Illuminating Change: Technology, Feedback, and Revision in Writing

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Exploring Technology for Writing and Writing Instruction

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Illuminating Change: Technology, Feedback, and Revision in Writing

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ABSTRACT
Using the method of a formative experiment, this investigation examines how the use of peer revision and collaboration in an online environment, specifically a social network, could be implemented in a middle school classroom to increase revision over multiple drafts and improve the quality of student expository writing. Thirty-six students in two sections of a seventh-grade English language arts class participated in the study. Quantitative and qualitative data were collected prior to, during, and after the intervention to establish baseline data, as well as determine progress toward the pedagogical goal. Analyses reveal improvement in the amount of student revision and quality of student writing, as well as improved peer feedback using an online community for peer revision and collaboration. The enhancing and inhibiting effects of technology in this intervention is examined, as well as the unanticipated effects of the intervention.

INTRODUCTION
As digital technologies have changed, so has writing. Web 2.0 tools are in common use and, as part of an increasingly participatory culture, we are all creators of media for public consumption (Jenkins, Clinton, Purushotma, Robison, & Weigel, 2009; Yancey, 2009). According to research by the Pew Internet and American Life Project, 95% of teens are now online with 70% of teens taking the time to go online daily (Lenhart, Madden, Smith, Purcell, Zickuhr, & Rainie, 2011). Teens are active users of social networking sites, with 80% of teens actively engaged in some kind of online social media (Lenhart, Madden, Smith, Purcell, Zickuhr, & Rainie). Therefore, most teenagers aged twelve to seventeen are using some form of electronic personal communication, from sending email to text messaging to posting comments on social networks. Many online spaces foster collaboration and interaction with others through writing, yet, for students, the literacy of their
everyday lives, or out-of-school literacy, and the literacy valued in schools is not always apparent (Rhodes & Robnolt, 2009; Tyner, 1998). Further, teachers may not view students’ out-of-school literacy skills, specifically the writing skills students engage in outside of school, as sufficiently rigorous (Williams, 2005).

Thus, critical questions concerning writing instruction in adolescent education remain. For example, how can educators effectively engage students in writing? How can teachers help students develop as readers and writers and prepare them with skills necessary in the 21st century and relevant to their out-of-school lives? These questions were considered as we designed this study. Studying online and digital technologies is one relevant method to address 21st century skills. Also, the writing workshop model is inherently collaborative, and activity focused on peer revision holds promise to improve students’ critical writing skills. Capitalizing on collaborative online environments during peer revision may be a promising method to engage students in writing. Our study, which was conducted as a formative experiment, considered an intervention, which used a collaborative online writing environment to support peer revision in a middle-school classroom. This chapter describes our methods, the intervention and its implementation, and our findings to discuss the effectiveness of the intervention in the setting in which our study was conducted. First, we consider the relative literature and theory.

THEORETICAL FRAMEWORK

Learning to write is a process deeply entwined in the social and emotional growth of learners (Bomer & Laman, 2004). It is situated and authentically embedded within activity, context and culture (Lave & Wenger, 1991), grounding much of the research on writing in socio-cultural theories of learning (Vygotsky, 1978) and situated cognition (Lave & Wenger, 1991).

Vygotsky’s (1978) socio-cultural theory asserts that learning depends upon people’s interactions with one another; learning is a social act and culture provides the tools that help learners develop understandings of the world around them. A cultural historical theoretical view of learning is sometimes used to capture the complexities of classroom environments (Guiterrez & Stone, 2000). This theoretical perspective embraces the notion that learning is a transactional process (Dewey & Bentley, 1949) mediated by cultural tools, including spoken and written language, as people participate in routine activities in communities of practice (Dyson, 2000; Guiterrez & Stone, 2000; Lave & Wenger, 1991).

Communities of Practice (COPs) are knowledge communities in which people invest their time and energy in a joint enterprise, developing a shared repertoire (Henderson & Bradley, 2008). Gee (2005) describes Lave and Wenger’s (1991) community of practice as one in which learners “...pick up practices through joint action with more advanced peers, and advance their abilities to engage and work with others in carrying out such practices” (p. 77). Learners draw on their own Discourses (i.e. home, community, academic) and as members participate in the community, a new, shared Discourse emerges (Gee, 2005).

