Effects of an On-line Peer Feedback Management System in Oral Presentation Instruction[1]

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Abstract

Peer feedback has many benefits in second language instruction, but there are many factors to consider in choosing and implementing an appropriate and effective system. This paper describes these factors and then compares two different feedback management systems, one high-tech sytem that manages peer feedback through a computer network and one less-high tech system where users submit feedback via e-mail. Results of the study show that students using the high-tech sytem, called Feedbacker, write longer free response feedback comments and appear to be more likely to read the comments they receive. Students who received more feedback from their peers or from the teacher also showed greater improvement in later peer feedback scores. Finally, students found Feedbacker easy to use and appreciated being able to submit comments anonymously. The results suggest several ideas for improving on-line peer feedback management including the addition of mechanisms to encourage longer feedback contributions and to ensure that students read the feedback they receive.

Introduction

The use of peer feedback has a well-established place in education and specifically in second-language education (cf., Rothschild and Klingenberg, 1980) as a formative developmental tool. Throughout the literature, one can find cases of and arguments for several benefits to learners. Peer feedback promotes critical thinking (Orsmond, et al 2000), encourages higher audience awareness (Yeh, et al 2008), is potentially more informative than other feedback forms (Bartels 2003, Tsui and Ng 2000), and complements teacher's feedback (Stefani 1998). On the other hand, some criticisms of peer feedback from teachers and students include the observations that peers (i.e., students) lack expertise to give useful feedback and that students are hesitant to criticize their peers (Liu and Carless 2006). Nevertheless, when implemented efficiently and appropriately, peer feedback can be beneficial to learners (Falchikov 1995, Topping 1998).

Peer feedback is used widely in second-language education, perhaps most commonly to evaluate writing or oral presentations. One challenge, though, of using peer feedback in any course design is deciding what kind of peer feedback management system to use. Low-tech system such as giving immediate oral feedback after a writing exercise or an in-class presentation are apparently quite abundant as a web search for, say, “peer feedback form” will return a very large number of sample feedback forms that could be use as-is in most teaching contexts. Thus, this type of feedback management system is very easy to prepare for. But still, this system may be quite difficult to implement effectively in some teaching contexts. On the other hand, a high-technology feedback system that automates much of the feedback management might be very easy to use, but once again may be difficult to implement where technology support is not readily available.

This paper begins at this point by describing a set of logistical factors that underly the planning and implementation of any peer feedback management system, covering a full range of technological possibilities. Then, this paper describes a study of one high-tech management system which has

1 This paper is based in part on a presentation given at the International Certificate Conference (ICC) in Florence, Italy in 2009. I am indebted to several conference participants for insightful comments and discussion about peer feedback.

been developed by the author and compares it to a low/mid-tech management system. The two systems are compared in terms of how students used the two systems and their basic effectiveness in leading to improved performance. Finally, the paper finishes with some specific recommendations for how to implement an effective high-tech peer feedback management system and ideas for how such a system could improve both peer feedback on students language production as well as the language production itself.

Background

Factors describing peer feedback systems

Peer feedback systems vary widely from low-tech systems such as direct oral feedback or simple paper-and-pencil methods up to high-tech systems involving networked applications. Following are several practical factors that can distinguish systems at the level of implementation. These factors are not wholly independent as a system that places strong importance on one factor may necessarily have to de-emphasize other factors.

Set-up effort

This involves the effort necessary to prepare the basic logistics of the system (e.g., preparing handouts/forms, installing on-line systems). This is the time and effort required to get the system in place and differrs from burden of administering the system during an evaluative event (see below). For computer-mediated systems, this will obviously take much more time and will require more advance testing to ensure that the system will work smoothly. However, even paper-based systems may require a fair amount of set-up effort. An additional aspect of set-up effort is the time taken to prepare students to use thesystem. Again, high-tech systems may require explanations of how to access the system, log in, and use the system correctly. Low-tech systems ay require less effort.

Administrative burden

Each system has a certain amount of burden required to operate it during each evaluative event. This may involve processing each peer's feedback and channeling it to the target learner. In a high-tech system, it may involve registering a particular evaluative event with the system and preparing it to receive peers' feedback. In theory, high-tech systems should have a lower administrative burden since these systems are designed to automate many menial tasks often associated with systems administration. However, feature bloat can sometimes lead to a proliferation of additional required tasks, potentially offsetting any benefits of automation.

Classroom time

In many teaching contexts, classroom time is like a precious resource that should not be wasted. One question then, is how much class time to devote to giving feedback. In large classes with relatively small contact time per time, oral feedback immediately after each presentation may simply take too much time, or consume time that would be better spent on students' oral presentations. Even time to write down feedback may be too luxurious in some contexts or it may be regarded as ruining the momentum of the lesson. As such, some contexts may necessitate that students merely write notes during the presentation which can be expanded into more extensive feedback outside of class

Anonymity

In some teaching contexts, learners feel free to critique each other openly and honestly and accept

such criticism freely. In these cases, the preservation of anonymity in peer feedback is not crucial. However, in other contexts, anonymity is crucial for an effective peer feedback system. Learners may be hesitant to give any negative feedback lest it should result in a loss of face for the evaluated learner. Furthermore, they may even be hesitant to offer positive feedback if it could be viewed as conceited.

