



Beyond Margin Notes: Utilizing Technology to Improve Feedback to Student Writers

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Introduction

Good writing skills are perpetually listed as both a failing and a necessity among prospective employers. As a result, preparing students to be good writers has become an emphasis in many engineering and technology curriculums. Research on writing repeatedly emphasizes the importance of feedback in developing student writers. Instructors therefore, must not only require appropriate writing exercises, but provide the kind of meaningful and comprehensive feedback that will improve student writing.

Traditionally, feedback is given in written form – utilizing the comments or track changes tools in word processing software, or hand written notes on hard copy texts. This article will examine the use of audio video software to provide feedback that students can both see and hear and present the results of a year and a half long study in which classes using this tool were compared to classes that utilized standard written feedback. The discussion will include student perceptions of the feedback, as well as more practical considerations for educators interested in utilizing this concept.

Literature Review:

The research on writing in general is substantial and diverse. Because of the nature of this particular study, this literature review will focus specifically on research that details the role and importance of feedback in improving writing, and why writing is a critical skill for those entering the engineering and technology fields.

The concept of workforce communication skills is emphasized as a critical need in engineering and technology. Norback & Hardin (2005) note that engineers spend a good deal of time writing on the job, and that writing skill is often a component in promotion decisions.¹ Markel (2013) concurs, noting that writing is considered a “threshold skill”² that employers consider when hiring and promoting. Craig et al (2008) argued that 21st century engineers need to be skilled communicators not only to meet ABET accreditation standards but to meet the needs of “professional practice”³.

The unique writing requirements for those entering the technology fields have been acknowledged and led to the development of discipline specific writing instruction designed to teach those students how to develop products such as specifications, reports and instructional documentation⁴. The discipline of technical writing itself was created in engineering and technology curricula specifically to teach students the particular nuances of professionally communicating technical information on the job⁵. The idea that feedback is integral to student writing feeds off the overall learning principle that “practice, coupled with targeted feedback is central to learning”⁶. The idea is that feedback allows students to alter their future behavior and thus perfect their skill; what Ambrose et al refer to as “formative feedback”⁶.

It’s important to note that the process of commenting on student writing and the question of how much feedback actually improves writing is still an active area of research, and thus open to much debate. Scholars have opined that early studies of writing feedback may have been flawed in design⁷. Subsequent studies have indicated that instructor feedback, along with the opportunity to revise writing before it becomes a final, graded product, does lead to better student writing^{7,8}. Other texts indicate that students feel the same. In 1990, Harvard University Professor Richard Light conducted a study that focused on what undergraduate courses were considered ‘effective’ by undergraduate students. Light found that students preferred (and did better in) courses in which the instructor provided rapid, frequent feedback on work – which naturally lends itself to courses that are writing intensive⁹. Light’s work has been built upon by The Harvard Study of Undergraduate Writing, which studied the writing of 400 undergraduate students from 1997 to 2001. The study mirrors and expands Light’s assumptions. According to the Harvard Study of Undergraduate Writing, students utilize feedback to not only improve writing, but to discern instructor expectations, understand the content and interpret their own performance¹⁰.

Scholar Nancy Sommers has also studied and written about the qualitative benefits of instructor comments – the more or less “soft” aspects of feedback. Providing comments, Sommers suggests, makes audience real for students, and reminds them that their writing must communicate to a reader other than themselves¹¹. Sommers goes on to suggest that reminding students that there is someone reading their work allows students to become “thoughtful readers”¹¹ themselves and contributes to both critical thinking and improved learning. Light and Sommers’ assumptions about the importance of feedback to student performance has become an accepted foundation of writing pedagogy.

Student interpretation of instructor comments is also an area of study. Thomas Gee noted that students often assign a tone to instructor comments that the instructor did not intend. Gee suggests that students often take comments such as “awkward” or “poorly written” personally¹². Sommers notes that as a result, instructors must be cognizant of the tone of their comments: “To develop authority as writers, students need guidance and specific advice, always phrased in an encouraging tone”¹¹. The study of student writing is evolving, and any scholar teaching a writing intensive class would find the literature on writing interesting and helpful. The broad overview

presented here is meant to provide a foundation for this particular study on the use of technology to provide feedback to student writers, and to reiterate the importance of writing to engineering and technology professionals.