PEDAGOGICAL FRAMEWORK

This study particularly focused on peer revision in the writing process in an online setting. Teaching students how to successfully respond to peers’ text, as well as to read and understand critiques of their own work, and provides adolescents with the skills they will need to move forward, both in academic environments and in the larger world. Revision gives students the opportunity to not only re-examine their own ideas, but also examine and internalize elements of effective writing in a variety of contexts (Bruffee, 1985). Although peer revision is an important component of the
writing process, many classroom teachers spend little time on peer revision (National Writing Project, 2003), and adolescents struggle with the peer revision process.

For instance, students reported they were not always honest in their appraisal of one another's work, for fear of alienating peers (Styslinger, 1998; Styslinger, 2008). Also, differences in perceived writing ability, as well as group members who are reticent to speak, or group members who may overwhelm their peers, are also issues that have emerged in peer revision groups (Sommers, 1993). Peer status, gender, and race may also affect the feedback students receive from one another and whether that feedback is valued (Christianakis, 2010). In addition, it may take years for even high school students to develop necessary skills to become helpful peer reviewers (Simmons, 2003), and both teachers and students may become disenchanted and abandon the process (Lawrence & Sommers, 1996; Styslinger, 1998).

Yet, online writing environments and tools may hold potential in addressing these concerns. Online writing environments may alleviate adolescents' concerns regarding offering of constructive criticism or suggestions to peers; developing a Discourse (Gee, 2005) with peers online may allow students to try on new identities, offering potential avenues for honest feedback. Existing research suggests features such as tracking changes may be an effective technique for revision in classrooms (Carmichael & Alden, 2006). Further, peer response through digital communications may lead to more revision by writers (Tuzi, 2004) as well as more thoughtful feedback by reviewers (Crank, 2002).

However, the literature on peer revision in online settings is limited in K-12 education research, specifically in middle-school classrooms. The majority of studies of peer revision are situated in the context of freshman composition courses (Brammer & Rees, 2007; Carmichael and Alden, 2006; Crank, 2002; Eades, 2002; Strasma, 2009; Tomlinson, 2009), and a few studies examine revision in high school classrooms (Karegianes, Pascarella, & Pflaum, 1980; Moran & Greenburg, 2008; Simmons, 2003; Styslinger 1998; Styslinger, 2008). This leaves middle-school teachers few resources to turn to when looking for effective ways to implement or enhance peer revision. In addition, few resources are available addressing the use of digital technology to enhance writing and peer revision. Research focusing on efforts to effectively integrate peer revision into the middle-school classroom using online resources and platforms is needed to address gaps in theory and pedagogy.

This study used a formative experiment to explore the use of online environments as new spaces for peer revision in a middle school classroom and to address current barriers to the integration of peer revision in classrooms. Specifically, our investigation examined how peer revision and collaboration in an online environment could be implemented in a seventh-grade classroom to increase revision of writing over multiple drafts and improve the quality of student expository writing.

**METHODOLOGY**

Formative experiments are one of several approaches to research referred to collectively with overarching terms such as design-based research or design experiments (Barab & Squire, 2004; Brown, 1992; Design-Based Research Collective, 2003; Hoadley, 2004; van den Akker, Gravemeijer, McKenney, & Nieveen, 2007). In a formative experiment, the investigator sets a pedagogical goal, instead of a research question, and selects an intervention that shows promise to achieve the goal or alternately designs an intervention that may help achieve the goal. The pedagogical goal for this formative experiment was:

*Increase the amount of revision that occurs over multiple drafts of students' writing and improve the quality of student expository writing through online peer revision and collaboration in a middle school English language arts classroom.*
In education, formative experiments are often seen as a means to bridge the gap between theory and practice (Reinking & Bradley, 2008) and to refine and develop pedagogical theories in authentic contexts (Bradley & Reinking, 2011). In a formative experiment, instructional difficulties, obstacles, and even failures are viewed as useful data that can inform instruction and help build pedagogical understanding. Nevertheless, the aim of formative experiments are not to offer prescriptive solutions to pedagogical needs; rather, the goal is to identify relevant factors, including obstacles, that inform how instruction can be carried out more effectively.

