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Preparing Professional Writers via Technologically Enhanced Feedback: Results of a One Year Study

Dr. Carolyn Kusbit Dunn

ABSTRACT

Both the academic research and general news media have recognized and emphasized the importance of so called 'soft skills' in gaining employment. One soft skill that appears on list after list, year after year, is the ability to communicate effectively both orally and in writing. Preparing industrial technology students to meet this particular need for the future workforce naturally means emphasizing writing skills in the college curriculum. Research on writing repeatedly emphasizes the importance of feedback in developing student writers. Industrial Technology instructors therefore, must not only require appropriate writing exercises, but provide the kind of meaningful and comprehensive feedback that will improve student writing. This paper examines the role of feedback in developing better writers, and discusses the method, results and conclusions of a year long study using audio-video technology to enhance feedback in a university technical writing course.

Introduction

For a number of years both the academic research and general news media have recognized and emphasized the importance of so-called 'soft skills' in gaining employment. One soft skill that appears on list after list, year after year, is the ability to communicate effectively both orally and in writing (Association of Technology, Management and Applied Engineering, 2013, National Association of Colleges and Employers, 2013, Robles, 2012). Preparing industrial technology students to meet this particular need for the future workforce naturally means emphasizing writing skills in the college curriculum. However, requiring students to write is not necessarily equivalent to making students good writers. Research on writing repeatedly emphasizes the importance of feedback in developing student writers (Light, 1990, Ambrose et al, 2010, Knoblauch & Brannon, 2006, Hillock, 2006). The longtime Harvard Study of Undergraduate Writing indicates that students view feedback on their writing as "central to their learning experience" (Walk, 2000). Industrial Technology instructors therefore, must not only require appropriate writing exercises, but provide the kind of meaningful and comprehensive feedback that will improve student writing. As anyone who teaches writing

intensive classes will tell you, it takes a considerable amount of time and labor to respond to student writing. As a result, there are many different techniques instructors use to give feedback that is comprehensive for the student, yet efficient for the instructor. This paper examines the role of feedback in developing better writers, and discusses the method, results and conclusions of a one year long study using audio-video technology to enhance feedback in a university technical writing course embedded in a technology curriculum.

Literature Review

While many instructors are experts with advanced degrees in their particular area of study, they may not be experts in evaluating writing specifically. The literature review will therefore focus on the role and importance of feedback in improving student writing and also address why writing is important to those entering the industrial technology fields.

Gokhale (1997) noted that “an integral part of most technology based jobs involve oral and written communication with vendors, customers, managers, engineers, technologists and technicians” (Gokhale, 1997, p. 11) and that, conversely, industrial technology curricula often do not teach students how to do these things. (Gokhale, 1997). Writing to communicate on the job involves paying close attention to the intended audience and the format of the document in addition to the concepts presented (Gokhale, 1997), which can often be a different exercise than writing undertaken in basic composition courses taught outside the industrial technology curricula.

The concept of workforce communication skills is emphasized as a critical need elsewhere as well, with Norback & Hardin (2005) noting that engineers spend a good deal of time writing on the job, and that writing skill is often a component in promotion decisions (Norback & Hardin, 2005). Markel (2013) concurs, noting that writing is considered a “threshold skill” (Markel, 2013, p. 5) 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” (Craig et al, 2008, p. 281).

The unique writing requirements for those entering the technology fields have been acknowledged (Boyd & Hassett, 2000) 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 documentation (Boyd & Hassett, 2000). 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 job (Connors, 2004).

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” (Ambrose et al, 2010, p. 125). 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” (Ambrose et al, 2010, p. 137).

The process of providing feedback on student writing – and its subsequent effectiveness – has been much debated and questioned. The title of the introduction to the book *Key Works on Teacher Response* best expresses it: “The Emperor (Still) Has No Clothes – Revisiting the Myth of Improvement” (Straub, 2006, p. 1). Among writing scholars, the question over how best to give student feedback and how much that feedback actually improves student writing is still open to exploration and research. Scholars have opined that early studies of writing feedback may have been flawed in design (Knoblauch & Brannon, 2006). 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 (Knoblauch & Brannon, 2006, Hillocks, 2006). 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 is possible in writing intensive courses where students write regularly (Light, 1990). The Harvard Study of Undergraduate Writing, which studied the writing of 400 undergraduate students from 1997 to 2001, built upon Light’s work. The study mirrors and expands Light’s assumptions, concluding that students utilize feedback to not only improve writing, but to discern instructor expectations, understand the content and interpret their own performance (Walk, 2000).

