors to capitalize on peer feedback as an instructional strategy, allowing students to provide feedback to one another while simultaneously promoting greater levels of interaction. As noted by Maor (2003), feedback "can no longer be considered the sole responsibility of the instructor because there is a much larger focus on dialogue…[and] the joint construction of knowledge" (p. 128). Depending on how the peer feedback is structured, instructors could be spared from evaluating large numbers of student postings, yet still provide as many instances of formative and summative feedback as needed. Students, on the other hand, would still receive the feedback they required in order to assess their progress in the online environment. While “peer feedback might not be of the high quality expected from a professional staff member, its greater immediacy, frequency, and volume compensate for this” (Topping, 1998, p. 255).

The use of peer feedback as an instructional strategy in an online learning environment offers a number of distinct advantages including: increasing the timeliness of feedback, providing new learning opportunities for both givers and receivers of feedback, humanizing the environment,
and building community (Corgan, Hammer, Margolies & Crossley, 2004). By asking students to provide constructive feedback to each other, they participate in each other's learning and thus achieve greater understanding and appreciation for their peers' experiences and perspectives. Moreover, by engaging students in the feedback process, meaningful interaction increases: interaction with peers and interaction with the discussion postings, thus promoting students’ satisfaction with the course (Richardson & Swan, 2003) and with the instructor (Fulford & Zhang, 1998). Ultimately, if used effectively, both instructor and peer feedback have the potential to increase the quality of discourse, and thus the quality of learning, in the online environment.

In addition to the benefits of receiving adequate feedback, students may also benefit from giving peer feedback. Liu, Lin, Chiu, and Yuan (2001) proposed that, when asked to offer feedback to peers, students progress beyond the cognitive processes required for completing a given task, as they must now “read, compare, or question ideas, suggest modifications, or even reflect on how well one’s own work is compared with others” (p. 248). McConnell (2002) suggested that collaborative assessment moves students away from dependence on instructors as the only, or major, source of judgment about the quality of learning to a “more autonomous and independent situation where each individual develops the experience, know-how, and skills to assess their own learning” (p. 89). Thus, students are offered the opportunity not only to reflect on the work of their peers, but also on their own work, which over time, can lead to increased learning (Dunlap & Grabinger, 2003).

Although peer feedback can add value to both the instructional and learning process, it is not without its challenges. These challenges include overcoming students’ anxiety about giving and receiving feedback (especially negative feedback), and ensuring reliability, to name just two.
According to Palloff and Pratt (1999), “The ability to give meaningful feedback, which helps others think about the work they have produced, is not a naturally acquired skill” (p. 123). In terms of implementation, Topping (1998) noted that “both assessors and assesseees might experience initial anxiety about the process” (p. 256), but suggests that this may be mitigated by asking students to provide positive feedback before providing any negative feedback. Topping also suggested that learners may perceive peer feedback to be invalid, thus causing low-performing students to refuse to accept negative feedback as accurate. These concerns over accuracy and validity may, in fact, be justified, based on the tendency for students to either inflate or deflate scores (Topping, 1998).

It is unclear whether challenges related to giving and receiving peer feedback in a traditional environment will be exacerbated or mitigated when applied within the online environment. Tunison and Noonan (2001) reported that many students found it difficult to communicate complex ideas in an online environment, and that their ability to express their questions clearly and comprehend detailed explanations was limited by the lack of face-to-face interaction. Arbaugh (2000) reported that while student participation in online course discussions tends to be more equal and at a higher level than in traditional settings, this interaction may not be as effective as face-to-face interaction—at least not until participants achieve a level of comfort with each other. If peer feedback is to benefit all members of the learning community, these are issues that must be addressed (Preece, 2001).

While feedback has been demonstrated to be effective strategy in traditional learning environments, its use in online earning environments has not been extensively implemented or researched. According to Mory (2004), “Although there has been progress in determining ways in which feedback can best be used under certain conditions, there are still many areas in which
the feedback literature is not consistent and yet other areas that have been left unexplored” (p. 771). For example, limited research has been conducted that examines the role or impact of feedback in online learning environments in which learners construct their own knowledge, based on prior experiences and peer interactions. Furthermore, very few, if any, studies have examined the impact of using peer feedback to shape the quality of discourse in an online course, as opposed to the quality of written assignments. Thus, the purpose of this exploratory study was to examine the implementation and impact of the use of an innovative instructional approach for online learning environments, peer feedback. Specifically, this study examined students’ perceptions of the value of giving and receiving peer feedback, related to the quality of discussion postings, in an online course. The research questions included:

1. What is the impact of peer feedback on the quality of students’ postings in an online environment? Can quality be maintained and/or increased through the use of peer feedback?