Turn-around time

Turn-around time refers to the latency between the production of the product that is being evaluated and the learner's receipt of peer feedback about that product. Intuitively, latency should be minimized in order for the learner's uptake to be optimal. However, an immediate turn-around time might not always be feasible, particularly when it is important that feedback be anonymous.

Permanence

This refers to the permanence of the feedback. In low-tech systems, the permance of the feedback may be very low. For instance, direct oral feedback may be very impermanent–dependent entirely on the memories of those who hear it (say, the target of the feedback and maybe the teacher, too). This could be improved by making audio recordings, but even those recordings are not easily searchable, for example, without further processing. High-tech systems, on the other hand, can be very permanent, and may provide immediate indexing possibilities as well as a corpus of feedback which may be abstracted automatically to inform future learning.

Illustrative feedback systems

In this section, three sample feedback systems are described and classified according to the above factors in order to illustrate these factors and provide a foundation for introducing the feedback system which is the focus of this paper to be discussed in the next section. The three systems here are intended to be broadly conceivable systems spread liberally along a low-tech to high-tech continuum. Since the system that will be described in the next section was designed to support a course on oral presentation, the sample systems described here will also be presumed to deal with peer feedback on oral presentations. However, I believe that the principles here are general enough to be readily adaptable to peer feedback on other kinds of language production (e.g., writing).

System 1: Direct oral feedback

In a direct oral feedback system, peers are asked to give feedback orally to a presenter after their presentation. This system has the benefit of being the easiest to set up logistically, though with some groups of students, it may take some effort to prepare learners to give feedack that is meaningful. Administering the system is relatively easy, even if teachers intend to keep a record of who gave feedback to whom and the overall quality of that feedback. The turn-around time can be optimized if it is arranged for feedback to take place immediately after each presentation, or even, say, collectively at the end of the lesson. However, feedback will not be anonymous and all presenters will know who gave them what kind of feedback. Furthermore, there is little permance to the feedback itself. Learners cannot easily refer again to the feedback they received earlier and must depend only on their memories which may be selectively biased in the feedback they remember. The permanence issue may be solved somewhat by maintaining audiovisual recordings of the feedback, but then the system for maintaining these recordings adds to the set-up time and administrative burden.

System 2: Paper-based feedback

In a paper-based system, peers write their feedback on a form and submit the forms to the teacher who collates them and distributes them to each presenter. Like the direct oral feedback system, this system has the advantage of requiring little set-up effort and having a low administrative burden. The turn-around time may also be low if the feedback papers are redistributed to presenters soon after their presentations. This may prevent permanence, though. If the teacher desires to keep a record of what kind of feedback learners are giving, it may be necessary to collect papers, process them (e.g., make copies), and return them in the next class. However, this would slow down the turn-around time as well as increase the administrative burden.

Anonymity is also not guaranteed with a paper-based feedback system as learners may easily recognize each others' handwriting. A mid-tech solution to this might be to have students submit their feedback electronically (via e-mail for example). The feedback can then be collated and returned to the presenters all in the same font, thereby preserving anonymity. This solution has the additonal advantage of greater permanence, but also has a larger administrative burden and a slower turn-around time. It is this variation of the paper-based feedback system that will be used as a basis for comparison in the experiment described later in this paper.

System 3: Computer-mediated feedback management system

This system involves a networked computer-based application designed to manage the receipt of feedback and redistribution of feedback to presenters. This type of system may have require the largest set-up time if the teaching context does not already provide such a system. However, once up and running, such a system should require very little administrative burden as most tasks will be automated. This type of system can have a fast turn-around time if learners are able to access the system after each presentation and input their feedback immediately. However, this is perhaps unlikely in most teaching contexts, so some turn-around time may be somewhat slower, though perhaps faster than waiting until the next class (as necessitated in the paper-based system). Anonymity of the feedback can be ensured in such a system and the permanence of the feedback means that it can always be available to the feedback giver, the feedback recipient, and the teacher. This is the type of system that was created in the present study and which is described in the next section.

