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The Journal of Technology, Learning, and Assessment

Volume 3, Number 1 · May 2004

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www.jtla.org

A publication of the Technology and Assessment Study Collaborative
Caroline A. & Peter S. Lynch School of Education, Boston College

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JTLA is a free on-line journal, published by the Technology and Assessment Study Collaborative, Caroline A. & Peter S. Lynch School of Education, Boston College.



Preferred citation:

Friedman, A. A., Zibit, M, & Coote, M. (2004). Telementoring as a collaborative agent for change. *Journal of Technology, Learning, and Assessment, 3*(1). Available from http://www.jtla.org

**Abstract:**

This case study explored the effectiveness of telementoring as a vehicle for preservice teachers to hone skills in the teaching of writing, to establish a mentoring relationship with urban high school students, and to help struggling writers improve writing skills necessary for student achievement. Inherent in this research was the goal to develop a collaborative model between the university and the high school for using technology to improve "at-risk" urban students' skills in writing. Additionally, the research allowed preservice teachers to learn about themselves as evolving teachers as they broached some of the difficulties of teaching writing to academically diverse students and learned about the scarcity of resources and difficult realities that exist for urban students.

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# Telementoring as a Collaborative Agent for Change

## Introduction

The bell rings. A sea of faces fills the freshly painted hallways of a century old, city school building, as classes change for the third time this morning. Sounds and conversations vary like the students themselves – loud and gregarious, soft and concerned, giddy and excited, angry and determined, concise and witty – as they move on to the next experience that in the best of circumstances will stimulate and motivate learning or in the worst, repeat the same old, same old. We enter the now empty classroom where a veteran teacher of 30 years introduces herself. Like her students, her tone reflects a range of emotions, from excited as she talks about possibilities, to angry as she shares the frustrations of trying to get computer workstations up and running in her classroom in order to serve her 54 struggling, low-performing students. She articulates the litany of problems that enhance the ever-widening digital divide so common to the urban school context. "There are not enough outlets, there is not enough space, and there are not enough computers. And, central tech. support has to service other schools before anything is done here! It seems that we used up our 'chit' just by having the computers installed!" Yet, she talks with energy and enthusiasm about using telecommunications to link her urban students with college students who will mentor them in writing.[1]

We live in an age where communicating information effectively is critical to success within our ever-expanding global society. The ability for all citizens to communicate interpersonally, publicly, and interculturally enhances the individual's, organization's, and society's chances for achieving important and productive goals and constructing a more socially just society (Baldoni, 2002; Demorest & Grady, 2002). Technology can be an effective catalyst for engaging students in authentic learning and improving student achievement (Means, 2000; Means, Penuel, & Padilla, 2001). It can provide a context that gives students the opportunity to carry out complex skills with more success than they could individually. An inability to use technology at least at a minimum level of competency not only denies young people access to information, opportunity, and competitive markets, but it also further expands the digital divide, leaving already

marginalized students further behind (Murnane & Levy, 1996). "The integration of computers into the classroom is just one small part of what is needed to reinvent schools" (http://www.nap.edu/readingroom/books/techgap/opportunity.html).

The following case study explored the effectiveness of integrating two kinds of technology, personal computers and AlphaSmarts, into two urban high school classrooms via a telementoring writing program in order to enhance students' writing skills and preservice teachers' mentoring skills in teaching writing. Two research questions focused this study: What is the effectiveness of telementoring as a vehicle for improving urban high school students' skills in writing? What is the effectiveness of telementoring in helping preservice teachers hone their skills as teachers of writing?

## Telementoring: Technology, Writing, and Mentoring

Telementoring is online or virtual mentoring (Foster, 1999; Zeeb, 2000), a computer-mediated variation of the traditional "dynamic relationship between an individual who needs to learn and one who is willing to help and guide" (Newby & Corner, 1997, p. 11). By linking students and mentors online (telementoring), mentors need not be physically proximate nor do interactions need to be synchronous, factors that commonly limit the success and sustainability of face-to-face mentoring programs. Telementoring is becoming a way to "pair teachers and learners with subject-matter experts who can provide advice, guidance and feedback" (Zeeb, 2000, p. 7). Telementoring derives from mentoring, an educational process in which an experienced person gives guidance, knowledge, and encouragement to a learner. And while there is no widely accepted operational definition of mentoring (Jacobi, 1991) effective mentoring relationships generally reflect several essential characteristics. They are helpful, personal, and reciprocal relationships that focus on achievement and provide emotional support (Freedman, 1993). Mentoring differs from tutoring, a process that is solely focused on academic and remedial assistance in a particular area, as it focuses on nurturing the development of character and competence in a younger person (Freedman, 1993; O'Neil, 1997). Mentoring allows mentees to develop and learn through conversations with older members of a society who have accrued more experience with society's intellectual skills and tools (Freedman, 1993; Rogoff, 1990, 1993) and who share strategies that mentees can incorporate into their thinking (Radziszewska & Rogoff, 1988, 1991). Research observes that the one-to-one nature of mentoring relationships improves academic performance (Dulin, Lammers, Mason, & Graves, 1994) and significantly increases the likelihood of college attendance (Sipe, 1999).

Theoretically, telementoring offers participants more benefits than the conventional kind of mentoring such as consistency, availability, speed, and access. This written medium of conversation allows spontaneity and flexibility that can be an effective tool for communication and collaborative learning (McMullen, Goldbaum, Wolffe, & Sattler, 1988; Schrum, 1991). Because the telementoring relationship is computer-mediated, mentees and mentors have a certain amount of anonymity that can facilitate more open exchange, a phenomena called the "strength of weak ties" (Levin & Cross, 2002; Granovetter, 1982). Mentors need not be experts. Roerden (1997) noted that pairing younger students with older students with an interest in the field in Web-based projects can be just as or more effective than matching students with experts (Harris & Jones, 1999; Harris, O'Bryan, & Rotenberg, 1996; Lenert & Harris, 1994). Tools of technology can help learners identify and focus on gaps in learning and thinking and educators better match instruction to student needs, addressing diversity and diverse learning styles more effectively. Using technology enables a sense of empowerment, independence, ownership, mastery, and fluency of thinking (Russell, Bebell, & Plati, 2001a). Computer technology is especially useful in reinforcing how children learn by supporting active engagement, participation in groups, frequent interaction and feedback, and connections to real-world contexts (Harasim, 1990; Roschelle, Pea, Hoadley, Gordin, & Means, 2000). For at-risk students, the benefits are even more powerful. Effective technology use can provide students opportunities to practice skills or tasks in an authentic context and can even enhance performance on standardized tests (Bryson & Scardamalia, 1991). Since at-risk students are more likely not to have computers and other technology at home it is even more imperative that they have access to it in schools to ensure that "all students have technological equity and access to the learning tools of the 21st century" (North Central Regional Educational Laboratory, 1997, p. 3). There are other important reasons for using technology. Technology can offer a format for interactivity and cultural exchange provided the exchange is not ideologically or politically one-sided, and that all students have consistent access to the conversation. Alleviating many of the hurdles that accompany face-to-face mentoring, telementoring does not require travel, eliminates scheduling issues, lessens biases potentially inherent in physical relationships, and focuses the relationship on content rather than emotion (Nellen, 1998, 1999).

The National Council of Teachers of English encourages the use of technology in exploring ways to teach English language arts. "Technology can make significant changes in the character of writing instruction, writing habits of students and the nature of the writing process" (Schwartz et al., 1989, p. 142). Computers transform the focus from the teacher to the student and to a more process-centered pedagogy in writing.

Through telementoring, mentors assess the needs of protégés and develop personalized coaching that dramatically improves students' writing ability over time by providing a real audience (Nellen, 2001; Patterson, 2001; Schank, 2002). Essentially, telementoring in writing instruction can offer immediate educational gains and "improve attitudes toward learning in general and writing in particular" (Schwartz et al., 1989, p. 145). Students pay more attention to the constructive criticism that comes through a mentor, are more willing to listen and incorporate critique into their work, and are more relaxed with the perceived anonymity that comes from communicating over the computer rather than face to face (Means, 2000). As the mentoring relationship is reciprocal, mentors examine and modify their own beliefs about writing and learn strategies for responding to student-generated texts (Dulin et al., 1994). Mentors and teachers who use technology are more likely to change pedagogy or focus instructional practice in constructivist-oriented directions (Becker, 2000; Hunter, 1997; Ravitz, Becker, & Wong, 1998), and for preservice teachers, telementoring has helped hone teaching practice in literacy (Doering & Beach, 2002; Dulin et al., 1994).

