

# Hidden Disruptions: Technology and Technological Literacy as Influences on Professional Writing Student Teams

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**Publication History:**

*The Writing Instructor*, May 2010

## Hidden Disruptions: Technology and Technological Literacy as Influences on Professional Writing Student Teams

When professional writing students collaborate, even if they do not use specific software designed for electronic collaboration, they use technology as part of their writing and collaborating processes: writing outlines or drafts, building Gantt or PERT charts to manage longer projects, searching for information on library databases or on the Internet, creating visuals for reports or web pages, sharing documents or information via email, or responding to one another's documents, for example. Although such activities require technology, instruction in such technologies is generally not part of the already full professional writing curriculum. Instead, students learn technologies on their own, from one another, or via individual help during an instructor's office hours (Allen & Benninghoff, 2004).

The students using those technologies come to professional writing courses, and to the collaborative teams within those courses, with varying levels a *technological literacy*, a term that refers, not just to functional competence with computers, but also to practices and values involved in reading, writing, and communicating in electronic spaces (Hawisher, Selfe, Moraski, & Pearson, 2004). Each student, in other words, is in the midst of an evolving relationship with technology. That relationship's history, its duration, its health, and its dysfunction will be different for each student. Students bring those differences in technological literacy to their collaborative teams. This article reports on a study designed to explore whether and in what ways individual students' technological literacies might impact collaborative teams. For the collaborative team discussed in this article, technological literacy—specifically, limited repertoires for solving technical problems, clashes between document management strategies, and lack of critical literacy—did influence, sometimes disrupt, the team's writing processes and products. Because the students had been developing their technological literacy long before the course began, because differences in and influences of technological literacy are often subtle, and because most group work takes place without the instructor's direct supervision, the influences of technological literacy on this team's collaboration were generally hidden from their instructor.

## The Study

The participants in this study, the "Candy Team," were students enrolled in a business writing course at a large, Midwestern university. This upper-division service course met in a computer lab, was taught by a graduate teaching assistant pursuing a degree in rhetoric and composition, and included students from a wide variety of majors. A major component of the course was a collaborative consulting project, the Corporate Web Site Simulation (Porter, Sullivan, & Johnson-Eilola, 2006). For this eight-week assignment, students joined a collaborative team that chose a

real-world business client with a question about the Internet, such as whether the company needed a web site or how to improve an existing web site. The Candy Team chose a local candy store as their client and researched whether or not the client would benefit from a web page. The team completed a report cycle, including proposal, planning report, and progress report, which culminated in a recommendation report delivered to both the course instructor and the client. The Candy Team, then, was using technology to write about technology.

The Candy Team was a team of four women, all white: Mary, a twenty year-old sophomore business major; Allison, a nineteen year-old sophomore computer technology major; Sarah, a twenty-one year old junior majoring in youth, adult, & family studies; and Ellen, a twenty-two year old senior animal science major. Although their technological literacies varied, each student was from and in a technology-rich environment: each, for example, owned her own computer at the time of the study, had received computer training at school, and had had a computer at home for at least the last few years of high school.

According to Patricia Sullivan and James E. Porter (1997), "all forms of data collection are static snapshots of what is fundamentally a fluid set of events" (p. 5). Tape recordings of team meetings may be more fluid than most data, but they are still an incomplete portrayal of a complex event. With those limitations in mind, I sought to use a variety of methods in order to collect data from a multiple sources. I worked toward triangulation by collecting data via the following sources: physical observations of all in-class team meetings; tape recordings of all team meetings, whether in-class or out-of-class, recorded by the participants; copies of team email messages, notes, drafts, and documents; student-completed questionnaires concerning demographic data, computer use, and proficiencies with certain software; and exit interviews.