2. What are students’ perceptions of the value of receiving peer feedback? How do these perceptions compare to the perceived value of receiving instructor feedback?

3. What are students’ perceptions of the value of giving peer feedback?

Methods

Overview

Using a case study framework, we conducted an in-depth study of the use of peer feedback in an online environment that was situated within a semester-long, graduate level course in the College of Education at a large Mid-western university. Using both descriptive and evaluative lenses, we examined participants’ perceptions of the value of the peer feedback process and evaluated the impact of the process on the quality of students’ postings. Given that our research
was focused on a “contemporary phenomenon within a real-life context” (Yin, 2003, p. 1), a case study approach was considered appropriate. More specifically, our primary focus was on describing the process of giving and receiving peer feedback within a specific context in order to influence both future practice and future research.

**Role of Researchers**

The researchers in this study included two faculty members and seven graduate students (one female/six male) enrolled in an advanced educational research course in the educational technology program area at a large Mid-western university. The research team worked collaboratively to identify the specific research focus and to create data collection instruments (surveys, interviews) and interview analysis codes. Each team member took primary responsibility for collecting and analyzing data from a subgroup of two participants. All researchers had experience in online learning environments, and all were familiar with the scoring rubric (based on Bloom’s taxonomy) used by the participants in this study.

**Participants**

The participants included 15 graduate students (10 female, 5 male) enrolled in an online technology integration course during the spring semester of 2005. Eight of the participants were administrators, such as technology directors or principals, and three additional students were former or current teachers. Of those pursuing a graduate degree, five were masters and nine were doctoral students. The human subjects review board deemed this study exempt under university guidelines.

**Context and Procedures**

The online, graduate level course was co-taught by a professor and an experienced graduate assistant. Students met face-to-face (or via Internet-based video conferencing) for the first class
session; all subsequent interactions occurred electronically, within a WebCT course management environment. In addition to other assignments, the students were asked to respond to weekly discussion questions (DQs). In a typical week, students were expected to post at least one response to the discussion question and one response to another student’s post.

For this study, feedback was defined as 1) a numerical score (from 0 - 2) based on Bloom’s taxonomy and 2) descriptive comments, supporting the assigned score and relating specifically to the quality of the post. Postings at the knowledge, comprehension, and application levels received 1 point; postings demonstrating analysis, synthesis, or evaluation received 2 points; non-substantive comments received 0 points. Bloom’s was chosen as the means for determining quality due to students' prior experiences with the taxonomy. That is, students in the course were all education majors and had been introduced to, and/or had applied, Bloom’s taxonomy to assess levels of questioning and to determine instances of critical thinking among their students or peers. In addition, Bloom’s had been successfully implemented by the researchers in a similar graduate course. This was also in line with recommendations from Marra, Moore, and Klimczak (2004) who noted: "Researchers should choose a CMC [computer-mediated communication] analysis protocol that is both rigorous and proven, as well as designed to answer their research questions” (p. 39). The scoring rubric, adapted from Ertmer and Stepich (2004), provided the instructor and students, as well as the researchers, with a concrete tool for determining the quality of thinking embedded within online postings. Prior to using the rubric, students were provided with a variety of examples of possible responses, with an explanation of why each response merited a specific score.

Initially, two discussion questions were posted each week, with feedback provided by the two course instructors via e-mail. After observing the process modeled by the instructors,
students were asked to provide feedback to two of their peers beginning in week 7 and continuing for the following 6 weeks (peer review assignments were rotated each week). Groups were not self-contained: in other words, no two students were reviewing and being reviewed by the same students for the same DQ. To accommodate the additional effort required by the peer review process, online discussions were limited to one discussion question during those weeks.