Telementoring has the potential to offer specific benefits for urban and other marginalized students. As urban students continue to fall behind in technology understanding and application (Teel, Debruin-Parecki, & Covington, 1998) and continue to lack access to participate in beneficial technology-based projects (Luke & Luke, 1999; Dimitriadis & Kamberelis, 1997), telementoring can offer access and one answer to disturbing current trends in differential infusion of technology. "Differential infusion reflects a strong link between poverty and racism; thus distribution must be more equitable especially among urban centers" (Burnaford, Fischer, & Hobson, 2001, p. 86). Reflected in the classroom teacher's remarks in the introductory passage, however, is the critical relationship between the school's or the system's ability or desire to procure, implement, and support technology and effective infusion of technology into classroom learning.

In order for telementoring to be successful, certain conditions must be present. Foremost, Internet-connected computers in the classroom for word processing and the submission of assignments to mentors and responses back must be readily available (Bennet, 1997; Neils, 1997). Another element is time – time to re-craft curriculum for telementoring, time to test and prepare equipment before each class, time to manage student use of computers during class, extra time for keyboarding assignments, and time for reading mentors' comments (Harris, 2001; Harris, 2002). Teachers face the challenge of modifying curriculum lessons and learning goals to incorporate the use of mentors, re-design the structure for student tasks (Freedman, 1993), plan operational details of the project

(Harris, 2001; Goldman, 1997) and "scaffolding" for relationship development (Bennett, 1997). As will be demonstrated later in this discussion, the integration of appropriate technology, in this case AlphaSmarts, can be critical to the success of telementoring.

# Exploratory Study

An exploratory case study conducted from January of 2001 to May of 2001, in which preservice English teachers telementored 12 high school special needs students, served as a pilot study for this research. The high school students were motivated and enjoyed having college students interested in them and their work. Students found the technology engaging and were lured into writing. As the classroom teacher read each mentee's draft and the mentor's comments, she observed:

> *Until we began this program, I did not know that one of the students could write more than two sentences. When using paper and pencil, he would struggle, stop, and stare at his paper. All of a sudden, he was sitting at the computer drafting an entire page. Both he and I were pleased with his progress. It opened my eyes to the benefits of this type of relationship.*
> *(Interview with classroom teacher, March 20, 2001)*

Limited resources, dependence on external funding, outdated wiring, obsolete hardware or a lack of hardware, and ineffective support offered significant barriers to technological implementation and limited the extent of the exploratory study. Despite these issues, high school students were so engaged by the technology and the mentoring, a more ambitious case study was launched the following fall.

# Case Study

## Methodology

This study was an instrumental, collective case study (Stake, 2000). It was instrumental because we were interested in the implications of telementoring as an intervention 1) to improve the writing of urban high school students and 2) to enhance the ability of preservice English teachers to respond to and mentor low-performing high school students in writing both expository and narrative text. It was collective because individual cases (each telementor-mentee relationship) shared common characteristics such as all telementors were preservice English teachers and all mentees were Grade 9 high school students, and individual cases were "chosen because it is believed that understanding them will lead to better understanding about a still larger collection of cases" (Stake, 2000, p. 47).

If telementoring served as a viable intervention for improving high school literacy and preservice teachers' competency in mentoring writing then it might result in a meaningful collaborative model.

Prior to describing the study it is important to discuss the contextual variables, particularly the urban context, that impacted the outcomes of this research. Much of the research around telementoring has occurred in contexts that reflect higher socioeconomic status. As mentioned earlier, the relationship between the school's or the system's ability or desire to procure, implement, and support technology and effective infusion of technology into classroom learning and the effectiveness of telementoring is critical. In this study the urban context posed significant and frustrating obstacles to the infusion of technology into this classroom.

## Context

In the urban high school, where the study occurred, technology and technological support were at a premium. Like most public schools in large, urban centers, this high school possessed an antiquated electrical infrastructure, out-of-date or a potpourri of computers, inappropriate network configuration, a lack of up-to-date or useful software, and a central district bureaucracy that could not meet demand due to limited resources. Although there was one dedicated, on-site technology person whose function was to repair and maintain hardware, network and software problems required technology support from central administrative personnel. During the exploratory study, when we were initially having trouble getting the donated, new computers up and running, we were informed that the classroom teacher had already used her "chit" because the computers and Internet access were installed in her room ahead of everyone else. Procuring hardware was a minor problem; maintaining access was a monumental one. Despite having the new, donated computers, persistent correspondence between university partners and school system personnel, an interested classroom teacher and interested students, and committed university faculty and preservice teachers, the economic and social context of this large urban district further exacerbated the stark inequalities that generally exist for students in urban settings. These problems persisted and only succeeded to demonstrate how external variables preclude urban students from reaping the benefits of technology further creating a technological underclass and marginalizing already marginalized students (Dimitriadis & Kamberelis, 1997; Fabos & Young, 1999; Luke & Luke, 1999).

## Participants

### Mentees:

Although 54 students from two Grade 9 classrooms agreed to participate in this year-long study, data were gathered for only 49 students due to issues that are discussed later in the article. All students belonged to the Grade 9 Academy, one of the five small learning communities in a school that serves approximately 1,400 students. Like many other urban high schools, this school serves a diverse population that includes 50% African American and Black, 34% Latino, 9% Asian, and 7% white students. Thirty-percent of participating students were enrolled in Spanish English as a Second Language classes (formerly called bilingual)[2] with an additional 40% speaking languages such as Russian, Hmong, Haitian Creole, Chinese, Cantonese, Somali, Vietnamese, Jamaican, and Portuguese; 19.1% received special education services, and 65% were eligible for free or reduced lunch. The classrooms reflect a rich, ever-changing diversity of culture, race, ethnicity, achievement, learning styles, socioeconomic status, ability, power, and geographic origins. These Grade 9 students received English Language Arts and mathematics instruction in 90-minute blocks. Almost all of the 54 students had received failing or poor scores on high stakes state assessments in English language arts and on Stanford 9 Achievement Tests that were administered in Grade 8. These students were designated by the school system as "transitional" students requiring additional and focused literacy instruction. At least 20% of these students were diagnosed as special needs, and all were "at-risk" for failing the Grade 10 high stakes, state-mandated, graduation assessment requirement. With more than 30 years of both middle and high school teaching experience in English language arts, the classroom teacher was also the school's onsite literacy specialist. As a literacy specialist, she availed herself of professional development opportunities, but functioned from a more traditional teacher-centered instructional approach to literacy instruction. She maintained a well-disciplined and respectful classroom and held high expectations for herself and her students.

### Telementors:

Forty-five (33 undergraduate and 12 graduate preservice English teachers) served as telementors. Undergraduate students were primarily first semester juniors, while graduate students ranged in age from 23 to 50. All students were enrolled in English Secondary Methods, a required course for teaching certification in English Language Arts (Grades 7–12) in a teacher education program at a private university in the Northeast. Undergraduates were pursuing an English major along with certification, while graduate students had already completed a B.A. in English and

were working towards Master's Degrees in English Education and pursuing teaching certification. Telementoring was a course requirement. Each undergraduate mentored one Grade 9 student, while several graduate students were each asked to mentor at least two Grade 9 students. Eighty-five percent of mentors attended suburban public, private, or Catholic high schools and all but 2 graduate students had attended private undergraduate institutions. Almost all mentors had no previous experience working with either urban students or low-performing students in English language arts. Prior to beginning the study, mentors were instructed in methods of process writing, effective ways of teaching writing, characteristics of Writer's Workshop, and useful ways of providing feedback. During the study, a continuous feedback loop between classroom teacher, technology specialist, university professor, and mentors focused responses to student drafts in keeping with time constraints, classroom teacher's needs, and students' needs.

## Telementoring Tool: Mentor Center

Mentor Center, a user-friendly, Web-based telementoring tool developed under the National Science Foundation sponsored National School Network, was used to structure the exchange of writing and feedback between mentees and mentors. Mentor Center's format allows for customized forms for student writing, while also providing space for personal responses (e.g., a "message to my mentor or mentee" that not only contributes to improved writing, but to developing a relationship between the student and the mentor). The student posts and then submits his/her writing through Mentor Center on the Web, and notification automatically is sent to the mentor via an email message. The telementor logs on and sees the assignment, teacher instructions for the assignment, student work, and a space to input mentor feedback. The telementor then posts a response to the mentee, submits it and Mentor Center sends an email notification that there is feedback to the teacher and/or mentee. Mentor Center has features that make it easier to use and more useful than email. For example, Mentor Center archives all correspondence between student and mentor so that the classroom teacher has access to the ongoing dialogue to track student progress and revisions and to offer mentors additional suggestions and advice. This process can facilitate a comfortable, ongoing dialogue among student writer, mentor, and classroom teacher. Mentor Center also offers another advantage in that any material that can be posted on the World Wide Web (e.g., graphics) can also be posted on Mentor Center.