Participants and Context

Participants were 36 students in two sections of a required English language arts class at Wilson Middle School (pseudonym), one of several middle schools in a large Southeastern school district in the United States. Wilson consistently failed to make Annual Yearly Progress, as outlined by No Child Left Behind, and was following a mandated restructuring plan at the time of the study. Approximately 93% of students at the school received free or reduced meals. Student participants reflected the diversity of the school, with 14 students self-identified as African-Americans, 12 as Hispanic, and 10 as Caucasian. Of the 36 participants, 13 were female and 23 were male. A total of 11 participants were English language learners and 2 received special education services. No participants were identified as gifted and talented. Participants in this study had among the lowest writing scores in the state on the writing test given at the end of sixth grade, with just over 60% not meeting the required standard for basic proficiency.

Although this site was considered challenging for this investigation, it was selected because it was likely to be a supportive environment for this type of writing instruction and intervention, with one-to-one laptops, on-site technical support, an instructional coach who was formerly an English language arts specialist, and several teachers who completed coursework in both writing workshop and using technology in the classroom through a local university.

Ms. Piper, the teacher, had six years of teaching experience, all at Wilson. At the time of the study, Ms. Piper had completed a master’s degree and also achieved National Board Certification. She was well versed in writing workshop, having completed coursework focused on writing, and was also a teacher-consultant with the local site of the National Writing Project. We recruited her to participate in the study because of her expressed commitment to writing in her classroom and openness to using technology in her classroom.

The Classroom Environment

Prior to the implementation of the intervention, we collected observational data to better understand the environment of the school and specifically to observe Ms. Piper’s classes. The intent of these observations was to create a thick description of the classroom setting (Patton, 2002), a critical phase in conducting a formative experiment (Reinking & Bradley, 2008). The students’ classroom and learning routines were well established when we gathered these data mid-year. Initial observations of this classroom revealed that students used laptops each day, for both reading and writing. Students were accustomed to composing on the computer, as well as saving their work to common spaces. Their school routines were established and structured. Students spent 60 minutes each day in their English language arts class, and had an additional 30 minutes daily devoted to sustained silent reading. They also had 30 additional minutes of English language arts each week with their teacher as part of an advisory/tutorial program. The teacher allowed students to come in to work both before and after school if they needed extra time or assistance.
THE INTERVENTION

The intervention phase of the study lasted 13 weeks. For the purposes of this study, online peer revision and collaboration were defined as having the following components: (a) an online space for students to post work and provide feedback; (b) the ability for students to track changes made to their work; (c) the ability for a student to request feedback from peers in writing at any stage of their writing; and (d) the ability for students to respond to feedback from their peers. These components were essential to the intervention and were not subject to modification during the intervention.

Selecting the Online Space

Appeal is an important aspect of any intervention in a formative experiment (Reinking & Bradley, 2008). We selected a Ning (www.ning.com) as the platform for our online interactions. Nings might be best described as closed, social networks, with many features similar to Facebook that appeal to adolescents, such as built-in email, the ability to friend users, status updates, the ability to upload pictures to and maintain a user profile, and the ability to give gifts. Users can also upload documents, videos, and pictures. These features seemed likely to support four key elements to developing successful online communities: remuneration, influence, belonging, and significance (Howard, 2010). For our study, only those invited could see the Ning site, contact one another, and share documents, which made the school and teacher feel it was a safe option for instruction in school.

Function was another important consideration. Downloading and uploading documents was straightforward: the user clicked on a button and a dialogue box appeared with simple instructions. Students were able to compose in Microsoft Word and upload documents to the Ning. The Ning also allowed users to include messages about the uploaded documents; students could include specific requests for feedback or assistance with each file uploaded. More importantly, the Ning did not convert uploaded documents to another format. This feature was critical, as students could use the revision toolbar within Word to track changes and use the comment feature to make suggestions.