The Study

This study was designed to examine how audio-video feedback using a tool called Tegrity could be used to provide more complete feedback to student writers. The most common form of feedback is written (or typed, if using a word-processing program) comments in margins or within the body of a student paper¹³. Researchers have also utilized various types of technology to provide feedback, most notably audio or video recordings in which the instructor ‘reads’ a student paper and provides oral commentary that is then sent to the student via various technologies, such as podcasts¹³. Strictly oral feedback, while allowing an instructor’s true tone to show, does not allow the student to ‘see’ what the instructor is referring to in the actual writing assignment, unless the student has a copy of the paper in front of him or her while listening to the audio feedback. Even then, the oral recording could become cumbersome and confusing if the student loses his or her place, or if the instructor moves ahead in the document without saying so out loud. This study was designed to combine written comments with oral feedback so that students could ‘see’ their paper on screen, along with seeing the instructor and hearing the instructor’s feedback.

The Tegrity audio-video feedback tool was deployed for the first time in Spring, 2013 in one face to face section of an upper level, writing intensive technical writing course designed for technology majors at a four year university. The study continued in the Fall, 2013, Spring 2014 and Fall 2014 semesters. In all four semesters, one section of the technical writing course was selected to receive feedback via Tegrity, and the other sections received standard written feedback. The course enrollment is capped at 24 students. It is a required course for all students in computer science and technology programs, as well as being an acceptable equivalent for business writing for students in other majors. The tool itself, Tegrity, was chosen because it is compatible with the university course management system Blackboard, and because producing videos via the tool is simpler and less time consuming than with other tools because there is no File Transfer Protocol (FTP) involved, and the time it takes for the videos to ‘render’ is minimal. The tool works with a standard web-cam and microphone, and anything on the user’s desktop computer can be pulled up and shown in the recording. The tool also allows the instructor to show themselves in a corner of the video.

The Course

Each week during the semester, students write a paper that applies the lessons learned that week. Students write four ‘foundational’ assignments in the first month of the course that focus on defining and recognizing technical writing, analyzing audience, writing in a readable style and research. The remainder of the course focuses on writing specific workplace documents: a graphics/page design assignment, a business letter, a technical description, a resume and cover letter, a memo with embedded instructions, a proposal and a technical report. The students turn in each of these documents as an assignment. The instructor grades the assignment, gives feedback, and returns the graded assignment with the feedback to the student within a week of submission. At the end of the semester, the student revises the eight workplace documents based on the instructor feedback, and compiles the documents into a portfolio, which is then submitted as the final project. The documents the students write throughout the semester and the final portfolio constitute all of the graded work for the course – there are no standard tests or quizzes.

Prior to the Spring of 2013, feedback was provided to students who submitted papers digitally using the ‘highlight’ and ‘track changes’ functions of a word processing software. Students that turned in hard copy assignments received written comments directly on the paper. As noted, students received graded work back within a week so that they could utilize the feedback on subsequent assignments. For this study, one section of the course in Spring 2013, Fall 2013, Spring 2014 and Fall 2014 was selected randomly to receive feedback via a recorded video that showed the instructor in one corner of the video, and the student’s paper in another, larger window. The instructor used the highlight and track changes function to mark the paper while narrating the changes being made orally. When the video was done, the instructor uploaded it to a special section of the course site, where each student could only see his or her own work. The videos were also completed within one week of the assignment being submitted, and remained on the student’s particular area of the course site for the entire semester. Figure 1 is a ‘screen grab’ of what the videos looked like, although for FERPA reasons, the document being shown in Figure 1 is not actual student work.