On a certain level, my data analysis began while I was observing the student teams as I made choices about what to notice, what to include in my field notes, or what questions to ask in the interviews. This was, of course, influenced by my prior reading in the field. I continued my analysis by examining the documents the team provided and transcribing the tapes from team meetings. Like Susan M. Katz (2002), I found that the transcription process led to "vivid recall [which] was invaluable for synthesizing information and 'seeing' categories during analysis" (p. 31). I then coded the transcripts and documents for discussions or interactions related to technological literacy and other emerging themes, developed a technological literacy profile for each participant, and analyzed each team's collaborative process, attempting to examine technological literacy in action.

## **Findings and Discussion**

Each member of the Candy Team entered the project with a unique technological literacy; that is her own history with technology; skills with technology; attitudes toward and values concerning technology; and contextualized literacy practices using technology (Hawisher & Selfe, 2002; Hawisher, Selfe, Guo, & Liu, 2006; Hawisher et al., 2004; Selber, 2004a; Selfe, 1999, 2001; Selfe & Hawisher, 2004). These individual technological literacies shaped the team's collaboration in at least three ways. First, team members' limited problem-solving repertoires disrupted the documents they drafted. Second, the conflict between their individual document management strategies disrupted their meetings and altered their writing processes and relationship. Third, their lack of critical technological literacy shaped their research and their argument.

### **Limited Problem-Solving Repertoires Disrupted Documents**

When a student uses technology, he or she is likely to face at least minor problems, particularly when undertaking new tasks or working in new situations, and the students completing the Corporate Web project faced both. Whether and how each person resolves such problems is a dimension of her functional technological literacy (Selber, 2004a). On the Candy Team, limitations in the team members' functional technological literacy, specifically participants' limited problem-solving repertoires, forced them into document choices they might not otherwise have made.

Mary, a member of the Candy Team, used technology in a fairly limited fashion. For her, a computer served almost as a glorified telephone or typewriter: she used the technology primarily to send email or instant messages to her friends and family, or to type papers. I use the word *type* here deliberately. During my observation, Mary used few word processing features other than "cut," "paste," "thesaurus," and "print preview." Mary typed papers; she did not design documents. Mary's problem-solving repertoire for these technologies was particularly limited. During the study, she faced a number of problems with MICROSOFT WORD's auto-formatting function (a function that, admittedly, can be challenging even for writers with more expertise). When faced with unwanted formatting, Mary generally tried to move beyond it by hitting the key

or to undo it using WORD's "Undo Typing" button or the key. Occasionally, Mary simply capitulated to the auto-formatting, as when she chose to leave a widowed table row in a document because it was "too hard to fix." During one meeting, she resorted to begging the computer to cooperate, repeating "please let this work, please let this work."

Mary's limited experience with technology and her limited problem-solving repertoire altered documents that Mary and her teammates, most of whom had problem-solving repertoires not much more advanced than Mary's, created together. For example, Mary and her team coauthored a document that used MICROSOFT WORD's comments feature. After adding a balloon comment to the end of the memo's first paragraph, Mary, at the keyboard for this particular assignment, could not move the cursor past the comment to continue typing the memo. Mary tried the key repeatedly, which simply inserted additional blank lines above the comment. Her teammate Sarah suggested the key, which erased the comment, leading Mary back to the "Undo Typing" button on her toolbar to restore the comment. Eventually, Mary was able to move the cursor past the comment to begin drafting the next paragraph, but the comment was now linked to a blank line instead of to the end of the paragraph where Mary had originally placed it. At Sarah's comment, "Oh, well, it separates it," the team moved on to draft the remainder of their memo, leaving the balloon comment in its unwanted location, separating, disrupting, their document (See Figure 1).



Figure 1: The Candy Team's memo with balloon comment attached to blank line.