## Figure 1


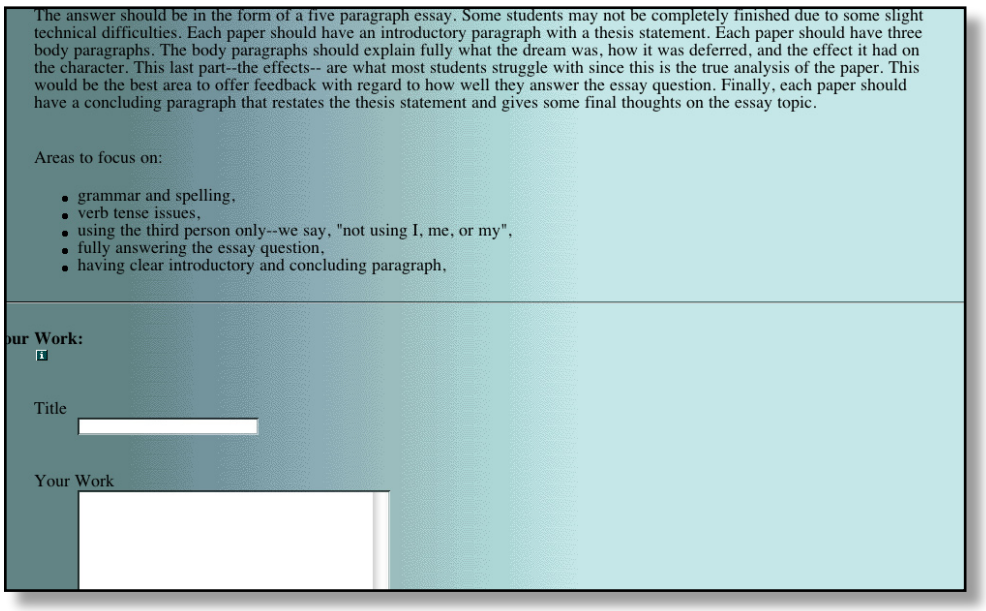


Figure 1. The first screen displays assignments that have been posted, the status of posting, and mentor feedback. The second screen describes the actual assignment and provides a template in which mentees enter their drafts and telementors provide feedback.

## Stages of the Study

This study was comprised of two stages: pre-AlphaSmarts (September 2001 to mid-March 2002) and post-AlphaSmarts (mid-March through May 2002).

### Pre-AlphaSmarts

During the pre-AlphaSmarts stage, the project was plagued by difficulties with technology and lack of technology support, the basic essentials for successful telementoring. Because use of Mentor Center required students to input their text directly on the Web, the teacher had to depend on the 8 donated computers and Internet connectivity in the classroom. During this stage, no more than 4 personal computers worked at any one time to service all 54 students, seriously limiting student access to technology, practice in writing, word-processing, and keyboarding, and the number of complete drafting-submission-feedback-revision cycles for mentees and telementors. These limitations necessitated procuring workable technology that would provide efficient and effective individual student access.

### Post-AlphaSmarts

In mid-March, 25 AlphaSmarts were introduced significantly reversing limitations by providing more individual student access and practice in writing, word-processing, and keyboarding, and more successful completions of drafting-submission-feedback-revision cycles. AlphaSmarts are portable keyboards capable of running basic word processing programs that allow students to compose, edit, cut, copy, and paste text, and perform spell-check. Students input their writing assignment at their table, spell-check it, and then use a wireless connection on a workstation to transmit it to their mentor through Web-based Mentor Center.

## Data Sources and Data Analyses

Data gathered during both stages included all student drafts and telementors' responses for each writing assignment. Several focus interviews between 1 graduate student telementor and her 3 mentees were also included. The interview protocol was semi-structured with the focus toward understanding how the mentee processed feedback from the telementor, how the mentee enjoyed using the technology, and how the mentee perceived writing in general. The telementor was in the classroom as a full-time student teacher, but her mentees did not know that she was their telementor. She conducted these interviews as part of her classroom-based research project. Journal notes, based on observations by the student teacher, documented all classroom students' interactions with technology and telementor feedback as well as the classroom teacher's interactions with the technology and telementoring. The classroom

teacher's written observations, the technology specialist's and the university researcher's field notes of conversations with mentees, telementors, and the classroom teacher, and observations of mentees in the classroom, and email discussions were analyzed as well. Although telementors' reflective essays in response to specific questions about their experiences and growth as writing mentors were collected, these were not analyzed for this study.

Initial and final student writing assignments were evaluated for line count, average number of words per line, numbers of first, second, and third drafts, and incorporation of telementor feedback during revision which delineated feedback that addressed language conventions, content, organization, and style and voice. Telementors' responses were coded for the quality of feedback which broke down into feedback that addressed language conventions, content, style and voice, and organization, whole text feedback vs. focused feedback, the level of language difficulty used while providing feedback, honesty of feedback, and ability to engage students in revision, etc. Exchanges between telementors and mentees were also examined for the characteristics of the mentoring relationship. Initial codes included self-reported comments about writing for mentees and teaching writing for telementors, events that indicated degrees of respect and openness between telementor and mentees, and discussion of issues not related to school or writing.

# Results and Analyses

Although we continually rethought our strategies because of emerging constraints around technology and classroom teacher pedagogy, there were valuable learnings that related to high school student and preservice teacher performance around writing and mentoring. The following discusses quantifiable changes in student writing as a result of introducing computer technology and AlphaSmarts and also addresses several qualitative results that emerged. Analyses are integrated as results are discussed.

## School Culture

The realities of student and school culture impacted and perhaps limited the mentoring relationship. Student attendance, students' lack of keyboarding skills, and issues with technology each affected the development of the mentoring relationship. Tardiness and truancy were major factors and accounted for the decrease in high school participants from 54 to 49. Since many students traveled more than 1½ hours from distant parts of the city to school via public transportation, tardiness, often through no fault of the student, was a serious issue.

Student skills and technology-related issues further exacerbated the seemingly nonproductive student engagement with technology and telementoring during the first stage of the study. Keyboarding skills were minimal or nonexistent as a result of budget cuts that had eliminated computer keyboarding experiences in the middle school. Many students used only two-finger typing. Students' limited typing skills led to students truncating their hand-written drafts when typing, and completing short paragraphs with many mechanical errors, such as missing spaces and punctuation. (Observations/Fieldnotes)

A lack of technology infrastructure posed one of the most significant barriers during this research. During any given week, at best 4 of the 8 new computers in the classroom worked. This dysfunction was most often due to inappropriate network configuration or router connections – problems which could only be remedied through an order from the central office. Viruses, lost files, inability to access the Internet, and incorrect email addresses also served as occasional obstacles. Although laptops would have been a better technology choice, we were not permitted to purchase them because new hardware had to be the same as that already in the school. To improve the dilemma of access, a small group of 6 students used some of the 25 computers in the school's media resource center. But even there, only 8 out of 25 computers were functioning on any given day, and at least 4 were already assigned to students from another class for Internet work. Malfunctioning printers in both the classroom and the library provided another obstacle. Printing out mentors' comments for students would have been a way to get around limited access, but unreliable printers deterred students from timely access to mentors' comments. When administrators became aware of the benefits of the telementoring project, they assigned the technical support person to ensure that the machines were working in the morning and asked this person to be available as needed. But even with this additional support, the majority of the machines did not work due to incompatibilities with the district's network configuration. Technology-related obstacles presented themselves at every point in the process.

These factors prevented a more thorough development of relationships between college and high school students as they were not afforded time to establish a more genuine rapport as well as trust with each other. Since only a few computers worked during each session, we had to limit the amount of time students could spend at the computer in order to give as many students as possible a turn. Limited access neither afforded students opportunity to improve keyboarding skills nor benefit from drafting on the computer. Therefore, entering drafts on the computer was an arduous process that was further exacerbated by the lack of availability and access to hardware.