All peer feedback was channeled through the instructors prior to being distributed. That is, using an online submission form, students reviewed their assigned postings, scored them using Bloom’s taxonomy, and provided comments to support the scoring. These results were then downloaded by the instructor and sorted by student. After reviewing the feedback and eliminating peer reviewers’ names, the instructor compiled and sent the feedback to students via e-mail. This process ensured anonymity and created a buffer in case the feedback was problematic. Instructor and peer feedback scores both counted toward students’ grades. Students received participation points for the peer review activity, but the act of providing peer feedback was not graded.

Data Collection

Quantitative and qualitative data were collected through participant interviews, scored ratings of students’ weekly discussion postings, and responses to both entry and exit survey questionnaires. Survey results captured students’ overall perceptions of giving and receiving feedback, while interviews provided insights into individual perceptions and personal experiences with the feedback process. Changes in posting scores, over the semester, were used to answer our research question regarding the impact of peer feedback on the quality of students’ postings.
Discussion postings. In order to ensure consistency in scoring students’ online postings, the research team scored all discussion postings, using the same rubric that students had used. While these were not the scores that students actually received during the course, they provided a better indication of the changing quality of the responses. That is, because students’ postings were rated by many different peers (each with their own interpretation of how to apply the rubric), it was important, for research purposes, to use a more consistent measure of quality. Furthermore, the students were not required to score each posting that a peer had made to a DQ; rather, only the two required postings were scored, thus making the students’ data set incomplete.

Two researchers rated all of the student postings. To ensure that the scoring was not influenced by the timing of the posts (with later scores automatically receiving higher scores), all evidence of DQ numbers, posting dates, and times was removed from these documents. To ensure consistency in scoring, the two raters scored a complete set of postings (n = 59) from a single randomly selected DQ. Working from separate printed copies, the raters scored the first ten postings independently and then verbally discussed their scores. After securing agreement on the first ten postings, the raters independently scored the next ten postings. Upon completion, the raters compared their results, tallied the number of disputed scores, and then discussed their differences. The raters proceeded with this process until all 59 postings were completed. The final results showed 86% agreement between the two raters. Following this, the two researchers divided and independently rated the remaining sixteen discussion questions, containing anywhere from 38 to 81 postings each.

Pre- and post-surveys. At the end of week 5, students completed a survey (13 Likert-style items; 5 open-ended questions) in which they rated their level of agreement (from 1-strongly disagree to 5-strongly agree) on the importance of various aspects of feedback (e.g., timeliness,
quality, quantity) and the extent to which the feedback they received, from the instructor, had met these criteria. Students described their typical responses to receiving positive and negative feedback (e.g., “When I receive feedback that is below my expectations, I tend to ...” and “The feedback in this course, has changed my postings in the following ways ...”) and their ideas regarding the most effective feedback methods in an online course. The initial survey served as a pre-measure of students’ perceptions, as students completed it prior to giving or receiving peer feedback. In week 16, students completed a post-survey in which they rated the importance of peer and instructor feedback and commented on the value of both giving and receiving peer feedback. Additional items were used to triangulate results from the interviews.

**Interviews.** Participant interviews were conducted to obtain more detail about individual thoughts and feelings arising from the peer feedback process (e.g., “How easy or difficult is it to use Bloom’s taxonomy as a scoring rubric?” “How do you feel about peers evaluating your postings?”) Each member of the research team interviewed two participants via telephone or in person. The interviews lasted 20 to 30 minutes, were recorded electronically, and then transcribed. Once completed, the interview transcriptions were sent to the participants for member-checking to ensure accuracy and completeness.

**Data Analysis**

To determine the impact of peer feedback on the quality of students’ postings, we compared average scores obtained on postings prior to the use of peer feedback (weeks 3-5) to those obtained during the peer feedback process (weeks 7-13) using a paired sample t-test. T-tests were also used to compare students’ ratings, on the pre and post survey, of the value of peer and instructor feedback. These results were then triangulated with ratings collected during participant interviews, conducted several weeks after the peer feedback process had started. Participants’
perceptions of the value of the process were compared across open-ended survey questions and interview responses. After selecting a set of standardized analysis codes, NUD*IST qualitative analysis software helped identify recurring themes and patterns across the interview data.

**Validity and Reliability Issues**

Validity concerns were addressed, primarily, through the triangulation of data sources. For example, survey results indicated how the majority of participants felt about instructor and peer feedback, while individual interviews provided opportunities for participants to elaborate on these ideas and provide more detailed explanations. The final survey, completed after the interviews, provided further verification of comments made during the interviews. In addition, transcribed interviews were member-checked to assure that the interview data were accurate and complete.