Feedbacker

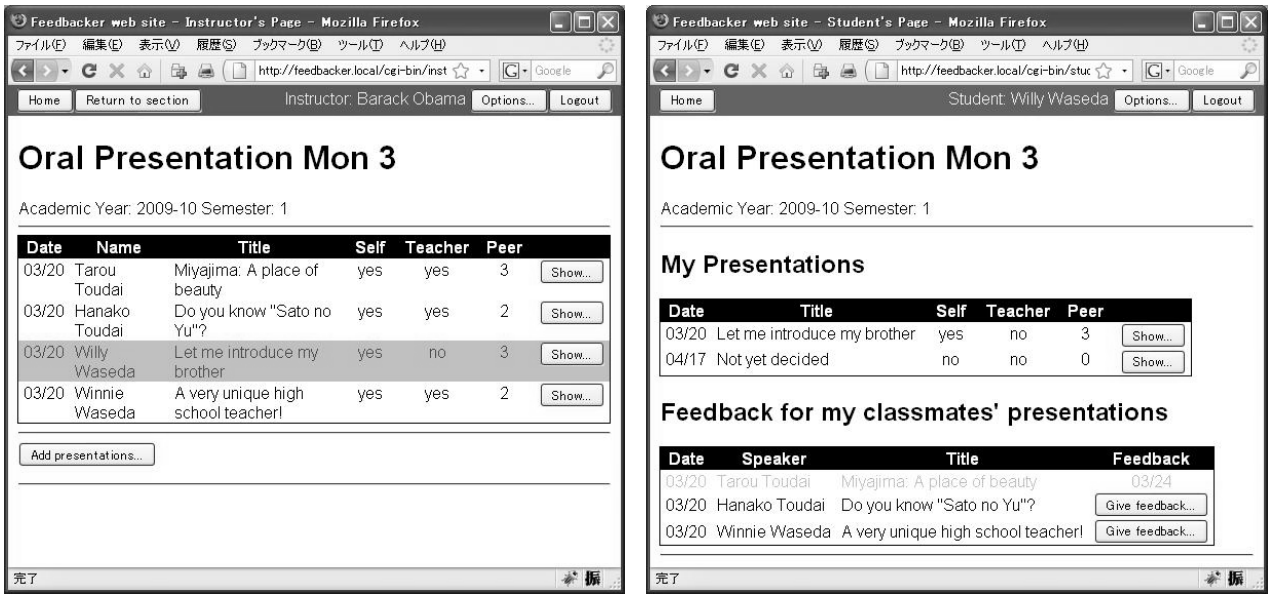
The Feedbacker system was born out of a need to manage peer feedback in a course in Japan on oral presentation. The classes would consist of approximately 10-15 students who would give 4 presentations during one 15-week academic term. Because face preservation is a crucial aspect of academic culture in Japan, anonymity was very important. As a result, direct oral or handwritten feedback systems rejected. The first system (pre-Feedbacker) was a slightly higher-tech version of the paper-based feedback system described above. Learners made notes on a prepared form of feedback for each presenter. Then, after class, learners were required to transfer their notes to a computer and submit them to the instructor via e-mail. The feedback was collated with respect to presenter and returned to each presenter with the teacher's feedback and grade.

This system (hereafter referred to as the E-mail Feedback System) was used with four different student groups. Then, out of a desire to automate some of the more menial tasks in this system (e.g., cutting and pasting feedback comments into the target presenter's feedback list), a more high-tech system was considered. One possibility was using a blogging platform (e.g., Blogger, WordPress) which have reliable commenting systems built into them. These systems , however, were not easy to adapt to a presentation-and-feedback metaphor, and could not easily provide anonymity in their default configurations and were not customizeable for feedback prompts. Another possibility was to take advantage of existing peer-feedback systems for writing (e.g., Cho

and Schunn 2007, Lin et al. 2001, Yeh et al 2008). Some of these systems were also customizeable for feedback prompts and were prepared explicitly for writing. Many of these systems are also not publicly or freely available. Some well-known Learner Management Systems (e.g., Blackboard, Moodle) have the necessary capabilities built-in or through optional plug-ins, but also have a somewhat steep learning curve for students. In short, what was desired was an easy-to-use application without too much feature overhead. Thus, Feedbacker was developed.

Feedbacker is a web-based application and feedback database which is accessed through a web browser (e.g., Internet Explorer, Safari). It involves a multi-role user design where users may have one of three roles: administrator, instructor, or student. Adminstrators have the widest set of privileges and can create courses, sections within those courses, create user accounts, and associate users with sections as instructors or students. Instructors can manage their students' presentations, give comments on their presentations, and also create questions to be used as prompts for feedback. Students can input basic data about their own presentations (e.g., title, summary) as well as give feedback on presentations by others in their enrolled section. All users access Feedback through a login system so some security level can be maintained.[2]

Figure 1. Feedbacker application window showing (left) the instructor's view of students' scheduled presentations and (right) the student's view of the main lists of their own presentations and feedbacks they must give to their peers.



Students can see feedback to them from other students about their presentations, together with aggregated scores for multiple-choice or scaled feedback question prompts. This feedback is presented anonymously, so that learners cannot know who wrote which comments or gave which scores about their presentation. Instructors, on the other hand, may see the sources of feedback and also view quick summaries of students' presentation records as well as their feedback records. In addition, the entire database can be downloaded at once by the administrator for easy back-ups.

To date, Feedbacker has been used with 14 classes at three different tertiary institutions with an average of about 10 students per class. The next section reports on a controlled test of the Feedbacker system with a subset of these students.

2 For those who are interested in the technical details, the scripts which run the Feedbacker system were written in perl with the perl-cgi module, and the Feedbacker database is XML-based, processed with XSL stylesheets using the libxslt processor.

Experiment

Design

The Feedbacker system is clearly at the high end of the technology scale while the pre-Feedbacker system, the E-mail Feedback system is at a somewhat lower technological level. It uses the technology of e-mail to transfer feedback, but uses a “brute-force” method to collate and organize the feedback. As a result, one aspect of the present study is to compare these two systems with respect to two different perspectives. The first perspective is the way that learners interact with the system as they input feedback on their peers' presentations. In advance, it is difficult to predict what difference there may be. On the one hand, the so-called “wow factor” could be operative when students use a high-technology system and that might encourage greater focus on giving more feedback. On the other hand, the repetitive, uniform look of the Feedbacker interface when filling each feedback form could be demotivating and depress the amount of feedback.