Not only did MICROSOFT WORD, through auto-formatting or through its programming of its balloon comments features, alter their documents in unwanted ways, but Mary and her teammates were powerless to override such alterations. Without sufficient problem-solving repertoires, the writers could not deploy the balloon comment within the document as they wanted to. Had one team member possessed more experience with MICROSOFT WORD's advanced features or a more robust problem-solving repertoire, the team's document might have fulfilled their goals, and the comment might have been attached to the location they intended. However, even if a single competent team member had mitigated the disruption to this particular document, such a victory would not necessarily have armed her teammates with improved problem-solving strategies for the future. Johanna Wolfe and Kara Poe Alexander (2005) found that in mixed-gendered groups little peer-to-peer computer instruction takes place. Wolfe and Alexander did hold out some hope for single-gendered female teams like Mary's, and my study of this team indicates that there was, indeed, some peer-to-peer technology teaching. However, such teaching was generally related to solving a specific, situated, relatively minor problem with a document. Students with limited problem-solving repertoires, then, would likely have found themselves at the mercy of the software's programming again soon, leaving them with additional disruptions to their documents.

## Document Management Strategies Disrupted Collaboration

Writing in new contexts, like co-authoring teams, may complicate students' relationships with technology, particularly if those relationships are already tenuous. Seemingly simple processes become more complex. Strategies for working with technology, particularly less sophisticated strategies, can fail in new circumstances. Problems may arise where least expected. These can act as disruptive forces on the collaborative process.

All of the members of the Candy Team but Allison, who described herself as a “die-hard technology person,” had relatively limited technological facility.[1] When the team met at Sarah’s apartment to compile their final report, for which each member had written a portion, no team member had had enough experience working with technology, or at least working with technology in teams, to suggest a protocol for sharing documents. Ellen brought her portion of the report in a format inaccessible to Sarah’s computer. Allison’s work was stored on her campus server space (her “H Drive”), which she was unable to access from Sarah’s computer. Ultimately, the team relocated their meeting to a campus computer lab in order to have access to all team members’ materials.

Ellen had previously moved with relative ease between campus computer labs and her home computer. Allison had remotely accessed her H Drive many times and from many locations in the past. Writing with others, however, often means writing with different technologies and in different contexts. In those new contexts, the students’ document management strategies, strategies that had worked for them individually, failed. That failure altered (a) their meeting, (b) their writing and revising processes, (c) their relationships with each other, and (d) their relationships with me and contributions to my research.

Their meeting was physically and temporally disrupted as they moved from apartment to campus lab and spent an hour trying to access files and finding a new location. The conditions in their new context, specifically the lab’s eleven o’clock p.m. closing time, influenced their meeting as well. Shortly before the lab closed, Sarah and Mary, who had been compiling and editing the final report, faced formatting problems. Faced with a deadline imposed by the looming closing time at the lab, Sarah chose to save the document with the formatting problem, and she corrected it alone at home later that night.

The team’s intended writing and revising processes were altered as well. Rather than compiling and revising the document together on one computer in Sarah’s apartment, they worked in a lab, using up to three computers at one time: Mary and Sarah compiled and edited the final report; Ellen used MICROSOFT POWERPOINT to create the team’s presentation, due later that week; Allison edited one of her graphs in MICROSOFT EXCEL, then helped Ellen with the presentation. While such a division of labor proved to be fairly efficient and might seem unsurprising for a student writing team, this particular team’s collaborative model up to this point had been unusually integrated (Killingsworth & Jones, 1989): they frequently co-drafted, sometimes with every member of the team contributing to a single sentence. Their decision to work together on the single computer at Sarah’s apartment indicates that the team had expected this meeting to be similarly integrated. The team’s revising process also may have been altered by the clash of document management strategies and the time spent moving to the lab: they worked until minutes before the lab closed simply to compile and format the document, leaving them without time to revise collaboratively. Two team members later revised the document individually, again a less integrated process than one would have expected from this team.