Sommers (2013) has also studied and written about the qualitative benefits of instructor comments – the more or less “soft” aspects of feedback. Providing comments, Sommers posits, makes audience real for students, and reminds them that their writing must communicate to a reader other than themselves. (Sommers, 2013). Sommers goes on to suggest that reminding students that there is someone reading their work allows students to become “thoughtful readers” (Sommers, 2013, p.xi) themselves and contributes to both critical thinking and improved learning.

How students interpret comments from instructors is also an avenue of study. Gee (2006) noted that students often assign a tone to instructor comments that the instructor did not intend. Gee (2006) suggests that students often take comments such as “awkward” or “poorly written” personally (Gee, 2006, p. 38). Sommers (2013) 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” (Sommers, 2013, p. 6).

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 questions this study was designed to answer are:

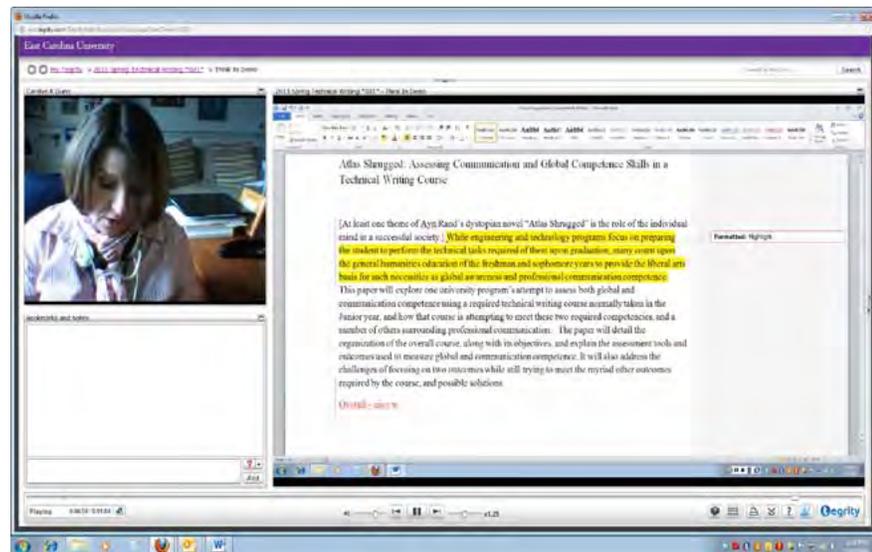
1. Do students prefer receiving audio-video feedback as opposed to written only feedback? If so, Why?
2. How did students use the audio-video feedback to revise their writing?
3. How did students interpret the audio-video feedback, and how does that compare to how students interpret strictly written feedback?

Initially, the study focused on questions one and two; question three was added after the first semester of the study.

The most common form of feedback does not deploy technology; it is written (or typed, if using a word-processing program) comments in margins or within the body of a student paper (Moore & Filling, 2012). 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 podcasts (Moore & Filling, 2012). 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. For this study, one section of an upper level Technical Writing course in a technology curriculum at a four year institution was selected randomly in Spring 2013, Fall 2013 and Spring 2014 to receive audio-video feedback via a tool called Tegrity. The recorded video 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 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 (five sections in the year-long 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.

On the last day of class, students in the Tegrity section and the standard sections of the course were given a questionnaire to complete 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	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	<p>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?</p> <p>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?</p> <p>3. How did you use the Tegrity feedback? (circle all that apply)</p> <ul 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 and Spring 2014 semesters. Thirty three students in the Tegrity feedback sections and 52 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.

To summarize, over the course of three semesters, three sections of the technical writing course utilized Tegrity feedback. These sections enrolled 70 students. Of those 70 students in the Tegrity feedback sections of the course, 49 students filled out the questionnaire in varying degrees. Of the 117 students in the five standard feedback sections, 75 students filled out the questionnaire. below.