The second perspective is how the system effects different outcomes in their performance on subsequent presentations. Again, it is difficult to predict in advance what effect there might be. The “wow factor” could generate higher levels of motivation, leading to higher performance as the course progresses. Alternatively, the fact that the E-mail Feedback system more reliably returns feedback to students than the Feedbacker system (in Feedbacker, learners must access the system a second time --- after all the students have finished inputting their feedback --- in order to read all their feedback) could mean that feedback has a greater effect in the E-mail Feedback system. However, it could be that the medium is irrelevant and therefore there is no effective difference between the two systems.

In addition to these two perspectives, this research also aims to find out learners' reactions to the Feedbacker system itself with respect to such issues as how easy they found it to use, and whether they appreciated the anonymity of the system.

To sum up, then, the experiment described here addresses the following three research questions.

1. In what ways do students make use of Feedbacker compared to a less high-tech feedback system?
2. How does the effectiveness of Feedbacker compare to that of a less high-tech feedback system?
3. What are learners' reactions to Feedbacker?

Method

The experimental method was performed using one English as a foreign language course on oral presentation taught at the University of Tokyo with multiple student groups over a four-year period. The content of the course focused on studying different aspects of effective oral presentation, focusing on developing both content and delivery skills. The content remained largely the same over the four years with minor changes to suit occasional scheduling differences from term to term. Crucially, though, all iterations of the course required students to prepare and give four oral presentations in English and then give feedback to their peers afterward using the feedback prompts. Both the presentation assignments and the feedback prompts remained essentially the same across the four years. Each presentation assignment included an umbrella theme (e.g., “Problem-Solution”) and some general constraints (e.g., use slides, show a graph), but otherwise gave students freedom in choosing a topic and designing their presentations. The feedback prompts consistently included three multiple choice, scaled questions (e.g., “How was the speaker's eye contact” - “Very good”, “All right”, “Needs work”) and one free response prompt (e.g., “Write one constructive criticism to help the speaker improve their presentation skills.”).

In the first year, four student groups used the E-mail Feedback system to give feedback. In the second through fourth years, six student groups used Feedbacker to give feedback. Students were also provided with feedback on each presentation from the teacher. All of the feedback provided through either system was saved and used in the present analysis.

In order to assess how learners make use of the system, the number of feedback responses given and the word count of free response items was determined. Furthermore, to look at the effects of the feedback systems, the total of the peer feedback scores for scaled multiple-choice items was calculated with the difference between the scores for the first and last presentations representing their improvement (in their peer's eyes) over the course. Finally, in order to assess the learner's reactions to the Feedbacker system, those students were given a short survey to complete at the end of the course in Japanese. The survey consisted of several Likert-items asking students to show the strength of their agreement with various statements on a four-point scale.

Results

In total, 120 students were enrolled in the courses over the four years and participated in the experiment. Of these, six students are excluded from the study because they did not finish the course, or completed too few presentations or gave too little feedback. Of the remaining 114, 53 students used the E-mail Feedback system and 61 students used the Feedbacker system. The results and analysis below is based on only these 114 students.

On the whole, students gave peer feedback an average of 39.4 times (i.e., feedback to about 10 peers for 4 presentations). The average length of their free response feedbacks was 10.7 words, roughly 1-2 sentences. Table 1 breaks down these and other aspects of the feedback with respect to the two experimental conditions.

		E-mail Feedback	Feedbacker		
Feedback to peers	Total	330.5	542.0	F(1,111)=6.8	p<0.05
	Count	43.7	35.5	F(1,111)=14.4	p<0.001
	Average	7.6	13.5	F(1,111)=17.6	p<0.001
Feedback from peers	Total	330.7	522.0	F(1,112)=10.2	p<0.005
	Count	43.3	35.0	F(1,112)=20.7	p<0.001
	Average	7.6	13.1	F(1,112)=37.8	p<0.001
Feedback from teacher	Total	402.8	638.1	F(1,112)=190.1	p<0.001
	Count	3.8	3.9	F(1,112)=0.96	n.s.
	Average	105.0	163.6	F(1,112)=262.5	p<0.001

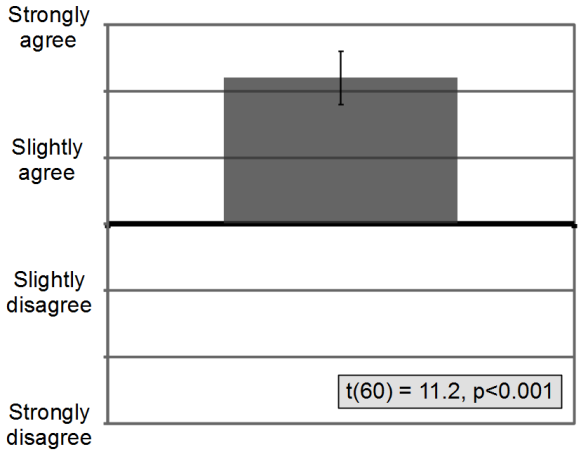
Table 1. Comparsion of mean word counts per student of various feedback types and measures between E-mail Feedback and Feedbacker experimental groups.