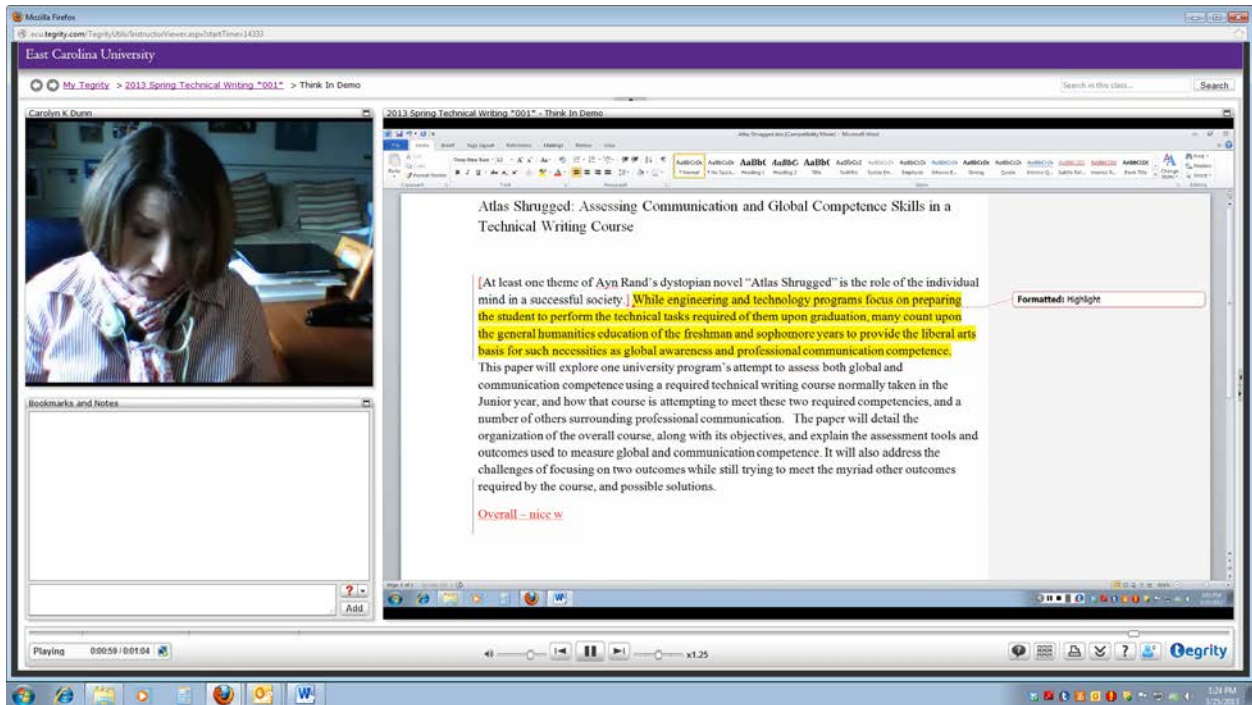


Figure 1: Screen Capture Sample of Tegrity Feedback Video

The remaining sections of the same technical writing course (six sections in all over the course of the study), taught by the same instructor, received typical written feedback with no audio-video augmentation. It should be noted that the feedback given to both the Tegrity and standard sections is fairly lengthy. Instead of one word notes such as ‘wordy,’ for instance, the sentence is actually edited and rewritten with an explanation of why. This kind of feedback ensures that students understand instructor comments and also shows them how to edit needless words from a sentence; something they clearly needed help to do if the sentence was wordy in the first place. This kind of sentence level issue is addressed in the feedback, in addition to ‘larger’ concerns such as coherence, structure, lack of evidence or detail and organization.

Technical Discussion

The tool itself, Tegrity, is relatively easy to use. From a production standpoint, the instructor, wearing a microphone and using a webcam, opens the Tegrity window, clicks on an icon to start the video recording and from there can pull up and record anything that appears on the instructor’s desktop computer – in this case, the assignment being reviewed. The instructor can then begin pointing out particular problems with the assignment using the track changes and highlight functions of a word processing software to make the changes, while also narrating the changes and making suggestions orally. The oral narration allows more involved discussion of

the ‘why’ for the changes – drawing on what was discussed in class, for instance. Thus, the student can physically see what is being changed on the assignment, in addition to hearing the instructor narrative and seeing the instructor’s facial expression. Once the instructor is finished, he or she clicks on another icon to stop the recording. Another icon click automatically uploads the finished recording.

One of the primary concerns initially was the security and confidentiality of individual videos. Each video had to be viewed by only the student in question. To ensure this, once the video is finished and uploaded, the instructor accesses a control panel and turns ownership of the video over to the student, and marks the video itself as never publishable. This places the completed video into the individual student’s secure area, where it can only be viewed by that student. The videos also remain in the instructor’s control panel. As more videos are added, the old videos stay in the student’s secure area, so that at the end of the semester, the student has all of the videos produced over the course of the semester for review before the portfolio is due.