Issues of educational mismatching and the school system itself were probably also culpable in limiting the productivity of the mentoring process. Many students were products of instruction that demanded right answers, accurate mechanics, and correct structure – pedagogy that disallowed experimentation and constructivism – methodology that forced students to get bogged down in spelling words correctly rather than sharing ideas and brainstorming content. Lack of human and material resources, fluctuating class size due to transience, and a high stakes assessment that held students accountable to standards that were often culturally, academically, and linguistically insensitive also contributed to the school system's unintentional subversion of academic achievement (Comer, 1988; Davies, 1989). What further complicated this problem was the students' inability and lack of time to value the process of reviewing and assimilating telementors' feedback as they wrote new drafts. Because students did not have time to review mentors comments, the very process that could have enhanced engagement and improve student writing was diminished without the potential gains for student improvement.

Relief from the constraints of limited access and unreliable computers came in March 2002. The immediate improvements were remarkable for both the teacher and the students. With AlphaSmarts, management of the technology was generally easier and less time consuming for the teacher. Equipment preparation for class was just a matter of handing out the AlphaSmarts rather than struggling with malfunctioning computers. And in terms of class time, students no longer needed to rotate computer use in 10 minute increments. Perceiving the AlphaSmarts as rewards, students were suddenly excited about writing. Students quickly learned to use these basic keyboards, and were given a sense of mastery and accomplishment. Students entered work on AlphaSmarts, at their desks while waiting for a free computer. This resulted in a more efficient use of student time and fewer disruptions. Since each classroom generally contained no more than 25 students, the 1:1 AlphaSmart to student ratio encouraged a greater sense of ownership, responsibility, independence, and empowerment in students.

## Student Products: Writing Pre- and Post-AlphaSmarts

During the study, there were two assignments that required several drafts and revision: the first essay based on *Of Mice and Men* (pre-AlphaSmart) and the second based on *Romeo and Juliet* (post-AlphaSmart). During the pre-AlphaSmart stage, of the 49 students, 15 did not submit any drafts, 27 submitted only a first draft, and 7 submitted two drafts. The average number of lines for the 34 first drafts was 6.5 lines with an average of ~15 words per line. The average number of lines for the 7 second drafts

was 11.5 still averaging ~15 words per line. Drafts were replete with grammatical, punctuation, and spelling errors. This was expected because students a) were encouraged to get their thoughts down on paper rather than worry about language conventions and b) had limited or no keyboarding skills.

Increases in productivity indicated by number of drafts and number of lines per draft were observed in the assignment for *Romeo and Juliet* which was completed in the second stage, post-AlphaSmarts. Of the 49 students, 8 did not submit any drafts, 5 submitted only a first draft, 32 submitted two drafts, and 4 submitted three drafts. The average number of lines for 41 drafts was 24.0 with ~15 words per line. The average number of lines for second drafts was 28.8 lines, and the average for third drafts was 30.5 lines. Table 1 indicates the number of students submitting various drafts for each product and Table 2 indicates the average number of lines per draft for each product.

**Table 1** **Number of Students Submitting Either One, Two, Three or No Drafts for Each Assignment Pre-and Post-AlphaSmarts**

| | ***Of Mice and Men*** Pre-AlphaSmarts (n=49) | ***Romeo and Juliet*** Post-AlphaSmarts (n=49) |
|---|---|---|
| Submitted no drafts | 15 | 8 |
| Submitted only one draft | 27 | 5 |
| Submitted two drafts | 7 | 26 |
| Submitted 3 drafts | 0 | 9 |
| Submitted 4 drafts | 0 | 1 |

**Table 2** **Average Number of Lines per Draft Pre- and Post-AlphaSmarts**

| | Pre-AlphaSmarts | Post-AlphaSmarts |
|---|---|---|
| Average number of lines per draft | 6.5 | 24.0 |
| Average number of lines per 2nd draft | 11.5 | 28.8 |
| Average number of lines per 3rd draft | | 30.5 |

## Increased Focus on Revision

Prior to the introduction of AlphaSmarts the process of reviewing and assimilating telementors' feedback as students wrote new drafts was minimally valued. The student teacher/researcher noted the following during a conversation:

> *The students who get to use the technology are excited about using it. They don't seem to take the feedback seriously, however. Also there is too much of it. Trying to see that everyone writes and submits a draft just takes up too much time. Ms. T. (the cooperating teacher) wants to move on and is not requiring students to incorporate feedback. I try to help students review telementors' comments, but there is no time and I cannot get to everyone. Besides not everyone gets a chance because not everyone has submitted a draft because not all the computers are working. Some kids are just such slow typists. They need more practice. This is nuts!*
> *(Interview: 2/4/2002)*

With the AlphaSmarts, first drafts became longer, richer, and in many cases existed where there was no attempt before. What was of major significance, however, was how AlphaSmarts changed the efficiency of writing and submitting drafts and thus allowed more time for the student and classroom teacher to help students process comments and incorporate feedback.

> *The AlphaSmarts are giving the kids much more practice writing so they are getting better at typing. The process is becoming more efficient as kids are writing and submitting to their mentors. Ms. T. and I have more time to spend with students to help them revise their drafts based on the feedback they are getting so they are becoming more able to incorporate feedback into their second drafts.*
> *(Follow-up conversation: 4/27/2002)*

There were also notable behavioral differences. With not enough computers to go around, many students tended to socialize rather than write, thus submitting no first draft or drafts with few lines. With the change to AlphaSmarts, one student, prone to chatting and walking around the room, completed her writing assignment immediately and then coached her peers not only in using the AlphaSmart but also in composing. The AlphaSmart became a vehicle for this student to transform her social skills in a positive way. She not only demonstrated academic competence, she also transformed her boredom and misapplied social behavior into a productive, mentoring role. The technology allowed us to see another side of this student that the typical classroom context had masked. Students regarded the AlphaSmarts as a reward and commented enthusiastically about "having a computer of their own" (Observation/Fieldnotes).

Other benefits emerged. In the past, students' slow typing gave them little time to use supports like spell-checker and grammar assistance. Now low-performing students could review highlighted mistakes in the spell-checker and grammar-checker and for the first time recognize conventional errors. Being easier to manage, the teacher used the AlphaSmarts more often and gave students more time writing. And with every student working on the same activity at the same time, both teacher and student teacher were better able to work individually with students.

## Developing Telementoring Relationships

### Honesty and Trust

Honest and trusting relationships between telementors and mentees emerged as important. Even during introductory exchanges, high school students were excited about working with college students to improve their literacy skills. Initial instructions asked mentees "just to type in your name, your class, and a question you would like to ask your mentor." The following sample exchanges are representative of not only a demonstrated motivation to tackle writing and to develop an online relationship, but also an honesty about mentees' writing abilities and telementors' abilities to mentor in writing. (All names are pseudonyms.)

*Carlita and Katherine:*

> Hi. My name is Carlita Marie Gonsalez. I'm 15 years old and a freashman at Burbank High School.I can use some help with my writing because I need help deciding what to write ... I would like to know what your hobbies. What is your background? Is being a mentor hard?

Like Carlita, telementor Katherine shares something about herself:

> *I am originally from Taiwan, an island just off the coast of China, but I grew up in Southern California… As a young child, I spoke only Chinese and had to quickly learn English in order to catch up with my American classmates.* [Yet, despite her mentor status Katherine also writes about being a competent mentor:] *I think the hardest part of being a mentor will be trying to make sure I don't make any mistakes myself. Writing is a skill that requires continual efforts, and as you get older, you will find that learning to communicate is actually a lifelong process. I am excited that this will be a learning experience for both of us.*

*Joe and Mita:*

> Hi my name is Joe Hernandez. I am 14 years old and a freshman at Burbank High School. I can use some help with my writing because sometimes i dont understand the assignment. I want to ask you what kind of sport you like to play or see. i want to know what kind of food you eat. i want to ask you where you from I want to know where you live now. the last thing that i want to ask you that how did you take this type of job what carrer you chode for this.

Mita first addresses Joe's concern about "understand[ing] the assignment":

> *I have also found that it is difficult to complete an essay effectively when you do not understand the directions. I hope that, together, we can work on strategies to help you understand the best approach for "you" when it comes to this type of writing. I say together, because the ideas and suggestions you have will help me, just as the ideas I have will hopefully assist you in this process…* [Mita then shares her excitement about "moving to a new state"… "returning to Atlanta, GA to teach." She explains her reasoning:] *because she "think[s] it would be cool to make a difference in the place that made such a dramatic difference in my life… I also cannot wait to get back to Atlanta, because I miss the food. Soul food is my favorite type of food and I have not been able to find a "good" soul food restaurant in this city. If you know of any, please let me know.*

These exchanges represent the quality and kind of communication that occurred during the first interactions and throughout the project. Although not required, all mentees mentioned their ages and indicated the kind of help they wanted with their writing. High school students were interested in exploring this technology-based relationship and accepted its potential for improving literacy. Mentees discussed plans and dreams, asked personal questions, and identified strengths and weaknesses in their writing.