Learners' use of Feedbacker

As the data in Table 1 shows, students gave significantly more feedback with Feedbacker than by E-mail. This was in spite of the fact that the E-mail sections were slightly larger (13.2 students vs. 10.2 students per section). As a result, Feedbacker students gave more total feedback and more feedback per student than did E-mail students. One possible way to account for this is to presume that students attempted to compensate for the larger number of students by trying to give less feedback per student, but then over-compensated leading to a drastically reduced amount of feedback. While this is not implausible, it seems a less likely explanation than to simply say that the ease of using the Feedbacker system allowed students to write more. Further, it is not the case

that Feedbacker students simply copied and pasted the same feedback to each presenter. Students confirmed this in response to one survey question which asked them to show the strength of their agreement with the statement, "I gave unique feedback to each of my classmates." As shown in Figure 1, students quite uniformly showed strong agreement with the statement.

Figure 2. Mean degree of agreement to statement "I gave unique feedback to each of my classmates" for students in the Feedbacker experimental group (n=61). [Error bars indicate 95% confidence intervals in this and all subsequent figures.]

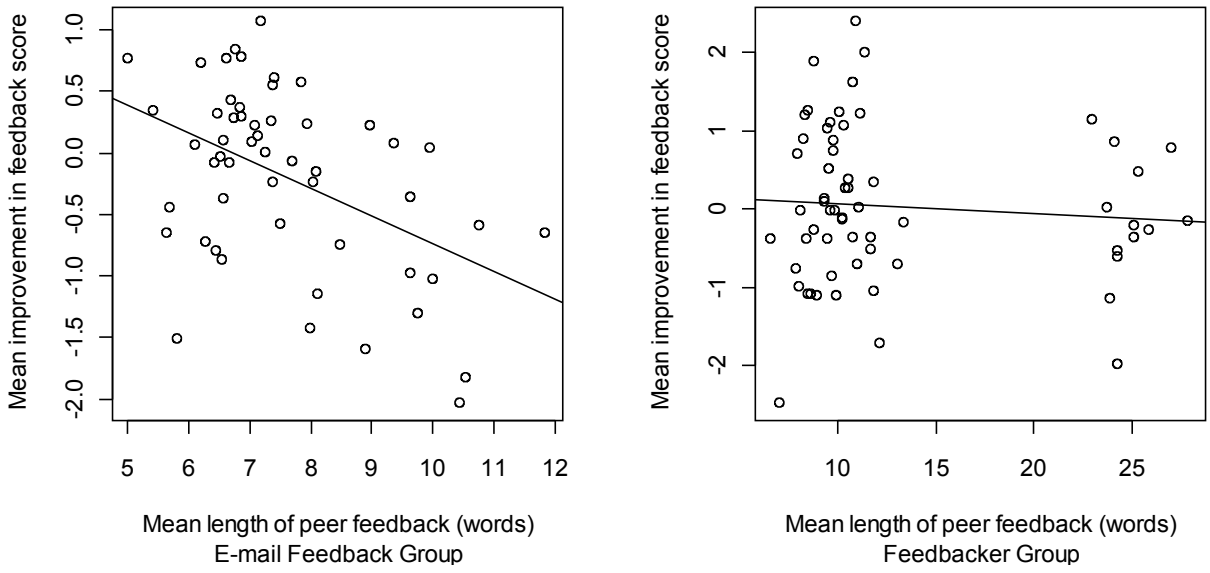


Effect of Feedbacker on learners' performance

In order to assess the effect of Feedbacker on learners' performance, the various feedback measures were compared to the improvement in their peer scores (from scaled feedback items) from the first to the final presentations. In short, the feedback measures are independent variables and the peer score difference is the dependent variable. In general, there was no significant difference between the experimental groups' mean peer scores: The E-mail Feedback group improved from 7.39 to 7.19 (out of 9 points), while the Feedbacker group improved from 7.00 to 7.03 [$F(1,112)=2.0$, n.s.]. However, when looking at the different feedback measures as input variables, several interesting trends emerge.

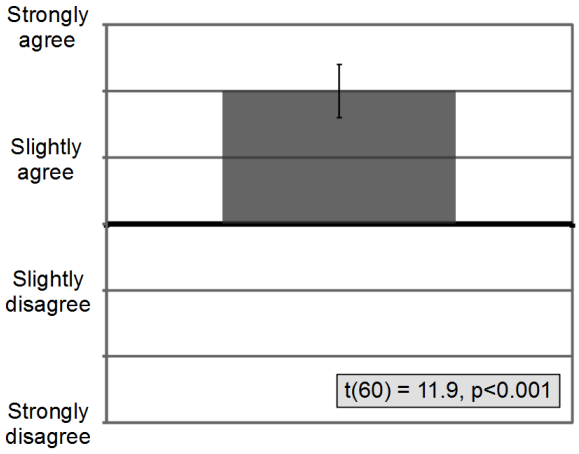
First, while there were clear differences in the amount of feedback that students gave (total, count, and average) between the two experimental groups, this did not explain any of the variance in the mean peer scores between the two groups. In short, the benefit that giving feedback has to the individual who is giving feedback (e.g., by motivating greater self-reflection) was not enhanced by the Feedbacker system. On the other hand, the amount of feedback that students received from their peers does appear to affect students' peer scores. This parallels results from Gielen, et al (2010) who also observed significant improvement based on feedback received but not based on feedback given. In the present study, the details are as follows. An analysis of variance using experimental CONDITION and mean length of peer feedback received (FROM_PEER_TOT) shows no significant main effects, but a significant interaction between two variables [$F(2, 111)=7.3$, $p<0.001$]. Interestingly, the explanation for this lies in the E-mail Feedback group where there is an inverse relationship between the mean length of feedback that students received and the change in their feedback scores, as shown in Figure 2. In other words, students who received more feedback from their peers in the E-mail Feedback condition showed less improvement (actually negative improvement).