For the first three semesters of the study, the tool worked in this way without a flaw. However, in the Fall of 2014, the instructor noticed that student videos were randomly switching ownership when they were moved to the student recording section of Tegrity. This flaw would have allowed students other than the “owner” to see the video. The flaw was reported to the vendor and the recordings were suspended until it was repaired. Late in the same semester, the flaw reappeared. It was again reported to the vendor and the recordings were stopped. Because of the recurring flaw, this particular software is not currently being used again. A switch to a new technology that also integrates with the university course management system will be adopted in the future.

Initially, the instructor had a ‘learning curve’ to master both creating the videos and depositing them in the student’s secure area. After that, however, the process was fairly streamlined. The instructor started by opening the assignment and reviewing it briefly to see what aspects needed to be addressed and explained in the video. Then the instructor started the recording and created the narrated video. Depending upon the length of the assignment and the number of issues that needed to be addressed, videos ranged from two minutes to twelve minutes in length. Once uploaded and turned over to the student, the student could access the course website to view the video, download it to his or her computer and/or access it on a mobile device or tablet via an app. The videos could be paused, speeded up or slowed down just as most online/computer videos. At the beginning of each semester, the instructor showed the class how feedback would be delivered and how to access the Tegrity videos. Each week, the instructor would remind students about using Tegrity to view feedback, and asked if anyone was having problems with the tool. A few students across the four semesters of the study had an initial issue learning how to access the tool for the first time, but beyond that none of the students ever expressed having any problems utilizing the tool.

On the last day of class, students in the Tegrity section and the standard sections of the course were given a questionnaire to fill out about their experience in the class. Completion of the questionnaire was voluntary and anonymous; once students were done, they placed it face down in a folder near the door to the classroom and left. The instructor did not handle the questionnaires until the class was finished. A number of the questions on the survey dealt with non-feedback related items such as how they felt about the course assignments and the class attendance policy. Several questions focused exclusively on feedback given in the class. The questions given to the initial group of students in Spring 2013 are listed in Table 1.

Table 1: Questions Regarding Feedback in Tegrity and Standard Courses, Spring 2013

Class	Survey question
Standard Feedback	<ol style="list-style-type: none"> 1. Did you feel the level of feedback you received from your instructor was adequate? If not, what would you have liked to see in terms of feedback on your papers?
Tegrity Feedback	<ol style="list-style-type: none"> 1. Did you feel the level of feedback you received from your instructor was adequate? If not, what would you have liked to see in terms of feedback on your papers? 2. You were given feedback via Tegrity. Did you like the audio video feedback better than standard written feedback? Why? If you didn't like it, why? 3. How did you use the Tegrity feedback? (circle all that apply) <ol style="list-style-type: none"> a. I listened/watched the video, then revised my paper. b. I revised my paper while listening/watching the video. c. I listened/watched the video on each assignment as soon as it was posted to Tegrity d. I listened/watched the videos at the end of the semester before turning in my portfolio

After the Spring, 2013 deployment of the study, an additional question was added to the survey for both the Tegrity and Standard written feedback sections of the course. This additional question was designed to find out how the students in both the Tegrity and Standard feedback sections interpreted and understood the feedback they received; the intent was to discern if there was a difference between the Tegrity and Standard written feedback sections in this respect. This question was utilized in the Fall, 2013, Spring 2014 and Fall 2014 semesters. Forty four students in the Tegrity feedback sections and 66 students in the Standard Written feedback sections answered this particular question. It was phrased as follows:

Answer the following question(s) about feedback and circle all that apply:

- a. I understood the feedback my instructor gave me.
- b. The feedback I received conveyed enthusiasm and helpfulness on the part of my instructor.
- c. The tone of the feedback I received was positive.
- d. The feedback I received was instructive and made my writing better.

Over the course of four semesters, four sections of the technical writing course utilized Tegrity feedback. These sections enrolled 93 students. Of those 93 students in the Tegrity feedback sections of the course, 60 students filled out the questionnaire in varying degrees. Of the 140 students in the six standard feedback sections, 89 students filled out the questionnaire. The results of the completed questionnaires are detailed below.