Comfortable with technology, instant messaging, emailing, and submitting work online, college students enjoyed communicating and shared personal information. Answering questions with details, alluding to cultural backgrounds and language differences, and sharing music and food preferences suggest that preservice teachers were using discourse to create personal profiles and to establish personal connections with mentees. What consistently pervaded telementors' introductory comments are references to "learning from each other" and concerns about being competent writing teachers. It is possible that the distance created online rather than face-to-face allowed such honesty to emerge.

Occurring much later in the academic year, the following exchange poignantly reflects the honesty and trust that developed in a mentoring relationship. In explaining why she had not submitted work to her telementor, Tatinia wrote:

> I know i have alot of explaining to do, I am so truely sorry i having been writing but its just that i've been apsent and i been off track, but now i am back and i am going to get as much done as i can. Please don't hate me. By the way how you bee? Me i've been fine. I think this book of romeo and Juliet is some what hard because of the different scriptures. bye, and hope to here from you soon… …

Her mentor Cathy responded:

*Hi Tatinia! It's good to hear that you are back on track. I was worried when I did not hear from you and when I didn't get any of your work to review. I checked with my professor to make sure that you were all right.*

*I know the language in Romeo and Juliet is difficult, but keep at it. Your goal should be to make this the best essay you've written, so please continue to work hard. I promise I will work hard on my end.*

*I look forward to seeing your next draft.*

The exchange suggests that Tatinia not only values Cathy's support in writing, but also more importantly their relationship. Tatinia wants Cathy to know "that [she] is back and is going to get as much done as [she] can," that she is concerned about "how [she] bee," but doesn't want Cathy to "hate" her. It is important for Tatinia to know that Cathy still cares for her. Tatinia, like many high school students, equates school success with adult acceptance. Not doing work intimates that she might not be a good student, and the logical consequence is that her telementor must "hate" her. Tatinia also alludes to the difficulty of language or "scriptures" in the play implying that both absenteeism and the complex language of the text itself are deterrents to her academic success. It also suggests that Tatinia might have observed text structure similarities between religious scripture and Shakespeare which denotes that Tatinia has observed sophisticated levels of discourse based on the similarity of the language structures in scripture and Shakespeare. It is important to note that Tatinia finds this online relationship safe and supportive enough to raise issues of absenteeism and text difficulty and other personal issues that influence Tatinia's learning and academic achievement. Furthermore, computer-mediated communication offered Tatinia a context where she could have "control over the substance and process of the interaction" (Harasim, 1990, p. 51). This allowed her a safe context in which she could discuss her difficulties in school and share her somewhat sophisticated observations about syntax, something that she might have felt awkward discussing in class. Exchanges throughout the year indicated that both telementors and mentees regarded the online partnership as real and mutual with a genuine potential for learning, caring, and growth.

## Reading Between the (On)Lines

Perplexing in a different way, several experiences prepared preservice teachers for the more serious, affective issues related to working with adolescents. Online conferencing can make it possible for students to reach beyond their own community and to talk to people they would not normally have access to. High school students began to trust and look forward to talking to mentors resulting in what Sproull and Kiesler call second level

effects or effects "that lead people to pay attention to different things, have contact with different people, and depend on one another differently" (in Harrington, 1993, p. 13). This type of relationship was clearly apparent in the previously cited exchange between Tatinia and Cathy. Another telementor who was also a student teacher in the mentees' school, detected subtleties in the online conversations that raised concern about the student's emotional and social well being. He consulted his professor, and subsequently, the classroom teacher who was able to intervene in a sensitive and appropriate manner.

Undergraduate mentors raised issues of boundaries during course time. Not much older themselves, mentors found the line between teacher, mentor, and friend somewhat fuzzy – a line that is especially difficult to negotiate for novice high school teachers. Slowly they learned how to be supportive and understanding while maintaining their "authority-like" position.

## Providing Effective Feedback

Initially, all telementors experienced difficulties providing effective and useful feedback. Trained in a workshop style, they posed extensive feedback to students in the form of questions seeking clarification and elaboration of content in order to aid writers in developing their ideas. Additionally, telementors intuitively used college level, English language usage, but mentees' vocabulary and reading development were often not sufficient to understand mentors' comments. This emerged as a central problem when revised assignments reflected minimal incorporation of mentor's feedback. Telementors often received second drafts that were no different from the first drafts. After receiving a second draft that was not noticeably different from the first draft, one telementor responded as follows:

> *Shanisha,*
>
> *As I said before, this looks like the making of a good essay. I am not sure that you have incorporated any of the suggestions from my previous message to you (which is fine), but we do need to work on structure and adhering to the guidelines for this type of essay.*
>
> *Your introductory paragraph does a good job introducing the reader to this text. Is it possible that after you discuss the family and their dreams being deferred, that you could focus on how not having "enough money to complete their dreams" affected the characters you discuss? You can focus on their not having enough money, then support it by their frustration. Another focus would be on the anger, with the lack of money as a supporting detail. I believe that if you approach it this way, you will have smoother transitions between your paragraphs.*

*After your paragraph about Mama wanting a better life for her family, you could possibly transition into your next paragraph by explaining how Walter Lee, Jr. planned to bring about a better life for the family. Yes, owning a liquor store was his dream, but tell your reader why. Was it a dream that he's had since a little boy, or is it a dream that he recently thought of in order to make money for the family?*

*You have some really good ideas here Shanisha, but we've got to find a way to make them work all together. Until next time, take care and continue to work hard.*

*Allison*

Allison raises valuable questions about cause and effect, elaboration, and organization, but the feedback is too much for Shanisha. Language like "structure," "adhering to guidelines," and "transition into" may not have been part of the writer's vocabulary. Even the best of writers might experience difficulties addressing all these concerns at one sitting. Instruction during college class time emphasized providing limited, manageable, and targeted feedback using student drafts. As the year progressed, telementors learned to offer feedback in appropriate language, limiting critique to two or three important ideas, and noting errors in punctuation, spelling, and grammar. Although mentors learned how to make better decisions about the language and feedback they offered, they also had great difficulty knowing which comments were perceived by students as most helpful. Strike (1991) noted that computer conferencing nurtured college students' professional development in that it forced students to identify the information they needed to make their own decisions rather than seek expertise from authority. Eventually, telementors learned how to provide appropriate feedback without relying of instructor's input or suggestions; telementoring helped them hone their abilities as teachers of writing. Subsequent feedback became similar to the following examples.

*Richard,*

*I think you have some very good ideas here. I especially like how you have included quotations to support your ideas. I have a suggestion about writing mechanics. Capitalize the first letter of each sentence. Capitalize the names of people and the names of places (proper nouns).*

*The body of your paragraph is very good, Richard. How can you introduce your essay so that your reader knows the question you are answering? Can you restate the question in a sentence or two to set the stage for your ideas? How can you conclude your essay?*

*Very good start, Richard.*

*Andrew*

## Attending to Revision

AlphaSmarts provided practice that enhanced students' keyboarding skills as well as provided students more time on writing. As a result, the graduate student and her cooperating teacher were more able to restructure writing time so that students could discuss and reflect on mentor feedback before revising drafts.

The instructions for the final assignment of the year were as follows:

> In a well-constructed paragraph, respond to the following prompt. Be sure to have a clear topic sentence. Include 2 to 4 detailed sentences, examples from the text of the play, and a strong concluding sentence. Discuss one of the following types of love and how the characters in the play represent each type: unrequited, romantic, parental, friendship, and love of family honor.

Students' second and third drafts had to demonstrate that they had addressed telementors' feedback. The following demonstrates Nancy's first through fourth drafts.

**Nancy's 1st Draft**

In the play Romeo and Juliet, written by William Shakespeare, takes place in Verona, Italy. The three types of love that are most important in the play are Romantic, Unrequited, and Family Honor love.These three loves play a big role in the play,and they appear various times in the play. Romeo had Unrequited love for Rosaline.Family honor love is a big aspect in the play, and Romantic love plays a big part in the play.

Unrequited love is when you love someone and they do not love you back. For example a type of unrequited love is Romeo and .Romeo loves Rosalllin but Rosalin does not love him back. When they broke-up Romeo was all emotional about it and Rosiland was acting like she really did not care. Unrequited love is a type of love that i never experienced and want to experienced.