Course Background

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 within a technology curriculum at a four year university. The designation 'writing intensive' is part of a university wide writing across the curriculum program in which students must take 12 hours of courses designated as writing intensive. Three of those hours must be taken in the student's discipline. In all three semesters, one section of the technical writing course was randomly 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, industrial distribution and logistics, industrial technology, design and information and computer technology programs, as well as being an acceptable equivalent for business writing for students in majors outside the technology field.

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. With the exception of the graphics/page design assignment, students choose a topic for the workplace documents that pertains to their particular field; for instance, an industrial distribution and logistics major may write about robotic warehousing systems for his or her technical report and information and computer technology students may write about software as a service models for organizations.

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. All students received graded work back within a week so that they could utilize the feedback on subsequent assignments.

Technical Background

Tegrity was chosen because it is compatible with and embedded in 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. Also, the time it takes for the videos to 'render' is minimal. The tool works with a standard webcam and microphone, and anything on the user's desktop computer can be pulled up and shown in the recording. This makes the tool inexpensive to use, and easily accessible. The tool also allows the instructor's image to be shown in a corner of the video.

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 only that student can view it. 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.

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 three 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.

Results and Findings

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 it was not adequate. Sixty-nine of the 75 respondents in the standard feedback sections responded that they felt the feedback was adequate. Forty-eight of the 49 respondents in the Tegrity feedback section felt the feedback was adequate, with the lone remaining respondent declining to answer the question.

There is a difference between the two outcomes, but not a substantial one: roughly 97% of the Tegrity feedback students felt the feedback was adequate as opposed to 92% of the Standard written feedback students. A further Chi-square analysis on the data from this particular question revealed that there is no significant difference in whether or not the standard and Tegrity feedback groups differed on whether they were satisfied or not. ($p=0.16$).

The six standard written feedback students who did not feel the feedback was adequate, noted that they wanted "more" feedback, preferred personal conferences with the instructor, and expressed ambivalence toward the feedback, saying "it was fair" and it was adequate "to a degree." These students might have been better served with the audio video feedback, as it does provide a more personal experience. Despite that, more than 90% of the respondents in both groups felt the feedback they received was adequate regardless of how it was delivered. This would indicate that the student expectation regarding the level of feedback was met overall.

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. Table 2 illustrates the responses to this question.

TABLE (2): PREFERENCE FOR TEGRITY VERSUS STANDARD FEEDBACK

Question (49 respondents)	Preferred Tegrity Feedback	Preferred Written Feedback	No preference/ did not answer
You were given feedback via Tegrity. Did you like the audio video feedback better than standard written feedback?	36 (73%)	7 (14%)	6 (12%)

Thirty-six of the 49 (roughly 73%) respondents wrote that they preferred feedback via Tegrity to written feedback. Seven (roughly 14%) respondents wrote that they preferred to receive feedback in written form. Four respondents noted that both forms of feedback were acceptable. The final two 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 14 times. This was the most cited reason for preferring the audio-video feedback. The next most commonly stated reason for preferring the Tegrity feedback (mentioned 9 times) was that students felt it was more detailed and comprehensive. The third most often cited reason for preferring the Tegrity feedback (mentioned 7 times) was that it was more personal.

This final reason is interesting in the sense that when the study was first launched in Spring, 2013 the personal nature of the feedback was not mentioned in student responses. After the first semester of the study, the primary reasons for preference of Tegrity feedback were split evenly in three ways, with one third of the respondents feeling it was better understood, one third feeling it was more detailed, and another third feeling it was more convenient. None of the initial respondents noted that it felt more personal. As the study moved into its second and third semesters, convenience practically disappeared from the list of reasons students preferred the Tegrity feedback, with only one other student mentioning it in the subsequent two semesters of the study. But the sense that the Tegrity feedback was more personal emerged as the third most commonly cited reason for preferring in the two subsequent semesters of

the study. There is no obvious answer as to why convenience seemed to be less important as the study went on. It could be that students in a highly technology mediated world take convenience for granted or that they didn't think the feedback was in fact convenient. It could be that the later groups of students valued a personal experience more than convenience and thus mentioned it more frequently. Perhaps in the future, an additional question could be added to the questionnaire asking students specifically to rank their reasons for preferring the audio-video feedback; that is the only way to discern for certain why this shift occurred.