The use of Bloom’s taxonomy as the basis for the scoring rubric provided a relatively high degree of face validity as the participants in the course, as well as the researchers, all had previous experiences using it to distinguish between higher and lower levels of thinking. Variation in the use of the rubric was reduced by providing students with 1) sample postings and their scores (with rationale), and 2) instructor feedback on students’ initial postings, prior to being asked to apply the rubric to their peers’ postings. These training strategies helped ensure that the rubric scores provided a valid representation of the quality of students’ postings.

Finally, the use of multiple interviewers and evaluators helped eliminate interviewer biases, while the use of a standardized interview protocol helped increase the reliability of our data collection. Check-coding was used to establish inter-rater reliability for the analysis of online postings and interview data. In other words, the researchers coded the same data set and then came together to discuss initial difficulties and discrepancies, resulting in a common perception
of what the codes meant and which blocks of data related to which codes. This, then, served as a form of analyst triangulation. Finally, by including, in our results, a detailed description of participants’ perceptions, supported by quotes, readers are able to determine, for themselves, whether the conclusions presented “make sense” (Merriam, 1998).

Results

Perceived Value and Impact of Peer Feedback

At the beginning of the course, students believed that feedback in an online course was “slightly more important” than in a traditional course (M=3.6/5.0) and thought that feedback should be timely (M=3.8) and of high quality (M=3.9). Students considered the quantity of feedback received to be less important (M=3.3) than quality. By the end of the course, students’ perceptions of the importance of feedback in an online course had significantly increased (M=4.7; t[11]=2.24; p=.05), as had their expectations that feedback should be timely (M=4.3; t[11]=3.32; p=.007). (Note: Only 12/15 pre-surveys were returned.)

A paired t-test indicated no significant difference (t[14]=.29; p=.77) in the quality of students’ postings on discussion questions in which they received instructor feedback (weeks 3-5, M=1.31) compared to those on which they received peer feedback (weeks 7-13; M=1.33). Although the quality of students’ postings did not improve with peer feedback, neither did it decrease; thus, suggesting that peer feedback may be effective in maintaining quality of postings, once a particular quality level has been reached.

While significant changes in the quality of postings were not evident as a result of peer feedback, interview comments suggested that students (n=8) used information obtained from the feedback process to improve the quality of their postings.
Yes, it has impacted on my own posts. Because I remember the first time I got feedback [it said] "it is important to give an example." And so I try to put more examples in my answers.

Somebody scored me [as] a 2, and one gave me a 1 because they didn’t think I got to the higher levels of Bloom’s taxonomy; one did, one didn’t. You know, you sit down and you say, “Well, maybe there’s something I need to improve in how I write my answers so they could clearly see that I’m hitting that, so I now throw in words like, “In evaluating this concept, I believe…” I tend to use clearer terms to help them identify where I believe my thinking process is.

_Instructor vs. Peer Feedback: Perceptions of Value_

As expected, feedback from the instructor was perceived as being more important (M=4.3) than peer feedback (M=3.3) at the beginning of the course. In general, students disagreed with the statement that they would rather receive feedback from their peers than from the instructor (M=2.0). They explained that the instructor was more knowledgeable and, thus, should oversee scores that peers provide. By the end of the semester, students’ perceptions of the value of instructor feedback (M=4.6) did not change significantly; similarly, it was still perceived as being more important than peer feedback (M=3.7). A paired t-test \( t(11) = 3.19 \) showed the difference between the perceived values of instructor and peer feedback to be significant at the .009 level. Interview comments provided additional insights into why students preferred instructor feedback. For example, students expressed concerns that not everyone was motivated to provide quality feedback (n=5), that it took a great deal of time (n=4), and that the required nature of the process led to potential biases (n=3). One student noted:
The feedback was kind of superficial. You just kind of go through the motions—at least the stuff I’ve gotten back. There’s not really any real substance to it. If the person did not score at the highest level, [peers should] identify something that would take them to the next level or the highest level.