Figure 3. Relationship between mean length of peer feedback received and the improvement in feedback scores from first to last presentations.



In contrast, in the Feedbacker group, there was no similar effect (the relationship was flat). It is somewhat difficult to explain this trend. One possibility is that students in the E-mail feedback group who received longer feedback messages were less likely to read the messages (i.e., reading was perceived as requiring too much effort and therefore was never begun) and thus never received the benefit that peer feedback offers. If so, then it's necessary to consider why students in the Feedbacker group did NOT do uniformly worse since they had a somewhat similar situation: In order to read their feedback, they had to access Feedbacker a second time---after their peers had finished uploading their feedback. Once again, perhaps the explanation lies in the "wow factor" of the high-technology. Perhaps interacting with the digital interface was itself enough of a motivation to bring students back a second time to check the feedback they had received. Indeed, students confirmed that they did read their feedback. One of the survey questions asked them to show their agreement with the statement, "I read my classmates' feedback after each presentation." As Figure 3 shows, students reliably showed strong agreement with this. Thus, the best explanation for this result seems to be that students were not motivated to read lengthy feedback in the E-mail feedback system.

Figure 4. Mean degree of agreement to statement "I read my classmates' feedback after each presentation." for students in the Feedbacker experimental group.



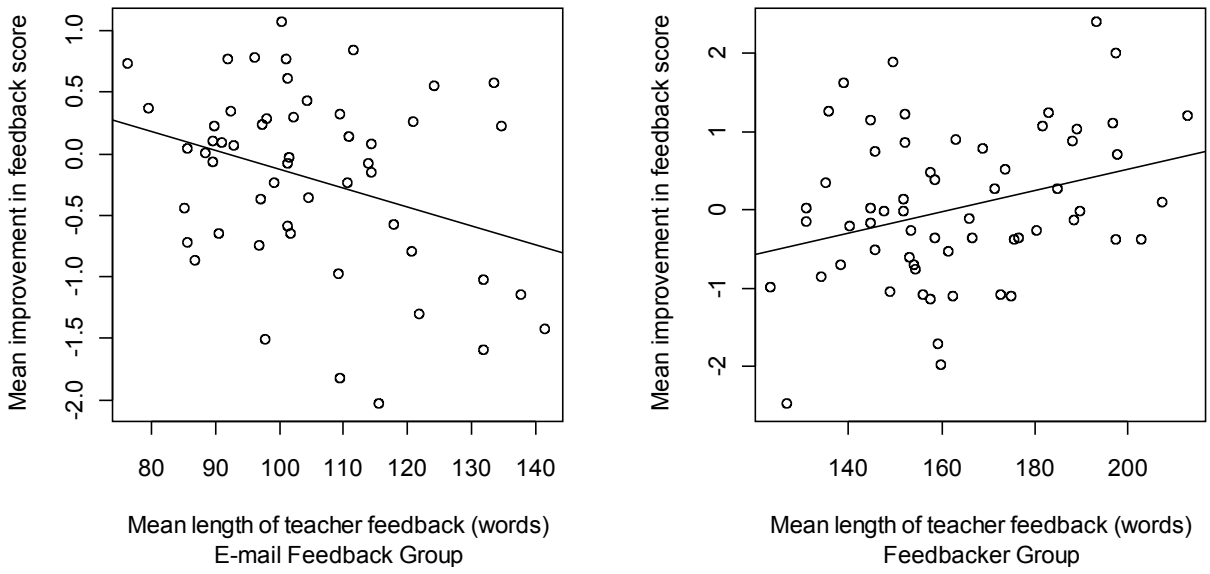
Before continuing with the data analysis, it is important to address the unusual grouping shown in the Feedbacker group in Figure 3. The group on the right-hand side that received a mean peer freedback of roughly 25 words was due to one class of students that had an unusually high number of so-called returnees (students who had lived abroad for an extended length of time with their

families). This particular group of students had a high degree of writing fluency and could construct lengthier feedback comments than the average student. As a result, the mean length of feedbacks received in that class was much higher than average. However, removing them from the current analysis does not change the overall statistical trends, and the regression line in Figure 3 changes only slightly in the positive direction. Therefore, they have not been removed from the final analysis.

Some interesting effects of Feedbacker can also be observed by looking at the teacher's feedback measures. As shown in Table 1, there was a signficant difference between the two experimental groups with respect to the mean length of feedback that each student received: students in the E-mail Feedback group received feedback with a mean length of 105.0 words while those in the Feedbacker group received feedback with a mean length of 163.6 words. This difference was not intended by the teacher (the author). A likely explanation is that the automation of much of the feedback management in the Feedbacker system allowed the teacher to spend more time on giving lengthier, more detailed feedback.