Results

Both the Tegrity and Standard feedback sections of the course were asked whether or not they felt the feedback from the instructor was adequate, and if not, why. Eighty one of the 89 respondents in the standard feedback sections responded that they felt the feedback was adequate. Fifty seven of the 60 respondents in the Tegrity feedback section felt the feedback was adequate, with the three remaining respondents declining to answer the question.

There is a difference between the two outcomes, but not a substantial one: roughly 95% of the Tegrity feedback students felt the feedback was adequate as opposed to 91% of the Standard written feedback students. This could indicate that the student expectation regarding the level of feedback was met overall, regardless of the delivery method.

Students in the Tegrity feedback section of the course were asked additional questions about their experience with feedback. First, students were asked if they liked receiving feedback via Tegrity better than standard written feedback. Forty three of the 60 (roughly 71%) respondents wrote that they preferred feedback via Tegrity over written feedback. Nine (roughly 15%) respondents wrote that they preferred to receive feedback in written form. Four respondents noted that both forms of feedback were acceptable. The final four respondents did not answer this particular question in the survey.

The students were also asked to explain their preference for the Tegrity feedback. Once the surveys were gathered, each 'reason' for the Tegrity preference was noted in a list. Once that list was compiled, it was studied to determine if any of the answers could be grouped together

under an overarching description. Those explanations fell into three primary categories: respondents felt the Tegrity feedback was better understood, more detailed, and more personal. Respondents felt the feedback was better understood and mentioned that reason more than any other when expressing a preference for the audio video feedback; better understanding of feedback was mentioned 15 times in the survey results. The next most commonly stated reason for preferring the Tegrity feedback was that students felt it was more detailed and comprehensive; that was mentioned 13 times. The third most often cited reason for preferring the Tegrity feedback (mentioned 7 times) was that it was more personal.

The final question asked of only the students in the Tegrity feedback section of the course was designed to find out how the students utilized the feedback. Students were asked how they used the Tegrity feedback and were given four choices to choose from. Students were told to choose as many of the four that applied. The choices were:

- a) I listened/watched the video, then revised my paper.
- b) I revised my paper while listening/watching the video.
- c) I listened/watched the video on each assignment as soon as it was posted to tegrity
- d) I listened/watched the videos at the end of the semester before turning in my portfolio

Responses a and b were meant to discern how students used the feedback while revising assignments for the final portfolio. Responses c and d were designed to determine when the students viewed the feedback – as soon as the Tegrity videos were posted, or at the end of the semester before turning in the final portfolio. Because students were permitted to circle any and all responses they felt applied, the results will be detailed by noting how many respondents selected each answer.

In terms of how the students used the feedback while revising, twenty respondents noted that they watched and listened to the video and then revised their paper, as opposed to eleven who revised their work while listening to/watching the video. Seven respondents did both – revised after watching and while watching. In terms of when students used the feedback, 22 of the respondents noted that they listened to/watched the videos as soon as they were posted throughout the semester, while 21 noted that they listened to/watched the video at the end of the semester before turning in the final portfolio. Nine respondents noted that they listened to/watched the videos both as soon as they were posted and at the end of the semester. This indicates that while (a very small) majority of the respondents were watching/listening to the feedback throughout the semester, an almost equal number waited until the end of the semester to view the feedback. This is a concern because the feedback is meant to have a cumulative effect in terms of helping a student become a better writer, and students that wait until the end of

the semester to view and therefore implement early feedback miss the opportunity to work that feedback into subsequent assignments.

The additional question designed to determine how students in both the Tegrity and standard feedback sections interpreted and understood the feedback they received was added to the study after Spring 2013 and was utilized in the Fall, 2013, Spring 2014 and Fall 2014 semesters. Forty Four students in the Tegrity feedback sections and 66 students in the standard written feedback sections answered this particular question. As noted, it was phrased as follows:

Answer the following question(s) about feedback and circle all that apply:

- a. I understood the feedback my instructor gave me.
- b. The feedback I received conveyed enthusiasm and helpfulness on the part of my instructor.
- c. The tone of the feedback I received was positive.
- d. The feedback I received was instructive and made my writing better.