Implementing the Intervention

Students participated in peer revision in class at least once each week, both as a reader and a writer, responding to drafts at a variety of points in the writing process. This practice was based on both writing theory and research which suggest students should be given time to write and receive feedback throughout the writing process (Atwell, 1988; Calkins, 1986; Fletcher & Portaluppi, 2001). Meta-analyses also suggest the importance of peer assistance during the writing process for K-12 students (Graham & Perin, 2007a; Graham, McKeown, Kuhlara, & Harris, 2012). The intervention was implemented in two stages, based on research on successful peer revision in classrooms (Crank, 2002; Karegianes, Pascarella, & Pflaum, 1980; Moran & Greenburg, 2008; Simmons, 2003; Strasma, 2009), which suggested students needed face-to-face practice with peer revision before moving into the online model.

The first stage of the intervention, which lasted one week, included direct instruction on responding to peer writing, with practice responding in face-to-face groups. We chose to teach the students a technique (TAG – Tell, Ask, Give) to frame their responses to one another’s writing with Ms. Piper modeling feedback during a mini-lesson using TAG to provide a scaffold for peer revision.

Stage two, which lasted 12 weeks, included the implementation of digital technologies in the writing process, including the use of tracked changes and comment features in Microsoft Word, students posting work to an online forum, and student response through the online forum. Ms. Piper modeled feedback during a mini-lesson using the TAG structure previously taught, offering each student some feedback on the first piece they
posted. Students then posted and offered feedback to one another through the online forum.

Ongoing instruction in responding to peer writing took place throughout the intervention, as suggested by research on peer revision (Moran & Greenburg, 2008; Simmons, 2003). This instruction was provided through mini-lessons and modeling, based on progress toward the goal. Throughout the intervention, we assumed the role of participant observers (Patton, 2002). The first author was present in the classroom observing students during the two days per week they were focused on writing. Ms. Pipertaught mini-lessons and led the instruction and the first author took detailed field notes, often moving around the room to observe what students were doing. This approach created an environment where students treated the first author as an assistant teacher and another classroom resource for student questions. Students sometimes asked the first author to read something they had written and give her opinion or offer help with surface features (spelling, etc.), but students turned to Ms. Piper for instruction and clarification on the assignments at hand.

DATA COLLECTION AND ANALYSIS

The first author was the lead researcher in this study and was primarily responsible for designing and implementing the intervention and data collection. The second author served as a literacy resource and provided insight into data analysis and findings. Our study used a mixed-methods approach (Creswell, 2003). Qualitative data was systematically collected and analyzed to measure progress toward the pedagogical goal and identify factors that enhanced or inhibited the intervention. These data included participant observations, field notes, classroom artifacts such as student work samples, and all electronic communications between participants on the Ning. Scored writing samples provided quantitative data to measure writing progress. Student writing samples composed over a period of time with peer feedback were collected for all students the month prior to the intervention, at week 7 of the intervention, and again at the conclusion of the intervention.

We selected 9 focal students, 4 from the smaller below-grade level class section and 5 from the on-grade level class section, for close analysis during the intervention, a common practice in formative experiment research (Reinking & Bradley, 2008). Selected students represented the range of students in the classrooms: students with positive and negative attitudes toward writing (as reported on a writing dispositions survey, see Piazza & Siebert, 2008), and students who enjoyed school as well as those who were disengaged, based on field notes and teacher input. Focal students were also representative of the school’s gender and race demographics.

Using previous formative experiments as models, weekly analyses of field notes, student-writing samples, classroom artifacts, and electronic communications informed the progress of the intervention and were used to make justifiable modifications to the intervention based on data analysis. In addition to these on-going modifications, data helped to determine the degree to which the environment was transformed by the intervention, using retrospective analysis (Gravemeijer & Cobb, 2006), which is a holistic analysis conducted after all data have been collected.