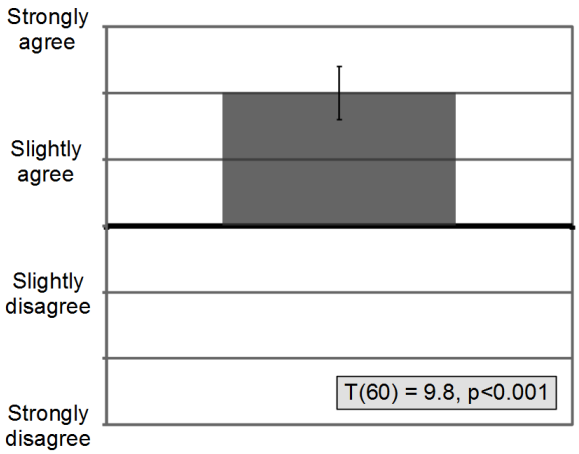
A further interesting result was found when doing an analysis of variance using experimental CONDITION and the mean amount of teacher feedback (TEACHER_AVG) as independent variables and the improvement in peer feedback scores as the dependent variables. While there were no significant main effects, there was a significant interaction between the CONDITION and TEACHER_AVG variables [$F(2, 111)=10.8$, $p<0.005$]. The difference between the two groups is illustrated in Figure 5.

Figure 5. Relationship between mean length of teacher feedback received and the improvement in feedback scores from first to last presentations.



Students in the E-mail Feedback group who received longer teacher feedback showed less improvement (in fact, negative improvement) compared to those who received shorter teacher feedback. The reason for this difference might be similar to that given for the peer feedback above: These students were less motivated to read longer feedback and may have never read it at all, thus negating whatever benefit they may have taken from it. Students in the Feedbacker group did read the teacher feedback (as they reported in the survey, and shown in Figure 6), and therefore benefited from it. Furthermore, those who received more feedback in the Feedbacker group apparently applied more of it to the preparation of their later presentations and showed greater improvement as a result.

Figure 6. Mean degree of agreement to statement “I read the teachers' feedback after each presentation.” for students in the Feedbacker experimental group.

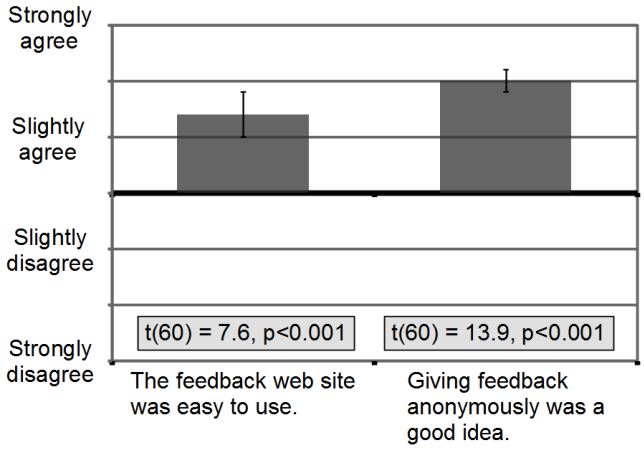


These results stand in some contrast to those of Crisp (2007) who found only limited support for student uptake of feedback received. Students in that study made only modest changes to their work (essays) based on the feedback received. In the present case, students who received more feedback, made some changes relative to their classmates who received less feedback, resulting in greater improvement in peer feedback scores. One possible explanation for the difference echoes a theme already discussed here: It is not clear whether or to what depth the students in Crisp's study read and considered the feedback they received. In the present study, on the other hand, the evidence strongly suggests that students did read the feedback, and therefore their subsequent performance was much more likely to have been influence by it.

Learners' reactions to Feedbacker

The students in the present experiment were given a survey at the end of the course to ask their opinions on a variety of issues in the course itself including Feedbacker. Their responses to two key questions are shown in Figure 7.

Figure 7. Summary of learners' responses to end-of-course survey about Feedbacker.



Students generally agreed that the Feedbacker web site was easy to use. However, in free response comments, two types of comments were repeated. First, for security reasons, the web address to access the Feedbacker system was given to students on paper in the first lesson, but no on-line link was provided (in order to keep the site hidden from search engines and from possible malicious users). However, several students noted that they could not remember the web address and wanted an on-line link to the web page. A second comment regarded the capability of editing feedback. In the original design of Feedbacker, editing one's feedback was not enabled on the reasoning that first reactions are generally more representative of people's thoughts (a common assumption in much experimentation on human behavior). Yet, several students expressed the desire to return to their

feedback afterward to make changes to it. Some reasons for this were purely practical: After submitting their feedback, they realized that they had submitted a comment about the wrong person, for example. Or, they had accidentally clicked “submit” when they were only half finished.

The second main reaction that students had was that they quite uniformly agreed that giving feedback anonymously was a good idea. They apparently felt much more comfortable about writing their feedback knowing their name would not be attached to them.