The document management difficulties this team faced influenced their relationships as well. Although Allison (the “die-hard technology person”) was the most technologically sophisticated member of this team, the physical layout of the computer lab in which the class met and Allison’s position within that physical space had hindered Allison’s interaction with technology during most team meetings. When the team met together during class, Allison generally rolled her chair away from her computer near the back of the lab to the front row of the lab where her teammates sat. Allison, then, was the only team member not logged in to a lab computer when the team met together during class. Although she had mentioned to her teammates that she had chosen computers for her major, Allison had had little opportunity to position herself as the team computer expert up to this point. When Allison attempted to access her H Drive from Sarah’s apartment, something none of her teammates knew how to do and Mary did not even know was possible, the others were duly impressed. Later, when she successfully used FTP to access her H Drive from the lab computer where a teammate had logged in, her teammates again praised her skill. In their exit interviews, two of her teammates mentioned Allison’s superior technical skills, and Mary credited Allison with teaching her how to remotely access her own H Drive. Allison’s teammates, then, noticed and appreciated her technical knowledge at least in part because of events on the evening they tried unsuccessfully to access her H Drive from Sarah’s computer. Additionally, Allison’s eagerness to access her H Drive appears to have built cohesion among the team members. The H Drive became a running joke throughout the evening, with Sarah joking that they “decided to get rid of H Drives—they’re not working,” and Allison teasing that Sarah was “just jealous of the H Drive.”

In addition to altering the Candy Team’s opinions of and relationships with one another, the team’s document management challenges and resultant walk to campus affected my data and my relationship with the team. As they walked together from the apartment to the campus lab, the team, who recorded their meetings for my research, turned on my tape recorder again and

began recording, this time addressing me directly. They told me what landmarks they passed, thanked me for some fudge I had made them,[2] and told me whether and with whom they had shared the fudge. They continued to address me directly via the tapes for the remainder of the three-hour meeting, giving me information about their context, providing updates on their progress and their computer problems, asking me for advice, even crediting me in absentia with special powers that had solved their computer problems. Their comments gave me richer information about their work together in that meeting and, because they gave us something to joke about when they handed me four tapes for one evening's meeting, helped us build more cohesive researcher/participant relationships.

## **Lack of Critical Literacy Influenced Research and Argument**

Many discussions of technological literacy have valued a critical technological literacy which recognizes that technologies are not transparent or neutral and which does not automatically accept society's views of technology (Cook, 2002; Duffelmeyer, 2000, 2002; Feenberg, 1995; Selber, 2004a). The members of the Candy Team did not evidence a critical view of technology. Instead, the participants embraced what Haas (1999) called the "*straightforward progress model*, a new-is-better view in which new technologies are more advanced and therefore more efficient, more powerful, or both" (p. 210, emphasis original). The attitude that the participants seemed to take toward technology included confidence that technology would bring progress and solve problems. The team evidenced, in other words, a hegemonic view of technology, accepting the dominant cultural message that computers are a natural, unproblematic, and perhaps inevitable form of progress (Duffelmeyer, 2000, 2002; Selfer, 1999; Takayoshi, 1996). Specifically, the members of the Candy Team assumed that a web page would, almost single-handedly, cause the client's business to grow. This assumption influenced the team's research for and recommendation to their client.

From the first memo they wrote about their project, the Candy Team evidenced the assumption that the Internet would inevitably cause the client's business to grow: "Despite [the client's] disagreement, we believe that his business could benefit from having an Internet presence. He believes that his business is self advertising and does not have a desire to increase his business." At the beginning of the project, the client told the team that he did not believe he needed a web site. The team understood the client's objection to be because he valued relationships with his customers and feared he would lose that personal touch if the business grew.[3] The team assumed that a website would almost certainly cause the client's business to grow, perhaps to the point of expanding to a second location.

The assumption that web pages necessarily grow small businesses influenced the Candy Team's research process. The team did extensive field research: they interviewed the client and toured his candy-making facilities, surveyed the client's customers and university students, searched the Internet for evidence of the client and its competitors, and surveyed the client's competitors about web pages, regular customers, and effects of business growth on personal relationships with clients. However, the team never researched whether or how web pages help small businesses grow. They had, in fact, some evidence that a web page would not help this business grow: the client's business had been featured on a web page once before, but the client had not found it helpful. Accepting society's assumptions about the power of the Internet and technology as forward progress, the team researched around their research question (Should the client have a web page?), but never researched the question itself.