All quantitative data was examined using a pre-post model, with baseline data gathered before the intervention and again at the end of the intervention. Trained scorers, using the National Writing Project's Analytic Writing Continuum, scored writing samples independently, and on a scale of 1-6, based on content, structure, stance, sentence fluency, diction, and conventions. Each piece also received a holistic score, which scorers assigned independently of the individual attribute scores. All samples were scored twice and inter-rater reliability, defined as having identical scores or scores within one single point of one another, was 95%. Using paired t-tests, we analyzed scores before and after the intervention.
Beginning at the outset of the intervention phase and continuing through retrospective analyses, qualitative data was analyzed using sequential data analysis (Miles & Huberman, 1994) using a process of open coding, allowing emergent themes and patterns to develop (Miles & Huberman, 1994). We also looked for disconfirming evidence during the following observation for each theme identified to assess whether these were representative (Miles & Huberman, 1994) and trustworthy (Lincoln & Guba, 1985).

To achieve triangulation (Creswell, 2003), a criterion for rigor in formative experiments (Reinking & Bradley, 2008), we considered and compared observational and interview data with student writing, electronic communications, and student think-alouds codes and themes. Member checks (Creswell, 2003) were also conducted with Ms. Piper throughout the intervention and data analysis process. After retrospective analysis, a final member check with Ms. Piper was conducted to confirm the validity of the identified themes.

RESULTS

Here, we examine the results of our formative experiment in terms of progress toward its goal and how technology enhanced and inhibited this intervention.

Improvement in Students’ Expository Writing and Amount of Revision

Data suggested progress toward the pedagogical goal of both increasing the amount of revision and improving the quality of student writing. We analyzed the pre- and post-intervention writing samples (n=30) using a paired samples t-test. The results of the scored writing samples are found in Table 1 and indicate statistically significant differences (alpha = .05) between the pre- and post-writing samples overall, as determined by the holistic score, as well as across the six measured attributes: content, structure, stance, sentence fluency, diction, and conventions.

When examined as individuals, twenty-eight out of 30 students showed overall growth between the pre-writing sample and the post-writing sample, represented by the holistic score. Two students received the same holistic score pre- and post-intervention.

Qualitative data also consistently pointed toward progress in writing achievement and revision and will be discussed in the following subsections with representative data excerpts.

Enhanced Definitions of Revision

Both mid-intervention interviews with focal students and field notes suggest students developed

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Pre-Mean (SD) (n=30)</th>
<th>Post-Mean (SD) (n=30)</th>
<th>Gain (SD) (n=30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holistic</td>
<td>2.65 (.95)</td>
<td>3.98 (.71)</td>
<td>1.33 (.87)</td>
</tr>
<tr>
<td>Content</td>
<td>2.68 (1.03)</td>
<td>4.12 (.91)</td>
<td>1.43 (.94)</td>
</tr>
<tr>
<td>Structure</td>
<td>2.45 (.83)</td>
<td>3.90 (.74)</td>
<td>1.450 (.96)</td>
</tr>
<tr>
<td>Stance</td>
<td>2.55 (.87)</td>
<td>4.23 (.73)</td>
<td>1.683 (.97)</td>
</tr>
<tr>
<td>Sentence Fluency</td>
<td>2.50 (.89)</td>
<td>3.87 (.71)</td>
<td>1.367 (.94)</td>
</tr>
<tr>
<td>Diction</td>
<td>2.58 (.98)</td>
<td>3.80 (.65)</td>
<td>1.217 (.97)</td>
</tr>
<tr>
<td>Conventions</td>
<td>2.55 (1.03)</td>
<td>3.73 (.68)</td>
<td>1.183 (.95)</td>
</tr>
</tbody>
</table>

p-value ≤ .001 for all mean differences

Table 1. Pre- and post-intervention means for student writing samples

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more complex and nuanced definitions of what it meant to revise their work as the intervention progressed. For example, in her pre-intervention interview, Dee described revision as, “To look over and see what mistakes you made or something.” In our mid-intervention interview, Dee explained revision by stating, “To make sure the spelling’s right and all that and make sure it makes sense and make sure you are not boring and you still have their attention or something.” Dee continued to expand her definition of revision, explaining in her final interview that revision meant, “To check spelling and see if it makes sense. If it confuses you or something, you might want to change it or something. Add more information or take information out or rearrange it.” Dee’s progress was representative of other participants, and over time, student definitions of revision expanded.