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. Table 3 shows the results of this particular question.

TABLE (3): SUMMARY OF RESULTS FOR USE OF TEGRITY FEEDBACK

Question: How did you use the Tegrity feedback? (circle all that apply)	Respondents
I listened/watched the video, then revised my paper.	15
I revised my paper while listening/watching the video.	9
I listened/watched the video, then revised my paper. AND I revised my paper while listening/watching the video.	6
I listened/watched the video on each assignment as soon as it was posted to Tegrity.	20
I listened/watched the videos at the end of the semester before turning in my portfolio.	18
I listened/watched the video on each assignment as soon as it was posted to Tegrity. AND I listened/watched the videos at the end of the semester before turning in my portfolio.	6

In terms of how the students used the feedback while revising, fifteen respondents noted that they watched and listened to the video and then revised their paper, as opposed to nine that revised their work while listening to/watching the video. Six respondents did both – revised after watching and while watching. In terms of when students used the feedback, twenty of the respondents noted that they listened to/watched the videos as soon as they were posted throughout the semester, while eighteen noted that they listened to/watched the video at the end of the semester before turning in the final portfolio.

Six 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 the 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 designed to help 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. This will be further addressed in the conclusion.

The additional question designed to determine how students in both the Tegrity and standard feedback sections interpreted and understood the feedback they received yielded interesting results. As noted previously, this question was added to the study after Spring 2013 and was utilized in the Fall 2013 and Spring 2014 semesters. Thirty-three students in the Tegrity feedback sections and 52 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 4 summarizes the results from this question.

TABLE (4): COMPARISON OF PERCEPTION OF FEEDBACK BETWEEN TEGRITY & STANDARD COURSES

Question	Tegrity Feedback (33 respondents)	Standard Feedback (52 respondents)
a. I understood the feedback my instructor gave me.	32 (96%)	45 (86%)
b. The feedback I received conveyed enthusiasm and helpfulness on the part of my instructor.	30 (90%)	42 (80%)
c. The tone of the feedback I received was positive.	32 (96%)	40 (76%)
d. The feedback I received was instructive and made me a better writer.	31 (93%)	45(86%)

In the Tegrity sections of the courses surveyed, 32 of the 33 respondents or roughly 96%, noted they understood the feedback (choice a.) and that the tone of the feedback they received was positive (choice c.) Thirty of the 33 respondents (90%) felt the feedback conveyed enthusiasm and helpfulness (choice b.), and 31 respondents or 93% felt the feedback made their writing better (choice d.). The percentage of respondents choosing affirmatively was over 90% for every potential answer of the question, with selection a. I understood the feedback and c. The tone of the feedback I received was positive topping out at 96%.

In the non-Tegrity sections, none of the potential answers garnered more than 86% agreement. Forty five of the 52 respondents felt they understood the feedback (choice c.) and that it helped their writing (choice d). Less of the respondents felt the feedback conveyed enthusiasm and helpfulness (choice b.): forty two of the 52 respondents or 80% selected that option. The lowest rating fell to selection c: “the tone of the feedback I received was positive.” Forty of the 52 respondents, or 76%, chose this option.

The marked contrast between the students who received audio video feedback and the students who received standard written feedback is worth noting in the last question. The question itself was designed to discover how students perceived and interpreted the feedback they received, and whether there was a difference between the Tegrity and standard written feedback – and clearly there is, in this case. Whereas 96% of the Tegrity students perceived the tone of the feedback as positive, only 76% of the standard written feedback Tegrity students felt the same. Likewise, there is a 10% difference between the sections in terms of the helpfulness and enthusiasm the feedback conveyed. In the Tegrity sections, 90% of students felt the feedback conveyed helpfulness and enthusiasm. In the standard written feedback sections, 80% of respondents felt that way. That 10% difference is also present when examining whether students understood the feedback they received; 96% of the Tegrity feedback respondents felt they did, as opposed to 86% in the standard written feedback sections. In terms of whether the students felt the feedback made their writing better, the gap is smaller, but still there. Ninety-three percent of the Tegrity feedback respondents felt that the feedback made their writing better while 86% of the standard written feedback respondents felt the same. The fact that the audio video feedback allows students to both see and hear the instructor, including facial expressions and tone of voice may have been a factor in the disparity and may also have contributed to the feeling for many of the Tegrity feedback students that the audio video feedback was more personal.