While acknowledging the benefits of peer feedback, additional comments point to the previous experience, unbiased approach, and general expertise of the instructor:

… It is good to know everybody else’s opinion. [And] I guess it can help you [move] to some other directions that might lead you to some more questions; but overall, it is not really going to change my perspective on the question.

I like the peer feedback better, in the sense of how it makes me feel. But as far as valuing what they're saying about me, I would value [instructor's] feedback more. Her grading was a little harder than what my peers has been, but it was probably more on target.

As noted above, even though students preferred instructor feedback, the majority of them (n=13) valued the peer feedback process, describing important aspects of the process (e.g., anonymous format; emphasis placed on it). As noted by one student:

This experience is more in-depth and, I would have to say, more positive [than in other courses]; because, if peer feedback is the sole source of feedback that we are getting, [it] … has to be more thorough and more comprehensive. Previous peer feedback experiences I've had were coupled with feedback from the instructor, and were seen more as a secondary measure. In this instance, as a primary measure, it has been a lot more valuable.

Additional benefits to receiving peer feedback included confirmation that their ideas were meaningful to others, as well as profiting from their peers’ insights and perspectives.
It’s nice to get some validation that what you had to say was important to somebody else, that they got something from it.

My impressions are that it is very beneficial to learning, in that peers often have different perspectives than the instructor, and there are significantly more of them, and they can provide a lot of insight and ideas that the instructor might not have noticed. Peers are more often on the same level and may be able to explain things in a manner that makes more sense than the instructor.

*Perceived Value and Impact of Giving Peer Feedback*

When asked on the post-survey to rate the importance of both giving and receiving peer feedback, students rated them at the same level (M=3.7); that is, as “important” to their learning. The significantly high correlation (r=.78; p=.003) between these ratings suggests that students, on average, did not perceive one aspect as being more important than the other. Those students who rated the process of giving feedback as important also thought that receiving peer feedback was important to their learning. In the interviews, students described how they reflected on the feedback they had given to peers as they formed their own responses to discussion questions. Moreover, several students (n=6) discussed specifically how the process of providing peer feedback increased their own learning. Comments from three students are illustrative:

I often think that the tutor or the person giving the feedback often learns more than the person receiving the feedback. … The person giving the feedback learns through the suggestions that they come up with in evaluating the response. They learn through the content of the person’s [post] they are evaluating, and they learn from their own thought process. So I think it's very beneficial to do.
I think that I considered more often how others would view what I was about to post and it made me consider alternatives and other ideas that I may have not thought of if I had not been doing peer feedback. It brought Bloom's taxonomy into a greater focus.

When you teach what you learn, you retain what you learned 300% better. When we present things to people who maybe don’t have [the same experience], we’re actually reinforcing our own learning much more strongly. So we’re gaining.

However, as with receiving peer feedback, students perceived difficulties with the process. The main concerns for giving feedback related to consistency and fairness (n=4). For example, one student commented, “I think peer feedback is good but, in some respects, I don’t know if I’m really qualified to give a grade to anybody.” Particularly worrisome to some students was having to give a 0-score. In fact, some students simply would not do this.

I am not sure if I could give a 0 to anyone because I don't feel that I have the power to say, "That's not a good idea."

Even though I don’t know them, I don’t think I’d give them a 0 … no.

This is supported by the peer feedback data. In approximately 160 peer-rated postings, peers gave a 0-score only 7 times (4%), and three of those instances were due to students not responding to the particular discussion question. Still, a few students (n = 4) indicated the issue was not that of assigning a low score, but of being a conscientious educator. These students believed that a low score provided a teachable moment, providing the opportunity to offer constructive criticism and suggestions for improvement. One student explained:

I offer constructive criticism. You have to help them. Just to say “Well, you didn’t make it” doesn’t do anybody any good, unless you say what you can do to make it better. So, it becomes a learning process for the reader.
Overall, the majority of students (n = 8) felt that the benefits of providing peer feedback outweighed the costs. While specific benefits related to improving the quality of their own posts (as well as their feedback to others), the main costs related to the time needed to do a good job. Still, students described the time commitment as appropriate to a graduate course, as well as relevant to their future careers, as noted by one student: “The skills associated with peer evaluation are going to carry on much longer than the course.”