Evidence of Revision

Data also provided evidence of increased revision in student writing. Field notes from observations of the classroom a month prior to the intervention indicated little revision. When students were engaged in revisiting their work, they focused primarily on editing.

One student, Javon, asked me to read his piece of so far. He had very little written and he wanted help correcting his spelling. I made the comment that he might consider focusing on the content of his piece first and he said, “What’s content?” (field notes, 12/7).

As the intervention progressed, more evidence of revision became apparent in both classrooms. Field notes describe students in both classes working through multiple drafts and adding information, as well as giving one another feedback. A typical entry follows:

Juan has been working with the track changes on, adding new information from his notes and this is the first time I’ve seen that. With track changes on, I saw more revision than I had seen in all their writing to date (2/15).

Teacher interviews also indicated revision increased during the intervention. Ms. Piper revealed some of the revision she was seeing in the classroom in her mid-intervention interview.

I see them having conversations about if a piece sounds right or finding more information to put into it. Devante said to me today, “I read this and I think I missed that.” He noticed that it didn’t make sense and said, “I’m going to go change it.” He wasn’t doing that before.

Student posts on the Ning, using the track changes feature in Microsoft Word, revealed that students were posting and revising throughout the writing process. Students wrote multiple drafts and revised them using feedback from peers throughout the intervention. Kimberly, a student reading below grade level prior to the intervention, provides an example of this revision and feedback process. Figure 1 is Kimberly’s first draft of a “This I Believe” essay. Figure 2 is the feedback offered to her by another student, also considered to be reading below grade level. Figure 3 is Kimberly’s final draft.

Role of Technology

Technological factors that enhanced the intervention included perceptions of playfulness and visibility of progress. However, qualitative data suggested a lack of support and an emphasis on delivery of instruction also played a role in the intervention, perhaps inhibiting progress toward the goal of increased student revision and improvement in the quality of writing.
I believe in using coupons, going to goodwill and the dollar tree. My mom had taught me how to use coupons and going to the dollar tree and goodwill. Every time I go to goodwill, I always can find stuff for a dollar and it save me and my mom some money. A lot of my friends don’t go to goodwill but I do, and at the dollar tree everything there is a dollar. So I can get all the stuff I need for only a dollar. We go other places to my mom are always to tell me to use coupons and go to the Clarence. I had got this make but it had cost more then I had but my mom had a coupon so then I can afford it. My mom says you have to save money because of price these days. When I am older and I have to pay bills I will be especially be using coupon and going to goodwill and dollar tree. My mom tells me she might not have food stamps and a lot of money but she has coupons and she can go to the dollar tree and goodwill.

The perception that this was a space where students could be more playful while at school was reflected in students’ use of texting language in their electronic communications with one another on the Ning. Throughout the school day, students were asked to use Standard American English in their communication with both teachers and one another. For the Ning, students developed and recorded writing rules in class and in both sections students specifically sanctioned the use of texting language. The student recording the rules in the below-grade-level section chose to use the informality of text to make his point: “Yu en use txt language 4 cmts.” Data suggested all students followed this rule. Abbreviations common to texting are evident in their informal
communications with one another on the Ning, but were largely absent from their more formal writing assignments. Students also blended Standard American English with their own vernacular, including Spanish for bilingual students, in their comments to one another.

The playful tone of the Ning was also reflected in students’ choices of monikers for themselves in the online space and the pictures they chose as icons. Students chose pseudonyms such as Tankhead, fallen_dark_S; angel, -gummyboo-:, starburst, and Wakko. Pictures students used to represent themselves ranged from religious figures to celebrities to cartoon characters. Other students chose to use pictures they had taken of themselves with cell phones.

Field notes and electronic communications also suggested students used the Ning as a way to communicate with one another, as well as for academic purposes. Ms. Piper recognized this use of the Ning for non-academic purposes as well and discussed it during her mid-intervention interview.