A type of Romantic Love is Rome & Julie. I think romantic love is when you love someone and you know for a fact that they love you back.It was on vious that Romeo and Juliet was meant to be together, because whent hey first met eachother they automatically fell inlove like they had sometype of chemistry between one another.

Love of Family Honor is a big aspect of the play. The Montagues and Capulets care deeply about there families. For example Tybalt is so outstandly caring about his family that it caused his life to end in death. H also ended the life of Mercutio who is part of the Montague family.For example "with piercing steel at bold Mercutio's breast", In the play Romeo and Juliet Family Honor ends in tragedy.

(Boldface **type** indicates first attempt at revision.)

| **Marion's Response to Nancy's 1st Draft** | **Nancy's 2nd Draft** |
|---|---|
| *Nancy,*<br><br>*I'm sorry I didn't get back to you sooner, but I didn't check my email until last night. Please forgive me!*<br><br>*The first sentence is strong clearly stating the name of the play, the author, and setting. Delete the first word "In," however, and the sentence will be grammatically correct. Also, the title should be in quotation marks and the three types of love do not need to be capitalized.*<br><br>*You have chosen to discuss all three kinds of love, but the question/prompt asks you to choose only one and discuss it. I like your paragraph about unrequited love the best, but you also do a good job with family honor.*<br><br>*As far as organization goes, your essay is well-organized. You state the three types of love and then you discuss each one in the following three paragraphs. Again, I would suggest that you choose one and talk about it using detail and support from the play because that is what the assignment calls for. Good luck!!* | **The play "Romeo and Juliet",** written by William Shakespeare, takes place in Verona, Italy. The three types of love that are most important in the play are **romantic, unrequited, and family honor** love.These three loves play a big role in the play,and they appear various times in the play. Romeo had unrequited love for Rosaline. Family honor love is a big aspect in the play, and romantic love plays a big part in the play.<br><br>Unrequited love is when you love someone and they do not love you back. For example a type of unrequited love is Romeo and.Romeo loves Rosalin but Rosalin does not love him back. When they broke-up Romeo was all emotional about it and Rosiland was acting like she really did not care. Unrequited love is a type of love that i never experienced and never want to experienced.<br><br>A type of Romantic Love is Rome & Julie. I think romantic love is when you love someone and you know for a fact that they love you back.It was on vious that Romeo and Juliet was meant to be together, because **when they** first met eachother they automatically fell in love like they had sometype of chemistry between one another.<br><br>Love of Family Honor is a big aspect of the play. The Montagues and Capulets care deeply about there families. For example Tybalt is so outstandly caring about his family that it caused his life to end in death. He also ended the life of Mercutio who is part of the Montague family.For example "with piercing steel at bold Mercutio's breast", In the play "Romeo and Juliet" Family Honor ends in tragedy.<br><br>**In conclusion, Romeo and Juliet's love came to an end do to their love for each-other. There love was so strong for each-other that they was willing to die for each-other, but instead they died together. In the end there families finally forgave each-other after years of family feuding. Romeo & Juliet is a true love story, their love for each-other was undying, but sadfully it ended in tragic death.** |

From first to second draft, the number of lines in Nancy's writing increases from 18 to 23. Though it appears that Nancy was just observing effective organization by adding a conclusion to her essay, it is possible, however, that AlphaSmarts facilitated her efforts. She does make two small changes Marion suggests, but these focus on mechanics. Nancy does not address Marion's suggestion to "choose one [type of love] and talk about it using detail and support from the play because that is what the assignment calls for." Overall, students incorporated revision of mechanics into drafting because it was easy and concrete, and resulted in correctness. Modifying, generating, and supporting ideas and restructuring text, on the other hand, are both time and thought consuming as well as abstract, resulting in changes that may not be "correct." Such revision requires additional thought and effort, work that challenges already challenged writers.

It is not until Nancy's third draft that she begins to tackle the tougher issues in her writing like adding details and textual support. In the third draft, Nancy incorporates cited textual support for unrequited and romantic love. During this revision, she ignores feedback about the spelling of Rosalyn's name, but changes "on vious" to obvious, "was" to were, capitalizes "Their," spells Juliet correctly, and adds a period after "story." Like Nancy, novice and veteran writers need time to process feedback in order to revise their writing. Nancy quickly "fixes" the mechanics that she knows will be "right," and then addresses the more difficult and thoughtful focus of elaboration and support. Nancy has also made additional editing changes like separating "each other." Although a more formal analysis is needed, it is likely that such editing changes emerged as a result of the SpellCheck option on AlphaSmarts.

(***Italicized boldface*** indicates second attempt at revision.)

| **Marion's Response to Nancy's 2nd Draft** | **Nancy's 3rd Draft** |
|---|---|
| *Nancy,*<br><br>*Your paragraph organization is perfect! I really like your concluding paragraph because you give the reader something extra that you've noticed: the irony of Romeo and Juliet's undying love for each other was the cause of so much tragic death in the play.*<br><br>*A few comments: Check the spelling of Rosalind. You spell it three different ways in your essay. Also in paragraph 3, you spell Rome and Julie instead of Romeo and Juliet. Also in the 3rd paragraph, line 2, I think you mean "obvious" and the verb should be "were" instead of "was" because the subject "Romeo and Juliet" is plural.*<br><br>*The last suggestion is for your final sentence. I would put a period after "Romeo and Juliet" is a true love story. Make sure you quote the title and capitalize the word, "Their" as the start of a new sentence. Good luck with your next draft. Keep up the good work.* | The play "Romeo and Juliet", written by William Shakespeare, takes place in Verona, Italy. The three types of love that are most important in the play are romantic, unrequited, and family honor love. These three loves play a big role in the play, and they appear various times in the play. Romeo had unrequited love for Rosaline. Family honor love is a big aspect in the play, and romantic love plays a big part in the play.<br><br>Unrequited love is when you love someone and they do not love you back. For example a type of unrequited love is Romeo and Rosaline. Romeo loves Rosalin but Rosalin does not love him back. When they broke-up Romeo was all emotional about it and Rosiland was acting like she really did not care***. [I.i.202] "In sadness cousin I do love a woman." I think Romeo is saying that instead of him being happy about loving a woman, he is sad because he is not receiving the same love in return.*** Unrequited love is a type of love that ***I*** never experienced and never want to ***experience.***<br><br>A type of romantic love is Romeo & ***Juliet***. I think romantic love is when you love someone and you know for a fact that they love you back. It was ***obvious*** that Romeo and Juliet ***were*** meant to be together, because when they first met each other they automatically fell in love like they had sometype of chemistry between one another. ***"O Romeo, Romeo! Wherefore art thou Romeo? Deny thy father and refuse thy name; Or it thou shall not, be but sworn my love, and I'll no longer be a Capulet." That she will actually change her royal name for love.***<br><br>Love of family honor is a big aspect of the play as well. The Montagues and Capulets care deeply about there families. For example Tybalt is so outstandly caring about his family that it caused his life to end in death. He also ended the life of Mercutio who is part of the Montague family. For example "with piercing steel at bold Mercutio's breast", Mercutio says this to Romeo while he is dying. In the play "Romeo and Juliet" family honor ends in tragedy.<br><br>In conclusion, Romeo and Juliet's love came to an end do to their love for ***each other. Their*** love was so strong for each other that they were willing to die for ***each other,*** but instead they died together. And in the end there families finally forgave ***each other*** after years of family feuding. "Romeo & Juliet" is a true love ***story.*** Their love for each other was undying, but sadlly it ended in tragic death. |