Table 2 shows a side by side comparison of the respondents answers to this question.

Table 2: Comparison of Responses For Tegrity & Standard Feedback Courses

Question	Tegrity Feedback (44 respondents)	Standard Feedback (66 respondents)
a. I understood the feedback my instructor gave me.	43 (97%)	59 (89%)
b. The feedback I received conveyed enthusiasm and helpfulness on the part of my instructor.	37 (84%)	56 (84%)
c. The tone of the feedback I received was positive.	41 (93%)	54 (81%)
d. The feedback I received was instructive and made me a better writer.	40 (90%)	59 (89%)

Table two highlights some interesting results. While a larger majority of the Tegrity respondents felt they understood the feedback from the instructor, and an even larger number of the Tegrity respondents felt their feedback was positive, the respondents in both groups were almost identically matched in terms of whether or not they felt the feedback conveyed enthusiasm and helpfulness on the part of the instructor, and whether the feedback they received made their writing better. This would indicate that while the audio-video feedback increased comprehension of the feedback, the end result, creating better writers, is the same regardless of the type of feedback received. In addition, it is interesting that a larger majority of the Tegrity respondents viewed the feedback as positive, while at the same time feeling it conveyed

enthusiasm and helpfulness on exactly the same level as the standard feedback respondents. One would think that if the Tegrity respondents viewed the feedback as positive in greater numbers, they might also view it as helpful and enthusiastically delivered.

While the sample size in this study is not particularly large, it does lend itself to some observations. First, the majority of students, in both the Tegrity (95%) and standard written feedback sections (91%) felt the feedback was adequate regardless of how it was delivered. Likewise, the students in both study groups felt the feedback made their writing better; 90% in the Tegrity feedback sections and 89% in the standard written feedback sections. This would indicate that overall, regardless of how it was delivered, students felt the feedback was adequate and that it improved their writing. The majority of the respondents in the Tegrity feedback section of the course noted that they preferred the Tegrity feedback to written feedback because it was better understood, more detailed and personal. Students in the Tegrity feedback sections also indicated in higher numbers that the feedback was positive. The largest concern from the data is the indication that close to half of students in the Tegrity feedback sections waited until the end of the semester to view the feedback, which is problematic in the sense that as the literature review indicated, regular feedback is necessary to improve writing. That issue will need to be addressed to ensure students are getting the most from the feedback they receive.

Conclusion

From a technical standpoint, the error with the technology in the last semester of the study could have been potentially harmful had it not been caught; a move to a new software will require a new ‘learning curve’ on the part of the instructor. Additionally, while a majority of students liked the audio video feedback better, the statistics do not indicate that it necessarily translated into better writing, any more than standard feedback does.

However, the study does suggest that audio/video feedback of student writing is worth studying, and that students at least feel it benefits them for a variety of reasons. If, as noted in the literature review, understanding instructor feedback is an issue, then this form of feedback seems to ameliorate that problem, while creating what the student sees as a more “personal” relationship with the instructor. Mining that relationship could also be a way to increase the number of students who view the audio video feedback quickly and regularly. In the future, students will be required to respond to their feedback weekly, which would allow students, as Sommers notes, to “participate in a dialogue about their writing”¹¹.

While this particular study focused on feedback in a writing intensive course, the reality is this concept could be used to give specialized feedback to any student in any course. Engineering and technology faculty could use this format to give feedback on tests and other

kinds of projects that do not involve writing. Any item one can pull up and view on a desktop computer can be shown to the student via this technology; the possibilities to utilize this type of feedback are fairly unlimited. However, while this type of feedback seems to benefit students, it is important to note that it does not save the instructor any time in terms of grading work. It is, as always, time consuming to grade student writing, regardless of the method; instructors should not adopt this concept thinking that it will save time. However, instructors could explore the idea of creating universal videos that all students into the course can view. If students are all working on the same type of document or the same type of project, for instance, an instructor could create a video showing a 'good' example that would help students as they work on their own assignment. This would allow students to see a representation of "good work" without requiring that individual videos be created for each student. It would also be interesting to discover if this type of feedback would help build community in online courses and strengthen the connection between students at a distance and the instructor.

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