Several findings emerge from this project. First, the majority of students, in both the Tegrity (97%) and standard written feedback sections (92%) 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; 93% in the Tegrity feedback sections and 86% 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. However, the respondents in the standard written feedback sections did not have the opportunity to choose which kind of feedback they would receive, and if the responses from the Tegrity feedback surveys are any indication, the standard written feedback students might have felt differently had they been offered the choice.

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 helpful, enthusiastic and positive. The one 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 prevented them from utilizing the regular feedback identified by the literature as necessary to improve writing (Ambrose et al, 2010, Light, 1990, Sommers, 2013). That issue will need to be addressed to ensure students are getting the most from the feedback they receive.

Conclusion and Future Research

This particular study lasted for three semesters, and the data gathered were not statistically large enough to convey strong generalizations about the Tegrity methodology. The first limitation of this study is that the way the data is currently collected does not lend itself to specific statistical analysis. This could be addressed by altering the questionnaire currently given to students. Now that primary reasons for preferring the audio-video feedback have been identified, those preferences could be listed in individual questions with a Likert scale rating system. The same thing could be done for the questions dealing with how students used the feedback, and how students interpreted the tone of the feedback. The second limitation of the study is that it surveys one course taught by the same instructor. It would be interesting, and also lend credence to the results, if this study were expanded to include Technical Writing courses taught by multiple instructors. That might make the results more generalizable.

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, (Gee, 2006, Sommers, 2013) 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 personal relationship could also be a way to increase the number of students who view the audio video feedback quickly and regularly. The fact that almost half the students surveyed did not regularly review their feedback needs to be addressed in a future study. One way to do that could be to require students to respond to their feedback after each assignment. This type of assignment creates, as Sommers notes, a way for students to learn from and implement feedback and actively “participate in a dialogue about their writing” (Sommers, 2013, p.9).

Essentially, after the student is given the audio video feedback, he or she would be asked to write a brief paper that explains what the student learned from the feedback, and how he or she might use it to revise the document. This allows the student to fully think about his or her writing and the feedback and develop concrete ways to implement the changes the feedback suggests. From a practical standpoint, this would also force the student to watch the feedback soon after it is posted.

Another potential area of study being examined is how to blend universal videos created for view by all students into the course. The reality is that the audio/video feedback did not save the instructor time in terms of grading papers, which may discourage some instructors from utilizing it. However, creating general 'sample' videos for student viewing is currently being researched. For instance, if students are asked to rewrite the same poorly written document, or create graphics based on the same set of statistics, the instructor could either complete the assignment along with the students and post one universal video, or ask permission from a student who did the assignment well to use his or her work as the basis for that universal video.

Utilizing previous student writing would allow students to see a representation of "good work" without requiring that individual videos be created for each student. That idea could also be applied across a wide swath of technology related courses where different kinds of writing are done. . In a lab class that requires students to write a lab report or a project management class that requires students to write progress and project reports, instructors could create videos that show students how to write those documents in a way that is accepted and expected in the discipline. This concept could also be used in math based classes, with instructors creating a video showing students how to correctly complete a problem. The reality is that any class, regardless of content, could utilize this idea to show students examples of good work. The benefit is that the instructor could create one video, and that students could look at it as many times, and at any speed that they chose to. A student having problems with the assignment could review the video in the privacy of their own space as many times as necessary until they understand the issue at hand. They could also use that video in multiple ways; to understand what they did wrong and to improve how they perform in the future. This is not an idea that is limited to Technical Writing courses. 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.

Technology mediates our lives in many ways, and the lives of our students. What this study does overall is suggest that utilizing technology can help us better serve those students and better prepare them for the types of writing they will be doing in the workplace. As instructors, we adopt tools that serve those purposes while allowing us to manage the load of teaching and grading – the copy machine and the typewriter were once at the forefront of technology; think about how those tools were eventually deployed in classrooms. This particular study will continue to refine the idea and the methodology of gathering results, but overall, the concept could be deployed immediately in a variety of classroom and online settings to help students achieve success and courses achieve their objectives.

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