_I know that they’re sometimes not totally on task on there but I feel like in order to have the community that has to happen at some point like you have to feel like you’re in the community, you know? So I haven’t felt like that’s been a big distraction probably just a good thing that they leave each other little gifts and stuff._

Although the online space afforded opportunities for students to be off-task, we felt it was important to maintain the social aspect of the community. Howard’s (2010) concept of remuneration informed this decision; we wanted to provide students with a satisfying and engaging experience.
Visibility

The visibility of both student revisions, through the track changes feature on Microsoft Word, as well as through comments to one another using both the comment feature in Word and the Ning, made the work of both composition and revision visible to not only the teacher, but also to the students themselves. Data suggested that the visibility of work was an important factor in student revision.

Ms. Piper noted that she was seeing more revision when students started using the track changes feature in Microsoft Word. She noted in her mid-intervention interview, “Track changes I think was awesome. The fact that it’s posted on the Ning and somebody’s going to read it and reading other people’s suggestions I think helped a lot.”

The visibility of track changes came up again in our post-interview. “Tracking the changes I think was so motivating and helped them to see the ways their writing changed.”

Students also expressed appreciation for the visibility technology afforded them. Brad, a student who struggled as a writer throughout the intervention, noted after participating in the think-aloud protocol, “Now that I can see how people have helped me, I can help other people in that way... when they help me like, like I have you, then it helps me help other people.” Other students also talked about the value of being able to see comments. Troy, a more willing writer, found it helpful to be able to go back and revisit comments when revising his writing. “Because like if I get a comment off the Ning that’s like something that like I can remember to do, because it’s on there, but if you’re doing it face to face like you can forget to do it sometimes” (Post-intervention interview, 4/28).

In sum, technology enabled students to make their thinking visible to one another and encouraged students to make changes to their writing, resulting in more revision. It also offered students models for peer feedback, which students found helpful during the peer revision process.

Technological Factors that Inhibited the Intervention

Lack of Support

Although the school had a one-to-one laptop initiative, the laptops were four years old and needed repairs for issues like keys falling off the keyboard. When laptops were sent out for repair, it could be weeks or months before they were returned. At the start of the intervention, Ms. Piper had 22 functional laptops in her room available to students. By the end of April, there were 15 functional laptops in Ms. Piper’s room. Toward the end of the intervention, Ms. Piper was sending students to other spaces to work on their writing. Because Ms. Piper approached writing using a workshop model, this detracted from instruction. Ms. Piper’s ability to scaffold and target instruction to improve student writing was inhibited by this development.

Emphasis on Delivery of Instruction

Data also suggest that technology was typically used in the school for delivery of instruction, rather than to enhance instruction. Administrative support for using the laptops was focused on test taking. Due to budget constraints, benchmark tests in the school were delivered to students via laptops. Rather than printing copies of quizzes and tests, all quizzes and tests at the school were delivered online. Teachers were encouraged to closely monitor student use of the laptops. During the intervention, the administration asked Ms. Piper to rearrange her classroom so she could see every computer screen from the rear of the classroom. This vision of a teacher as a monitor and computers as a way to deliver instruction...
inhibited the intervention, as Ms. Piper had to alter her classroom instruction to some degree to satisfy the requirements set forth by school administrators.

DISCUSSION

Formative experiments consider practical as well as theoretical aspects of classroom research (Reinking & Bradley, 2008). Thus, in this section we discuss our findings by first presenting an unanticipated effect of the intervention on the classroom environment, which is an important component in conducting formative experiments (Reinking & Bradley, 2008) and then drawing connections to the literature base.

Unanticipated Effect of the Intervention

According to Reinking and Bradley (2008), formative experiments will likely have effects the researcher may not have anticipated at the start of the intervention. Analysis of data revealed one major unanticipated effect that was outside the original scope of the intervention: the possibility of accelerated learning by students in how to give effective peer feedback.