The Candy Team ultimately recommended against a web page for this client. They stated their reasoning most clearly in their final oral presentation, which concluded with the following syllogism:

- [The client] wishes to remain a small business
- An Internet presence would increase business especially among campus community
- We do not recommend a website for [the client]

Because the Candy Team did not question or research their assumption that the Internet necessarily increases business, the syllogism on which their recommendation was built contained a logical flaw, an unproven second premise.

## **Implications for Pedagogy and Research**

Although the members of the Candy Team were from and in relatively technology-rich environments, and although they were working with the same technologies they had used throughout college, the technological literacies of the students in this upper-division business writing course did influence their collaboration, disrupting it, altering it in more or less significant ways that were largely hidden to their instructor. First, the limited problem-solving repertoires of

the Candy Team members, particularly Mary, disrupted the documents they created, forcing them to accept unwanted auto-formatting and leaving them powerless to make certain desired changes to their documents. Second, the clash between team members' document management strategies, strategies that had worked for each individually, temporally and physically disrupted their team meeting, altering the meeting, their relationships, and my data. Third, the Candy Team members' lack of critical technological literacy affected the work they did for their client, shaping their research and their recommendations, both of which were based on an unquestioned assumption that web sites will cause small businesses to grow.

My argument here is not that technology and technological literacy disrupt collaborative teams by forcing their course away from what might otherwise have been a smooth, ideal path to collaborative success. I'm not pining away for what might have been if only these students had been more technologically savvy. Instead, my argument is that technology, even the technology our students use regularly, and our students' technological literacies alter their writing processes and products, particularly when those students collaborate, in ways that may be hidden to instructors. My findings concerning the Candy Team have implications for pedagogy and for future research.

## **Implications for Pedagogy**

The influence of technological literacy on the Candy Team's writing process and written products was largely hidden from their instructor. The Candy Team's instructor did not see them struggle with and capitulate to WORD's formatting. She did not see them move their meeting from one location to another in order to access each team member's documents. She did not see, at least until she received their final report, that the research the Candy Team was so diligently conducting never questioned whether a web site would cause the client's business to grow. This was not the result of instructor negligence: an instructor cannot be present at every team meeting any more than she can be present at every stage of her individual students' writing processes. Still, my research suggests that we make some changes in what we notice and what we teach in the professional writing course.

## **Things to notice**

My research suggests that professional writing instructors attend closely to individual students' technological literacy and to technological literacy's influence on co-authoring teams.

Professional writing instructors cannot assume a level playing field when it comes to students' technological literacy, even when those students are upper-division students from and in technology-rich environments. In terms of functional technological literacy with the fairly common software they used for their project, the members of the Candy Team differed considerably in their skills, and, despite their previous experience with the software, faced a surprising number of difficulties with the technologies they used for their project. One must assume that the differences and difficulties would be greater for students who also had to overcome access challenges (Kirtley, 2005; Moran, 1999). Assuming that our students possess a certain level of functional technological literacy leaves them at the mercy of their existing skills, their assumptions, and their software.

Based on this study, instructors should be attuned to technological literacy and how it may influence collaborative processes and products of student teams. When students bring, as they must, their differing technological literacies onto a collaborative team, technology use becomes more complex. The Candy Team was not working with new, cutting-edge technology as they sent email, conducted Internet research, and created documents, graphs, and charts. They worked with more mundane technologies, technologies that have become standard on home computers and in campus computer labs across the country, technologies that risk becoming invisible because they have become commonplace, at least for those in technology-rich environments. However, Candy Team members' technological literacy influenced the way the team collaborated and the documents they produced. Andrew Feenberg states that "technology influences people's behavior" (in Zachry, 2009). I would extend the statement: technological *literacy* influences *teams'* behaviors.