*Perceived Benefits and Challenges to the Peer Feedback Process*

An important component of the feedback process in this course was the use of Bloom’s taxonomy as the basis for scoring. In general, the students (n = 8) responded favorably to this approach, describing how it provided more structure and guidance for achieving and acknowledging quality postings. For example, two students commented:

… The grading was done more consistently than in other courses I have taken, and there were specific things that were mentioned on every score that we received, in terms of the evaluation level that the instructor believed the (post) merited, and the exact characteristics of that level that were characterized by the response. … In previous courses, points were based on more subjective measures in terms of what the professor thought was an appropriate response.

It leveled the playing field for everyone and it did make it easier to respond. As I formulated my responses [it was useful] to know what the person would be looking for.

However, the use of Bloom’s taxonomy added a layer of difficulty to the course for which not all students were prepared. While two students explained that they needed time to adjust to using the rubric, two other students noted that it continued to be difficult to apply throughout the course: “I think it’s hard. [The taxonomy] is vague; the rubrics are pretty wide open.” One of
these students described his/her confusion while trying to decide which level of Bloom’s was most applicable to a response and often just settled on using the top level (evaluation).

In one case, a student felt constrained by the rubric, noting that it was kind of “undergraduate-ish” to rate each other’s postings using Bloom’s taxonomy; especially since many of the students in the class were high-level administrators. Furthermore, because students’ participation grades were based on scores provided by their peers, there was some concern by both givers and receivers about the potential impact of their evaluations. While some students (n=3) were worried that their peers were being too nice to them (thus not providing any valuable suggestions for improvement), others (n=3) worried that their grades would suffer because their scores were too low. As one student noted, “I see the importance. But I also think that the instructor should have the overall decision on how many [points] you get.”

Summary

Though participants’ perceptions of the importance of feedback in an online course significantly increased from the beginning of the course to the end, students continued to believe that instructor feedback was more important than peer feedback. Despite seeing no quantitative improvement in the quality of students’ postings during the peer feedback process, interview data suggested that participants valued the peer feedback process and benefited from having to give and receive peer feedback.

Discussion

Value and Impact of Feedback in an Online Environment

Results from this study highlight the importance of feedback in an online environment and support the assumption that students’ postings can reach, and be sustained at, a high level of quality through a combination of instructor and peer feedback. In general, students’ postings,
across 17 discussion questions, averaged 1.32 on a 2-point “quality” scale. Although we expected that the quality of students’ postings might gradually improve over the semester, as was demonstrated in a similar study by Ertmer and Stepich (2004), our results showed no significant improvement in students’ postings from the beginning to the end of the course. We suspect that a number of factors may have mediated students’ efforts to achieve high quality postings. First, the online course was structured such that students were required to submit two postings (for grading) each week: an “initial” post to the weekly discussion question, as well as one response to another student. Additional postings were not required, nor did students expect them to be scored for quality. Therefore, once the initial and follow-up postings were made in a specific forum, students had little motivation to strive for high quality with any additional postings. Furthermore, scoring postings with a grading rubric that allowed for only two meaningful levels of quality may not have provided enough room for growth, thus causing a ceiling effect to occur. Since students started out with relatively high scores on their two required posts, there was little opportunity to demonstrate improvement in these scores during the semester. In the future, it might be important to include a scoring rubric that allowed for more variation among scores. The disadvantage to this, however, is that as the scale becomes more finely gradated, it becomes increasingly difficult to differentiate among the various levels of quality.

Another reason students may not have demonstrated increased quality in their postings relates to the discussion starters used. In this course, many of the discussion starters, especially those developed by student leaders, were not particularly conducive to high-level responses. As Meyer (cited in Meyer, 2004) explained, “Questions created to trigger personal stories [do] so, and questions targeted to elicit information or higher-level analysis [do] so” (p. 112). Specific to this study, student leaders tended to ask their peers to provide examples of current issues they
faced in their classrooms or schools (e.g. how to integrate technology, how to cope with security issues, how to apply distance learning opportunities in the classroom). While these types of discussions might be expected to stimulate responses related to the application level on Bloom’s taxonomy (score = 1 point), they would not readily engender responses related to analysis, synthesis, or evaluation (score = 2 points). As Black (2005) noted, "most online discussion consists of sharing and comparing information, with little evidence of critical analysis or higher order thinking. Such findings serve to remind us that it is not the technology itself but the manner in which it is applied that is most critical” (p. 19). Thus, it is important for instructors to be cognizant of the development of discussion questions in such a way that allows students to attain higher-order thinking.