Although the intervention was intended to increase revision in student writing and assist students in giving one another meaningful feedback, we did not expect students to become expert in giving peer feedback over the course of the intervention. For example, Simmons (2003) suggested it might take years for students to become effective responders for one another.

Data suggested, however, that making feedback visible through the track changes feature and the Ning may have accelerated students learning process. During the think-aloud protocol, students independently focused their comments and suggestions on content and structure when offering suggestions on a cold piece of text. This focus differed from the start of the intervention, when students own definitions of revision were limited to “fixing mistakes” which they defined as errors in grammar and punctuation. During post-intervention interviews, focal students reported learning how to become better peer reviewers. For example, Brad noted, “I learned how to actually give helpful suggestions rather than just criticizing people’s writing...It helped me actually, since I know how to actually revise people’s work now, it helped me learn how to revise mine better than I did.” Ms. Piper also noticed a difference in her students’ comments.

I think they gave each other really excellent feedback. It was a lot easier than I thought it would be. I thought they would not know what to say. I think they learned to enjoy it and to really think like a writer. I think by revising the other person’s, they really learned how to look back at their own, too.

Ms. Piper reported that students seemed to have learned to offer one another effective feedback with little scaffolding or instruction on the part of the teacher.

One thing that really surprises me about the Ning is we don’t have to say look for this or look for that and to scaffold their revising, like a lot teachers think you have to do. You know, give them a revision sheet to follow. They just needed that structure of somewhere to put their work.

Thus, students became more adept at offering feedback than the existing studies suggested may be expected.

Theoretical Implications and Considerations

In this investigation, an online community was established as a vehicle for students to offer one another peer feedback to increase the amount of revision in middle school students’ writing over
multiple drafts and improve the quality of their writing. The results of this study are significant for several reasons: the results support findings from college classrooms that asynchronous feedback may be an effective tool in peer revision (Crank, 2002; Honeycutt, 2001; Strasma, 2009) and the use of computers in K-12 environments may support improvement in the quality of student writing (Goldberg, Russell, & Cook, 2003; Moore & Karabenick, 1992). The results also offer support for the use of online spaces as potential academic communities of practice (Britsch, 2005; Clarke, 2009; Gunawardena, Hermans, Sanchez, Richmond, Bohley, & Tuttle, 2009). These findings, though not generalizable, may contribute to local theory and support the use of comparable interventions in middle-school settings similar to the one in this study (Firestone, 1993).

Admittedly, however, the context of this study may have fostered success. Despite the fact the school selected served many at-risk students with many students struggling to achieve grade level standards, Ms. Piper’s openness to the idea of using technology in her classroom and commitment to writing may have counteracted these factors. Existing research suggests time to write (Cutler & Graham, 2008; Graham & Perin, 2007b; National Commission on Writing, 2003) and the ability to collaborate with peers (Coker & Lewis, 2008; Gere, 1987; Gere & Abbott, 1985; Graham & Perin, 2007b; Langer, 1999, 2000) are effective instructional tools in the teaching of writing. Ms. Piper’s willingness to structure and organize her physical environment and instructional time to facilitate collaboration and revision among students was critical to the success of this intervention. Ms. Piper’s awareness of student’s need for social interaction likely helped maintain the feeling that the Ning was a space that allowed for play, as well as for the academic work of the classroom, which kept students engaged. Replication of this study across multiple environments is essential to better understand how the results may differ across contexts.

FINAL THOUGHTS AND CONCLUSION

The present investigation, although promising, is a very small part of a much larger picture. How do we help students develop habits of mind that encourage them to revisit and revise their work to improve writing in our schools? And, how do we encourage teachers, who are less enthusiastic about technology integration, to utilize online resources to improve writing and revision in schools? This formative experiment reveals one instructional strategy that may be promising to address both of those questions. Overall, we concluded that building an online academic community supports students as writers and fosters an environment and space where students feel comfortable engaging in revision and are encouraged to become editors. This study provides support for the implementation of similar online writing models in middle-school English classrooms. We believe, however, the present investigation should be replicated in a variety of contexts to add to pedagogical theory, provide useful models, and inform instructional practice in K-12 settings.

REFERENCES