**Underlined boldface** indicates third attempt at revision.

| Marion's Response to Nancy's 3rd Draft | Nancy's 4th Draft |
|---|---|
| *Nancy,*<br><br>*Your essay just keeps getting better and better! I really like the quotes you chose for unrequited and romantic love, and that you followed them with an explanation of what you think they mean – excellent!!! Mercutio's quote isn't quite so strong, but maybe it just needs you to explain what you think it means in the context of family honor.*<br><br>*There are still a few spelling and punctuation issue to be corrected in the final edit, but the flow and content are good. Check your use of "there" and "their" and make sure you are using "there" to mean a place and "their" to denote ownership. For example, in paragraph 4, sentence 1, "…care deeply about there families" should read "their families." The spelling of Rosaline in paragraph 2 is still inconsistent.*<br><br>*Good luck with your final. Remember that it's the content and organization of your writing that is really important and you are there with this essay. The mechanics will come with practice and the help of a good editor!* | The play "Romeo and Juliet", written by William Shakespeare, takes place in Verona, Italy. The three types of love that are most important in the play are romantic, unrequited, and family honor love. These three loves play a big role in the play, and they **reappear throughout** the play. Romeo had unrequited love for **Rosalyn**. Family honor love is a big aspect in the play, and romantic love plays a big part in the play.<br><br>Unrequited love is when you love someone and they do not love you back. For example a type of unrequited love is **between** Romeo and Rosalyn. Romeo loves **Rosalyn** but **Rosalyn** does not love him back. When they broke-up Romeo was all emotional about it and **Rosalyn** was acting like she really did not care**.** [I.i.202] "In sadness cousin I do love a woman." I think Romeo is saying that instead of him being happy about loving a woman, he is sad because he is not receiving the same love in return. Unrequited love is a type of love that I never experienced and never want to experience.<br><br>A type of romantic love is between Romeo & Juliet. I think romantic love is when you love someone and you know for a fact that they love you back. It was obvious that Romeo and Juliet were meant to be together, because when they first met each other they automatically fell in love. **They had** some type of chemistry between one another. "O Romeo, Romeo! Wherefore art thou Romeo? Deny thy father and refuse thy name; Or thou shall not, be but sworn my love, and I'll no longer be a Capulet." That she will actually change her royal name for love.<br><br>Love of family honor is a big aspect of the play as well. The Montagues and Capulets care deeply about **their** families. For example Tybalt is so outstandly caring about his family that it caused his life to end in death. He also ended the life of Mercutio who is part of the Montague family. For example "with piercing steel at bold Mercutio's breast", Mercutio says this to Romeo while he is dying. In the play "Romeo and Juliet" family honor ends in tragedy.<br><br>In conclusion, Romeo and Juliet's love came to an end do to their love for each other. Their love was so strong for each other that they were willing to die for each other, but instead they died together. And in the end **their** families finally forgave each other after years of family feuding. "Romeo & Juliet" is a true love story. Their love for each other was undying, but **sadly** it ended in tragic death. |

In the final draft, Nancy finally addresses the spelling of Rosalyn, but ignores Marion's comment: "Mercutio's quote isn't quite so strong, but maybe it just needs you to explain what you think it means in the context of family honor." Nancy may not have revised this paragraph for several reasons. She may have forgotten, run out of time or liked it the way it was or needed more focused help relating the act of killing to defending love of family and family honor. Another possibility is that she remembered Marion's initial comment: "I like your paragraph about unrequited love the best, but you also do a good job with family honor." Like most novice writers Nancy may have thought: "Yes! She really likes my paragraph about unrequited love so I'm done with that. And she thinks the family honor part is good too so I don't have to worry about that paragraph either." She then proceeded to work on a different part of the essay. Interviews with several students revealed that this was often the case. Positive feedback tended to reinforce initial drafts even though they needed additional revision.

Nancy exhibited a good sense of essay structure and paragraph development. Personal connections to the theme made her style somewhat engaging. Compared to many of the students in this study, Nancy was attentive in class, completed assignments in a timely manner, revised consistently, and interpreted text accurately. Most likely she believed Marion's initial comments and decided to devote her energy to areas that, in her mind, truly needed revision.

## Effective and Honest Feedback

Students incorporated revision of mechanics because it was easy and concrete, and resulted in correctness. The more difficult revision of modifying, generating, and supporting ideas and restructuring text which takes time, thought, and can result in changes that may not be "correct." This leads to the critical importance of appropriate, effective, and honest feedback. Harrington (1993) observes that telementors' comments can be confusing to challenged writers; thus, they need time to discuss comments with a competent writer and to process suggestions for revision. Initially when the classroom teacher did not require revision due to time and technology constraints, the majority of students submitted only one poor or failing draft and generally ignored telementors' comments unless they addressed spelling and grammar, concrete foci that are easy to fix. As in other research, the style of teacher discourse had a significant impact on student response (Ahern, Peck, & Laycock, 1992).

Most preservice English teachers possess two mindsets about teaching writing. Some, with red pen in hand, heavy-handedly mark every grammar, punctuation, and spelling error, changing words and sentences in efforts

to teach students to write like themselves. Others concerned with writer's self-esteem and eager not to discourage challenged writers, nurture idea development but often err on the side of erroneously praising everything the student does, ignoring errors in grammar, punctuation, and spelling or shying away from the more difficult issues of helping students support theme analysis with text and elaboration. Good feedback requires a balance of nurturing effective idea development, organization, and mechanics, helping students develop a personal style and voice, while keeping students motivated and engaged about writing. What novice writers need is an honest cheerleader – someone who praises the winning plays, carefully identifying the parts of the play that made it successful, while acknowledging the areas that need practice and rethinking. Generally, Marion was an honest cheerleader, but needed to be more accurate in her praise or to pose questions that challenged Nancy to revise her paragraph.

Telementors eventually became more adept at providing useful feedback, but more often than not, students submitted work that needed so much revision that identifying the most important foci proved to be a major challenge. While most learned how to focus feedback on 2–3 areas or provide 1–2 suggestions around content, organization, and mechanics, several still provided too many comments or comments that were too general.

## Barriers to Effective Revision

The graduate student teacher was in a unique situation. She was not only a telementor, but also a student teacher in the classroom. Her comments echo the reflections of the other telementors but also offer insights into some of the problematic issues of the program.

> *Joseph's assignment for week #1 was the only assignment he submitted over the course of the four weeks. His paragraph was reminiscent of all of his previous writing assignments. It was incoherent and unfocused. Determining a focal point on which I could comment was extremely difficult. I decided to focus on three areas in his writing that could later be applied to this essay, his revision and other writing assignments: 1) developing ideas, 2) textual support, and 3) organization. Although his paragraph was sub par, I continued to encourage his efforts (for lack of better terms) by telling him that "… I thank you for your hard work and I look forward to seeing your revision. If you have any questions about my suggestions… let me know.*
> *(Journal Entry and Online Exchange)*
>
> *Because he did not complete the next three telementoring assignments, we spent in-class time integrating the suggestions into his writing. I found it difficult, working as Joe's student teacher, to refrain from*

> *integrating any suggestions into his writing other than those submitted on Mentor Center. Specifically, it was difficult for me transport myself to the role of facilitator; especially since I was also his mentor. I believe that more progress and improvements could have been made in his writing, but he was not committed to the program. He took all of the suggestions we discussed during our conference and integrated them into his paper: word for word. It does appear as though he even considered how incorporating the mentor's suggestions could improve his essay. When interviewed, however, he told me that he did not see how the program was helping him. He went on to say, "I don't see why we have to do this anyway… but thank you for your help." (Interview/Fieldnotes)*

Incorporating or at least considering telementors' suggestions during revision is an essential part of improving writing. Although incorporation was required, a few students like Joseph did not see the value of it. Joseph also had a history of absenteeism and not completing work. When the student teacher sat with him and discussed the same comments she had provided as his telementor, he integrated suggestions into his draft; yet, he ignored those same suggestions when he perceived they originated from his telementor. Joseph also never connected that the student teacher and the telementor were the same person. It seems that Joesph valued and was motivated to work when in a physical, one-to-one relationship, but perhaps did not value or may have been intimidated by the telementoring relationship. Also Joseph did not truly understand the purpose of feedback as fodder for improving his writing nor was he committed to the program. This may have been due in part to not understanding the cycle of feedback and revision and the program itself. All are disadvantages common to telementoring programs (Harrington, 1993).

The student teacher observed other issues at play: "low literacy due to excessive absenteeism during his previous and current school career and failure to complete any assignment unless the teacher was standing over him" (Interview). Since Joseph is not unlike many of his peers, these issues merit serious consideration when establishing a technology-based program in writing.

# Implications: Lessons Learned

Several important lessons emerged from this research that address 1) difficulties of the urban context; 2) the effectiveness of telementoring in improving writing literacy; 3) importance of preservice teachers learning to provide effective feedback; and 4) the affective component of online mentoring.