Communication in online courses serves many functions, only some of which are specifically content-focused (Ko & Rosen, 2001; Palloff & Pratt, 1999, 2001). However, in this study, we rated every response posted in 17 different discussion forums, including responses that were intended solely for interpersonal or motivational purposes. While these types of postings serve important roles, they would not be likely to receive a high-quality score, based on Bloom’s taxonomy. Given this, we considered scoring only the required posts in each forum; however, it was difficult to determine, post-hoc, which postings students intended to “count” as their required two postings. Additionally, this would have reduced the total number of analyzed postings from 778 to 160, which would have greatly limited our ability to measure changes in posting quality. In the future, it will be important to clarify exactly how many postings will be scored in a discussion forum, while also leaving room for students to make additional postings that serve to build a sense of community and trust.
Perceptions of Value: Peer vs. Instructor Feedback

Despite the fact that the quality of students’ postings was maintained with the use of peer feedback, students still tended to favor instructor feedback over that received from peers. Furthermore, despite participating in what they, themselves, described as a “valuable process,” students began and ended the course believing that instructor feedback was more important to their learning. This perception is similar to that reported by a number of researchers (Ko & Rosen, 2001; McKeachie, 2002; Topping, 1998) who have noted that students often believe that their peers are lax in their assessment approaches or that they lack required skills to provide valuable feedback. As Topping noted, if learners perceive peer feedback to be invalid, they may end up de-valuing the entire peer feedback process. This suggests the importance of explicitly addressing students’ perceptions, up front, and taking steps to counter their strong pre-conceived ideas of the relatively weaker value of peer feedback.

Specifically, in this study, students expressed concerns about being qualified to give feedback to each other. This may have led, on the one hand, to the perception that they were receiving superficial or low-quality feedback or, on the other hand, feeling apprehensive about being consistent and fair while evaluating peers’ postings. As noted earlier, “The ability to give meaningful feedback … is not a naturally acquired skill” (Palloff & Pratt, 1999, p. 123) and students may experience initial anxiety about the process (Topping, 1998). In this study, these concerns appeared related to a more fundamental concern about how peer scores would impact their grades, whether their own or others. To help the peer feedback process work most effectively, students need to be assured that postings will be fairly and consistently evaluated, with the instructor mediating the process to ensure fairness, and to appreciate the additional benefits made possible through the peer feedback process.
One of the potential advantages to using peer feedback, as noted by Topping (1998), is the increased timeliness in receiving feedback. However, in this study, students’ feedback was channeled through the instructor, thus causing a delay in delivery time—initially taking as long as two weeks. The significantly higher rating, at the end of the course, of the importance of timeliness of feedback may have been in reaction to the perceived delay in receiving peer feedback. This lag time, then, may have cancelled out one of the proposed benefits of peer feedback, that is, increasing the timeliness of receiving feedback.

Still, despite these logistical problems, the majority of students indicated that peer feedback positively impacted the quality of their discussion postings. They described a number of specific benefits from receiving peer feedback including recognition of their ideas, access to multiple perspectives, and receiving a greater quantity of feedback than would have been received from the instructor alone. Students also noted positive aspects of the peer feedback process, including the ability to provide anonymous feedback and the ability to receive a grade that reflected the average score given by two different peers.

In addition to impacting the quality of their discussion postings, students also described how peer feedback helped them improve the quality of the feedback they, in turn, provided to others. In other words, after receiving initial peer feedback, some students realized they had not been as in-depth or constructive as they could have been in providing feedback to others and, thus, improved the quality of their own feedback. Ko and Rosen (2001) noted that the ability to “cross-check” one’s understanding is an essential step in the learning process.