## **Things to teach**

Because our courses are already full to overflowing with substantive material, I hesitate to suggest any additional burden for professional writing instructors. I, too, am disheartened by the important things I have to cut or cut short each term. Nevertheless, my study of the Candy Team forces me to suggest that we consider ways to address a few issues that aren't generally part of most professional writing curricula: technology, collaborating with technology, and critical technological literacy.

The Candy Team's difficulties suggest that professional writing instructors should be prepared to provide some training with the technology students will use to complete their work for the course. I am certainly not suggesting that professional writing courses become "MICROSOFT WORD 101." However, instructors should be able to arm students with problem-solving heuristics for the specific software required and to provide individual assistance, perhaps by occasionally holding office hours in a computer lab. I suggest that such training be done prior to or separate from the collaborative project, rather than leaving the students to develop strategies as they work together, since the collaborative project itself is not necessarily the most conducive spot for students to develop technology skills (Wolfe & Alexander, 2005). By providing even minimal assistance with technology, we can help our students become empowered to make their own document choices, rather than letting the software make those choices for them.

Gretchen N. Vik (2001), in "Doing More to Teach Teamwork than Telling Students to Sink or Swim," advocated specifically training student teams in teamwork, and I agree that such training is a necessary and valuable component of any collaborative assignment. I suggest, additionally, that professional writing instructors train students in strategies for collaborating with the technologies within their specific educational contexts, attending particularly to ways collaborating with technology differs from writing individually with technology. Given the technology conditions on a specific campus, for example, instructors can supply students with document management strategies, including strategies for formatting, naming, sharing, responding to, editing, and combining documents.

In addition to equipping students to use and collaborate with technology, professional writing instructors should seek to help students develop critical technological literacy. The students on the Candy Team had not developed a critical view of technology before the project and did not do so during the project. The Candy Team accepted a forward-progress model of technology and failed to question dominant views of technology, which influenced the research they conducted and the recommendations they made for their client. If, as others have suggested, critical literacy is an important component of technological literacy (Breuch, 2002; Cook, 2002; Duffelmeyer, 2000, 2002; Selber, 2004b; Selfe, 1999), then professional writing instructors need to address those issues with their students, teaching them not only to use technology but also to interrogate it. Some scholars have suggested curricula or classroom activities to help students develop critical technological literacy (Cook, 2002; Duffelmeyer, 2002; Selber, 2004b). Such work offers a firm foundation, although any such pedagogy would need to be adapted to the specific local conditions of a particular institution and its students.

## **Implications for Research**

This study suggests several promising implications for further research: new directions for research on technological literacy, more research on what happens within collaborative teams, and additional research focused on common computer technologies.

We should continue the important research on technological literacy. I would urge, however, that our work incorporate a new direction, observing more technological literacy in action and examining technological literacy's development and its effects in varying contexts. In terms of tagmemic rhetoric (Young, Becker, & Pike, 1970), our field has examined technological literacy as a particle, defining it, for example, and exploring its complexity. We have also examined technological literacy as a wave, interviewing technology users in order to learn about their technological histories, technological literacy practices, and the material conditions surrounding them. I suggest, though, that we continue to explore technological literacy's wave by exploring its movement forward in time. What kinds of experiences, classroom or otherwise, can encourage specific technological literacy practices, for example, or foster more critical technological literacy? In addition, I suggest additional research on technological literacy (and on collaboration, for that matter) as part of a field. If technological literacy impacts collaboration, we need to learn more about why and how that happens, how collaboration can impact technological literacy, and how technological literacy impacts other aspects of writing processes and products.