Gielen et al (2010) found that a majority of the students in their study did not want to continue doing peer feedback afterward with many commenting that they tired of the paperwork. In the present study, students were not asked a comparable question. Yet, their positive responses to the ease of use and anonymity questions were accompanied by positive responses in some free response comments on the survey. This suggests that they maintained a positive attitude overall about using Feedbacker and thus might be inclined to continue using it or similar systems in future courses.

Discussion

The discussion section begins with a summary of the main findings of this research. Students in this study who used the on-line feedback management system, Feedbacker, showed clear differences from students using a less high-tech feedback system via E-mail. Feedbacker students gave more feedback to each other and were motivated to review even lengthy feedback comments from their peers as well as from their teacher. The Feedbacker system made it easier for the teacher to give longer feedback comments to each individual student on the average, and students receiving more teacher feedback (and subsequently reading that feedback) showed higher levels of improvement in their feedback scores from their peers. Students appreciated the ease-of-use of the Feedbacker system as well as the ability to have their feedback viewed by their peers anonymously.

Based on these findings it is possible to list a number of ideas for how to improve the design of Feedbacker itself or its use in a course of study. To the extent that Feedbacker can be seen as representative of other high-technology peer feedback management systems, then these ideas may be widely applicable.

One idea is to incorporate some sort of word counting feature to force learners to input more peer feedback. Although the amount of feedback a learner receives on average is not related to their improvement, the amount they receive is. Therefore, classes should be encouraged to give more feedback to each other to raise the standard to a higher level. Indeed there are some existing systems that already incorporate this particular feature as an option (e.g., the workshop module in the Moodle learning management system). So, where possible, this feature should be enabled and taken advantage of. In the present study, the Feedbacker students received feedback with an average length of 13 words. Perhaps this would make a reasonable lower limit to start with.

Another idea is to build some mechanism into the feedback management system to ensure that students are actually reading their peers' feedback. The feedback system itself seems to motivate this intrinsically, but this might have simply been a benefit of the Feedbacker implementation and not necessarily characteristic of all high-tech peer management systems. One mechanism that might ensure that learners actually consider and internalize the feedback they get is a procedure that would require them to respond to some peer feedback. This response could even be made visible to the original feedback author in order to complete an exchange cycle. Depending on the class size, it might not be feasible for them to respond to all the feedback they receive, they might be required to respond to merely some subset. In fact, the results of the study show that the length of the feedback received is related to improvement, but the number of feedbacks given is not related. Thus, it may be better to have learners give longer feedback response, but to only a few peers. This obviously requires some management process to allocate feedback assignments in a fair way. The Feedbacker system is not currently designed to do this, but this feature may be added in without much difficulty. Some other existing feedback systems do have this feature built-in (again. Moodle's workshop

module as well as Lin et al's 2001 NetPeas system).

Another idea to discuss here is that of giving feedback on students feedback. The study here shows that receiving feedback corresponds with greater improvement in peer feedback scores. It is conveivable that if students receive feedback on their feedback, this could have a similarly positive influence on their subsequent performance. This return feedback could be as simple as the word counts discussed above, but even more sophisticated feedback responses could be automated in a feedback management system. For instance, students could be get an analysis of their feedback scores to show whether their scores are consistent or erratic compared to other students; or simply whether they are significantly tougher or easier than others (cf., Lutkus 1978, Cho and Schunn 2007). Even more sophisticated systems could do some sort of linguistic checking of the feedback to help students improve the quality of the writing. However, a very important aspect of this feedback is that over a very short period of time, a large corpus of peer feedback can assembled and the data could be mined using statistical learning methods to discover which kinds of feedback and what linguistic forms are most effective in helping students improve their language skills. The Feedbacker peer feedback corpus now consists of over 50,000 words and one of the future aims of this research is to take advantage of this corpus to help learners learn how to give better feedback.

One final point to make here is to note how Feedbacker is consistent with one of the basis tenets of computer application design. One of the design principles of Unix, the widely-used computer operating system, was stated as, “Make each program do one thing well” (McIlroy, et al 1978). This principle has been very influential in the world of computer program design to the point that Google lists a variation of it as one of their ten core principles: “It’s best to do one thing really, really well” (Google.com, “Our Philosophy”). Feedbacker is effective for arguably this reason: It is a simple web application that keeps features to a minimum and is thus easy for students to use, as they attested in the present study. Thus, while some systems exist that are far more sophisticated and may also manage other aspects of the course (e.g., grading, attendance, schedules, homework assignments, quizzes), they may be overkill for certain courses where a simpler, minimal system may be sufficient.

Conclusion

This paper has provided a set of descriptive factors that should be considered when deciding on a suitable peer feedback management system for any teaching context, followed by the introduction of a high-technology management system. In a controlled experiment, this system, Feedbacker, was compared to a lower-technology system involving written feedback submitted via E-mail. Results of the experiment show that students input more feedback per person when using Feedbacker, are more likely to read the feedback they receive via Feedbacker, and show greater improvement in their oral pesentation skills (as judged by their peers) when they receive more teacher feedback– something made more feasible by Feedbacker.

Peer feedback will no doubt continue to be an integral part of second-language teaching classrooms and curricula. It is hoped that this paper provides some explicit guidance on how to make manage the feedback process with the least effort for both students and teachers, as well as provide the basis for feedback to have optimal effectiveness at helping students improve their linguistic communication skills.

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