Learning by Doing: Benefits to Giving Peer Feedback

Perhaps the greatest potential benefit of the peer feedback process lies in the constructive aspect of forming and justifying peer feedback. For example, in this study many students...
described how they benefited from providing peer feedback. Through this process, they reflected more critically on the discussion postings for which they were providing feedback, as well as on their own postings and how they could be improved in a similar manner (Juwah, 2003). Many authors have suggested that this type of reflection contributes to the assessor’s comprehension of the topic by forcing him/her to reflectively analyze postings and to think about what constitutes high-quality work (Henderson, Rada, & Chen, 1997; Topping, 1998). According to Dunlap and Grabinger (cited in Dunlap, 2005), “The process of reviewing someone else’s work can help learners reflect on and articulate their own views and ideas, ultimately improving their own work” (p. 20). Furthermore, requiring students to justify their peer ratings by specifying which level of Bloom’s taxonomy was demonstrated in the peer response forced them to engage in activities at a higher level of cognitive skill: providing explanations, making justifications, and drawing conclusions (King, Staffieri, & Adelgais, 1998). Finally, Garrison, Anderson, and Archer (2000) argued that an essential element of online learning rests with what they referred to as "cognitive presence," which allows learners to construct meaning through sustained reflection and discourse; which is after all, the focal point of the peer feedback process.

Limitations and Suggestions for Future Work

Results of this study are limited by the small sample size, the relatively short duration of the study, as well as the fairly limited scale used to judge quality of student postings. Conducting the study over a longer period of time, with a rating scale that allows for greater improvement, could result in a measurable difference in the quality of student postings. Furthermore, providing more time, up front, to discuss the benefits of the peer feedback process and to train students to use the rating scale more effectively might impact students’ perceptions of the value of receiving feedback, particularly in relationship to the perceived value of instructor feedback. Given that
Peer Feedback in Online Learning

feedback is likely to become an increasingly complex and important part of the online learning process (Mory, 2003), it is important that educational practitioners have access to relevant information regarding how to effectively use peer feedback to increase student learning. While the results of this study suggest that peer feedback is a viable alternative to instructor feedback, specifically related to maintaining the quality of student postings, additional research is needed to determine the most effective means for facilitating the process in an online learning context.

Implications and Conclusion

Discussions play a key role in online learning environments, providing the primary means for students to exchange ideas, offer explanations, share multiple perspectives, clarify understandings, and engage in other types of high-level discourse (Dunlap, 2005; King et al., 1998). However, “facilitating discussions is the single most time-consuming and effort-intensive component of an online course” (Dunlap, p. 21). By implementing an instructional strategy, such as peer feedback, instructors can decrease the potentially overwhelming workload without jeopardizing students’ learning while also increasing interaction for and among students. In other words, strategies such as peer feedback, enable instructors to share the responsibility for learning with their students.

Results from this study highlight students’ perceptions of the importance of feedback in an online environment and specifically point to the expectation that feedback consist of quality rather than quantity, and that it be delivered in a timely manner. Although survey results indicated that students’ ideas about the value of peer and instructor feedback did not significantly change over the course of the semester, interview comments helped determine where the specific strengths and weaknesses of the feedback process occurred. While many of the strengths seemed to be related to the inherent value of participating in the feedback process (e.g., reflection during
the feedback process, improving posts and feedback), weaknesses seemed to be associated, at least to some extent, with the logistics of the process (e.g., time delay from providing feedback to receiving feedback). Perhaps if instructors can simplify the logistics involved in giving and receiving peer feedback, and can somehow assure the importance and validity of peers’ responses, students will be able to appreciate and accrue the potential benefits. Furthermore, if the use of peer feedback can decrease an instructor’s workload in an online course while continuing to maintain a high quality of postings, this may offer a viable alternative, or at least a reasonable supplement, to facilitating learning in an online course. That is, by addressing these logistical issues, it may be possible to increase both the efficiency and effectiveness of the process, as well as the perceived value for the participants. As summarized by one student:

I think that if [peer feedback] were developed a little more, I think it would be really effective. It seemed kind of OK. I think right now it’s of value to the person evaluating, but I don’t really think it’s much of a value to the person receiving it. It’s kind of like, “Ok great.” … That’s my opinion. I think it’s a good beginning, but I think it could be built much more.
References


*United State Distance Learning Association Journal, 17*(1), Article 04. Retrieved January
31, 2005 from: http://www.usdla.org/journal/JAN03_Issue/article04.html

interaction to scaffold peer learning. *Journal of Educational Psychology, 90*, 134-152.


York: Routledge.

forums: A comparative analysis of protocols. *Educational Technology Research and
Development, 52*(2), 23-40.

Maor, D. (2003). The teacher’s role in developing interaction and reflection in an online learning

Continuing Education, 24*(1), 73-92.