I would also suggest more research on collaborative teams, concentrating particularly on the experiences of the individual students. Recent work on collaboration indicates a promising move in that direction (Ingram & Parker, 2002a, 2002b; Kirtley, 2005; Vik, 2001; Wolfe & Alexander, 2005), but there is more to learn about what happens to students when they work together. If collaboration is to be a permanent fixture in professional writing pedagogies, as it seems to be, we must continue to interrogate collaborative pedagogy. Part of that interrogation should include laying groundwork through studying the uses and goals that instructors have for collaborative assignments. Then, armed with a better understanding of pedagogical goals for collaboration, we can examine whether and in what ways our use of collaboration fulfills those goals, where it misses the mark(s), and how to improve collaboration, not just as a classroom practice but as a

pedagogy.

The field of professional writing has a strong body of work interrogating cutting-edge technologies and their potential for pedagogy. Emerging technologies certainly provide fertile ground for research (Jackson, 2007). I believe this work is valuable, although I would argue that attention exclusively to such technologies may be dangerous. Moran (1999) critiques the field's attention to such technologies as "unwitting complicity" in the relationship between wealth and access (p. 218), and I agree with his call for more attention to issues of access. Additionally, my findings indicate that even those technologies that have become common for many college students and instructors do still influence the literacy practices of individuals and teams. I believe that our field should continue to interrogate these more mundane technologies, particularly those that are pervasive—invisible and ever-present strike me as a dangerous combination. Such technologies risk seeming transparent to computer users; they should not become transparent to researchers as well. Feenberg (1995) offered examples of users who exerted their influence to change technology. In order to change technologies, or to empower our students to do so, we must be able to see them.

## Notes

[1] At the beginning of the study, the participants self-evaluated their proficiencies with thirteen types of software using a Likert-type scale (1=Poor; 2=Fair; 3=Good; 4=Very Good; 5=Excellent). The mean scores for the members of this team were: Sarah, 2.8; Mary, 3.3; Ellen, 3.4; and Allison 3.9. The figures are not based on skills tests and are not a transparent measure of actual competence. Ellen, for example, probably had higher computer skills than she gave herself credit for, but she valued being outdoors and viewed technology as a hindrance to that value. The perceived skills figures do address, however, the participants' perceived proficiencies with particular software, as well as their comfort with technology, practices concerning technology, confidence in their own technological skill, and perhaps (as in Ellen's case) the value they place on those skills.

[2] In an effort to build more reciprocal relationships with my participants, I baked for them, bringing cookies, fudge, or other baked goods to them several times during the data collection process.

[3] As I did not interview the client, I cannot confirm whether the team's understanding was accurate or not. Their discussions about the client interview indicated that the client did not want to expand, but not that he connected expansion with a website.

## Works Cited

- Allen, Nancy, & Benninghoff, Steven T. (2004). Tpc program snapshots: Developing curricula and addressing challenges. *Technical Communication Quarterly*, 13, 157-185.
- Breuch, Lee-Ann Kastman. (2002). Thinking critically about technological literacy: Developing a framework to guide computer pedagogy in technical communication. *Technical Communication Quarterly*, 11, 267-288.
- Cook, Kelli Cargile. (2002). Layered literacies: A theoretical frame for technical communication pedagogy. *Technical Communication Quarterly*, 11, 5-29.
- Duffelmeyer, Barbara Blakely. (2000). Critical computer literacy: Computers in first-year composition as topic and environment. *Computers and Composition*, 17, 289-307.
- Duffelmeyer, Barbara Blakely. (2002). Critical work in first-year composition: Computers, pedagogy, and research. *Pedagogy*, 2, 357-374.
- Feenberg, Andrew. (1995). *Alternative modernity: The technical turn in philosophy and social theory*. Berkeley: U of California P.
- Haas, Christina. (1999). On the relationship between old and new technologies. *Computers and Composition*, 16, 209-228.
- Hawisher, Gail E., & Selfe, Cynthia L. (2002). Collaborative configurations: Researching the literacies of technology. *Kairos*, 7.
- Hawisher, Gail E., Selfe, Cynthia L., Guo, Yi-Huey, & Liu, Lu. (2006). Globalization and agency: Designing and redesigning the literacies of cyberspace. *College English*, 68, 619-636.
- Hawisher, Gail E., Selfe, Cynthia L., Moraski, Brittney, & Pearson, Melissa. (2004). Becoming

literate in the information age: Cultural ecologies and the literacies of technology. *College Composition and Communication*, 55, 642-692.