## The Urban Context

Telementors experienced, first hand, the social context of urban schools such as limited resources, minimal or nonexistent typing skills, excessive absenteeism, demanding out-of-school responsibilities, tardiness, low self-esteem, self-fulfilling prophecies of failure, etc. Despite ongoing technology issues, the classroom teacher slowly integrated technology use into her writing program and students became more comfortable with word processing and submitting on line. AlphaSmarts entered the study at a critical point, allowing each student ongoing and individual access to an effective technology tool, serving as valuable incentives for writing at a time when student interest was beginning to wane. This evolution, however, further clarified issues of disenfranchisement of urban students due to the absence of usable and useful technology to support teaching and learning. A lack of technology infrastructure, inappropriate wiring, incompatible software, malfunctioning printers, untimely maintenance and repair, and urban school system bureaucracy worked concertedly to defeat progress. AlphaSmarts entered the study at a critical point, allowing each student ongoing and individual access to an effective technology tool, serving as valuable incentives for writing at a time when student interest was beginning to wane. The economic and social context of this large urban district further exacerbated the stark inequalities that generally exist for students in urban settings. Cuban (in Sandholtz, Ringstaff, & Dwyer, 1997) notes, a major purpose of schools is to "help students learn the system, gain access to what a democracy offers, and achieve an adulthood that will both contribute to and improve the community" (4). Carefully structured and supervised technology use and appropriate online mentoring can give students better access to more accurate information and informed perspectives that can lead to better decision making and judgment. Although technology can help youngsters access what democracy offers, it must be available to *all* youngsters. Despite the benefits of technologically enhanced instruction, most American public school students spend less than one hour weekly at the keyboard (Cuban in Sandholtz et al., 1997). The number is lower for students in urban high schools where technology support is at a premium (Means, 2000). Without the AlphaSmarts the prognosis would have been grimmer and perhaps fatal.

Although online learning can radically alter the very nature of education, providing quality education to all students, the realities of working within urban centers undermine and reinforce the inequities of power and context that influence and control the role and decision-making related to technology in schools (Fabos & Young, 1999; Heath, 2002; Ravitz, 2002).

Even now as we continue this research with new high school students, we are constantly battling infrastructural and bureaucratic obstacles. We have attempted to remedy this by providing additional hardware and more onsite support.

## Telementoring and Literacy

AlphaSmarts entered the study at a critical point providing enhanced access that increased practice in writing to a real and interested audience and generally changed mentees' writing habits and attitudes (Nellen, 2001; Patterson, 2001; Schank, 2002; Schwartz et al., 1989). Number of drafts, overall draft submissions, and number of lines increased (Nellen, 1999). Writing on the computer rather than by hand increased the amount of writing as well as the extent to which students edited (Dauite, 1986; Etchinson, 1989; Russell, Bebell, Cowan, & Corbelli, 2001b; Vacc, 1987). Generally, this in turn led to higher quality writing for many of these students who were special needs and identified as potential failures on high stakes assessments (Bryson & Scardamalia, 1991; Dalton & Hannafin, 1985; Roschelle et al., 2000; Russell et al., 2001a, 2001b; Williamson & Pence, 1989). Telementoring began to change writing instruction in the classroom and the writing habits of engaged students (Schwartz et. al., 1989) offering more time for writing which allowed more attention to feedback. Mentors provided a real audience and context for writing (Nellen, 2001; Patterson, 2001; Schank, 2002). Students eventually paid more attention to the constructive criticism that came from mentors and became more willing to listen and incorporate critique into their work. Telementoring provided students an authentic learning context for improving writing achievement (Means, 2000; Means et al., 2001). Students received more individualized attention that nurtured the most successful performance of complex skills. As students became comfortable with the drafting-submission-feedback-revision cycle, the writing focus moved from teacher-centered to process and student-centered. Students assumed more responsibility for improving their writing as indicated by increased number of drafts and a higher degree of incorporating feedback into revision.

Alphasmarts had a significant impact on the teacher's ability to use technology with her class. Initially the teacher participated in the telementoring project because of anticipated improvements in student writing. The teacher did not consider herself technology savvy and preferred

to have minimum involvement with the computers. Only 4–6 students could use the computers at one time, so the teacher had to oversee students occupied on other tasks. Throughout the pre-AlphasSmarts period, responsibility for technology rested with the project liaison who assisted in each class. On the other hand, AlphaSmarts integrated intuitively into the class structure. Because it was simply a matter of handing out the computers, the teacher took on the responsibility. Because AlphaSmarts worked so effectively as writing instruments, the teacher now had a better sense of how they fit into the curriculum. Additionally since everyone worked with the AlphaSmarts at the same time, the teacher could walk around the room and work individually with students who needed assistance (Russell, 2001a). Although the teacher did not significantly restructure writing time to incorporate telementoring, she did experience what Harris (2001) calls "authentic professional development" with the integration of the AlphaSmarts. The technology enhanced students' motivation for writing and offered students increased opportunities to write. With students engaged in writing, the teacher and student teacher were able to conference individually with students about their writing. This changed the instructional focus from teacher-centered to student-centered. Essentially, the technology created an authentic context that caused the teacher to modify her practice.

## Preservice Teacher Pedagogy and Effective Feedback

Preservice English teachers experienced an authentic context for teaching and improving students' writing skills (Means, 2000; Means, Penuel, & Padilla, 2001; Nellen, 2001; Patterson, 2001; Schank, 2002). Although telementors were initially overwhelmed by the gamut of literacy needs, talents, and abilities of high school students, as the year progressed they became more competent in providing balanced feedback, focusing critique on essential areas of content and mechanics, and learning which comments were perceived by writers as most helpful (Dulin et. al, 1994; Means, 2000; Nellen, 1998, 1999; Strike, 1991). The telementoring relationship provided preservice teachers a focused and intense experience for honing craft knowledge. Total confusion prompted meaningful inquiry about the best way to scaffold ideas and to help students develop as writers and thinkers (Collins, 1997). Modifying critical language, simplifying feedback, and offering more direct foci for revision resulted in more meaningful exchanges and more effective instruction. Findings indicate that mentors learned more from the experience than mentees which supports findings of other research (Harris & Jones, 1999; Strike, 1991). Furthermore, the perceived anonymity that comes from communicating over the computer rather than face-to-face (Means, 2000) allowed mentees and telementors to be honest about their writing abilities and the areas that

needed remediation. As the mentoring relationship is reciprocal, mentors examined and modified their own beliefs about writing and learned strategies for responding to student-generated texts (Dulin et al., 1994).

## Affective Benefits

Telementors also reaped the benefits of developing a meaningful relationship with interesting, engaged, and engaging adolescents. Developing a genuine regard for mentees as people rather than just students, they learned how to detect and address clues that signaled academic and emotional difficulties while exploring the boundaries of teacher/friend and adult/authority at a comfortable distance. What is most significant is that preservice teachers discovered ways that technology-based strategies honor and motivate urban students (Riel & Harasim, 1994; Teel et al., 1998), experienced network opportunities that required instructional assessment and decision making, and learned flexibility and patience. Furthermore, computer-mediated communication offered a context where students controlled exchanges (Harasim, 1990; Riel & Harasim, 1994), permitting a safe context in where both academic and nonacademic issues could be discussed. High school students trusted and looked forward to talking to mentors. Several mentors paid attention to what was occurring in students' lives and learned to develop an intuition toward emotional flags that students were raising.

## Collaborative Agents of Change

All participants in this research were collaborative agents of change. The classroom teacher, university educators/researchers, high school students, and preservice teachers worked to develop a collaborative model for using technology to improve low achieving students' skills in writing. Communication was and continues to be a critical factor in the collaboration in the form of clear directions to telementors, consistent feedback to writers, and effective pedagogical strategies for the classroom teacher and teacher educators. Critical was the political role university educators/researchers played in pursuing pathways, resources, and mechanisms available to affect the integration of technology in this school so that these students could accrue technological equity and access to the tools of the 21st century. Despite changes, we know that the economic and social contexts of this large urban district will continue to create variables that preclude students from reaping the benefits of technology that peers from more affluent urban and suburban schools enjoy. Yet, working together as collaborative agents of technology change, we can continue to improve the preparation of teachers who will eventually work in urban schools, support practicing urban teachers through human and technology resources,

research problems and possibilities entangled in using technology to improve writing, and establish meaningful relationships with urban students toward improving student achievement. Perhaps in some small way we can impact a very small part of what is needed to reinvent one urban school and provide a model for others to try.

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## Endnotes

1 The stimulus for this project comes from work underway at Boston College to infuse technology into the teacher preparation program as well as to foster Boston College's long standing commitment to the Allston-Brighton schools. The telementoring project is funded by Boston College's Preparing Tomorrow's Teachers to Use Technology (PT3) Grant and the Massachusetts Coalition for Teacher Quality and Student Achievement, a Title II grant, both from the U.S. Department of Education.

2 Bennett, Dorothy, Presentation, National School Network Conference, Jan. 1997

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