Ingram, Sandra, & Parker, Anne. (2002a). Gender and modes of collaboration in an engineering classroom: A profile of two women on student teams. *Journal of Business and Technical Communication*, 16, 33-68.

Ingram, Sandra, & Parker, Anne. (2002b). The influence of gender on collaborative projects in an engineering classroom. *IEEE Transactions on Professional Communication*, 45, 7-20.

Jackson, Michele H. (2007). Should emerging technologies change business communication scholarship? *Journal of Business Communication*, 44, 3-12.

Katz, Susan M. (2002). Ethnographic research. In Laura J. Gurak & Mary M. Lay (Eds.), *Research in technical communication* (pp. 23-45). Westport, CT: Praeger.

Killingsworth, M. Jimmie, & Jones, Betsy G. (1989). Division of labor or integrated teams: A crux in the management of technical communication? *Technical Communication*, 36, 210-221.

Kirtley, Susan. (2005). Students' views on technology and writing: The power of personal history. *Computers and Composition*, 22, 209-230.

Moran, Charles. (1999). Access: The a-word in technology studies. In Gail E. Hawisher & Cynthia L. Selfe (Eds.), *Passions, pedagogies, and 21st century technologies* (pp. 205-220). Logan, UT: Utah State UP.

Porter, James E., Sullivan, Patricia, & Johnson-Eilola, Johndan. (2006). *Professional writing online 2.0*. Upper Saddle River, NJ: Pearson Longman.

Selber, Stuart A. (2004a). Reimagining the functional side of computer literacy. *College Composition and Communication*, 55, 470-503.

Selber, Stuart A. (2004b). Technological dramas: A meta-discourse heuristic for critical literacy. *Computers and Composition*, 21, 171-195.

Selfe, Cynthia L. (1999). *Technology and literacy in the twenty-first century: The importance of paying attention*. Carbondale: Southern Illinois UP.

Selfe, Cynthia L. (2001). Paying attention to stories about technological literacy. Conference on College Composition and Communication. Adam's Mark Hotel, Denver 15 March 2001.

Selfe, Cynthia L., & Hawisher, Gail E. (2004). *Literate lives in the information age: Narratives of literacy from the united states*. Mahwah, New Jersey: Erlbaum.

Sullivan, Patricia, & Porter, James E. (1997). *Opening spaces: Writing technologies and critical research practices*. Westport, CT: Ablex.

Takayoshi, Pamela. (1996). Writing the culture of computers: Students as technology critics in cultural studies classes. *Teaching English in the Two-Year College*, 23, 198-204.

Vik, Gretchen N. (2001). Doing more to teach teamwork than telling students to sink or swim. *Business Communication Quarterly*, 34(4), 112-119.

Wolfe, Joanna L., & Alexander, Kara Poe. (2005). The computer expert in mixed-gendered collaborative writing groups. *Journal of Business and Technical Communication*, 19, 135-170.

Young, Richard E., Becker, Alton L., & Pike, Kenneth L. (1970). *Rhetoric: Discovery and change*. San Diego: Harcourt.

Zachry, Mark. (2007). An interview with Andrew Feenberg. *Technical Communication Quarterly*, 16, 453-472.

#### **Provenance:**

**Citation Format:** McGrady, Lisa. "Hidden Disruptions: Technology and Technological Literacy as Influences on Professional Writing Student Teams." *The Writing Instructor*. May 2010. <http://www.writinginstructor.com/mcgrady> [3] (Date Accessed).

**Review Process:** Lisa McGrady's essay was accepted for publication following blind, peer review.