

# Teachers, Literacy, and Technology: Tensions, Complexities, Conceptualizations, and Practice

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While walking the streets of San Francisco, I spotted a Microsoft Office advertisement billboard. On it were two men standing in a white hallway, but the men did not have normal heads. Instead, they had dinosaur heads. The caption read, "Microsoft Office has evolved. Have you?" This advertisement reminds me that voices from various fronts, such as Microsoft, apply pressure to the educational system in subtle and not so subtle ways to incorporate more technology into the curriculum (U.S. Department of Education, 2001; Friedman, 2005; Lankshear & Knobel, 2002). This pressure threatens that if schools don't keep up with technology, students will be dinosaurs in this digital age. To combat this threat, information and communication technologies (ICTs) have become permanent fixtures in today's schools (U.S. Department of Education, 2001; Parsad, Jones, & Greene, 2005; Leu, Kinzer, Coiro, & Cammack, 2004). However, key reports show that teachers do not always feel well prepared to integrate educational technology into classroom instruction (Rakes & Casey, 2002; National Center for Education Statistics, 2000; NetDay, 2005). Therefore, the purpose of this study is to create a space for teachers to share their stories about technology and literacy in the midst of all the other voices and pressures.

An important first step in helping teachers use ICTs to enhance student literacy practices and learning is to understand how they conceptualize the impacts ICTs have on literacy, and then, to understand the relationship between their conceptualizations and their classroom practices relating to ICTs and literacy. While some researchers have explored new trends that engage students in literacy learning through the use of ICTs (Karchmer, Mallette, Kara-Soteriou, & Leu, 2005; Kist, 2005), few have investigated the teachers' perceptions of and reactions to the increased use of ICTs in the classroom. Therefore, this study was designed to add to the research by sharing the details, complexities, contradictions, parallels, conceptualizations, and practices of secondary content area teachers using ICTs to enhance literacy practices and learning. That is, this study sought to answer: (a) How do English, Science, and Social Studies teachers conceptualize the impact ICTs have on literacy practices and learning? and (b) What is the relationship between English, Science, and Social Studies teachers' conceptualizations and their use of ICTs in their everyday pedagogical practices to enhance literacy practices and learning? This paper will specifically focus on the four tensions the teachers negotiated as they attempted to put their conceptualizations into practice.

## REVIEW OF LITERATURE AND THEORETICAL PERSPECTIVE

### *New Literacies*

Numerous researchers write about new literacies, but they do not all use the same terminology. Rather, some refer to online literacies (Hagood, 2003), media literacies (Luke, 2003), digital literacies (Alvermann, 2002), and Internet literacies (Karchmer, 2001). In order to make sense of

the multiple voices defining and theorizing about the new literacies, I drew from theories linking literacy, technology, and learning.

First, technology and literacy have a transactional relationship (Karchmer et al., 2005; Leu et al., 2004). New technologies continually shape and reshape an individual's literacy practices. In turn, new environments of literacy continually shape and reshape technologies. In this way, technology and literacy constantly impact each other, never leaving the other unchanged.

Second, with the increase in ICTs, existing social practices transform while new social practices emerge. Print-based reading and writing are now only part of what students have to learn to be literate (Lankshear & Knobel, 2003). This notion of literacy augments Street's (1984, 2005) discussion of the autonomous versus the ideological model of literacy, by noting that literacy is not a technical and neutral act, but, rather, a social practice constructed and embedded within a social context, and can be extended to include literacy, technology, and learning. As Lankshear and Knobel (2003) note, multiple facets of society have changed, so literacies have changed. These changes not only impact our literacy practices, but our everyday social practices as well. Within education, student learning must reflect these changes in social practices brought on by the digitalization of modern society.

Third, literacy does not hold transparent, static meanings, but rather meaning is fluid and dependent on the reader's use of a given literacy for a specified purpose. This idea parallels the cognitive view that an active reader needs flexibility in applying appropriate strategies as comprehension needs change throughout the reading process while emphasizing the reader's *use* of texts (Alvermann, Moon, & Hagood, 1999; Hagood, 2003). This perspective views readers as active participants who create and use texts rather than as passive recipients of predetermined meanings. With regard to the new literacies, literacy becomes the ability to use the texts found within the ICTs, not just the act of absorbing and receiving messages. This concept does not simply address how literacy impacts individuals, but rather how individuals take up and use literacy. Admitting this fluidity acknowledges that multiple perspectives of reality exist (Labbo & Reinking, 1999). No two people view a given text or situation in the same way. Therefore, different meanings exist based on multiple perspectives on any given reality.

Additionally, I draw on Street's (1984, 2005) ideological model that not only emphasizes the cultural meanings but also the power dimensions of literacy. In looking at the power dimensions of literacy, I use Foucault's definition of power. Foucault recognizes that power is present in all relationships and is a relational concept (Fischman, 2000). In this sense, power is not a possession, but something that is negotiated, creating effects that will be assessed by those in the relationship as positive and/or negative (Best & Kellner, 1991). In my study, I specifically explore how individuals negotiate power relationships by positioning themselves and others.

## METHODS

### *Data Collection*

Sixteen teachers, both male and female, from two high schools within a high-achieving school district (as evidenced by test scores above state and national averages) voluntarily participated in this study. Their teaching assignments included ninth- through twelfth-grade English, Social Studies,

and Science, and their professional experiences varied from 1 to 31 years. The teachers were divided into two categories: (a) primary participants and (b) secondary participants.

Four teachers became the primary participants of my study. I observed each teacher for a total of 25 to 30 hours during the spring 2006 semester. The observation schedule varied from week to week as I observed each teacher one to four hours per day, one or two days per week. As I observed, I relied on Werner and Schoepfle's (1987) systematic approach for observing in naturalistic settings. This approach progresses through three types of observations—descriptive, focused, and selective—to gain a complete picture of the setting. I also conducted three in-depth, semi-structured interviews with each teacher. I used an interactive, situational, and generative approach by posing open-ended questions that initiated dialogue (Burgess, 1984; Fontana & Frey, 2000). As ideas and stories emerged, I asked further questions, helping teachers elaborate, explore, and describe their thinking and experiences. I audio-recorded and transcribed these interviews for analysis. I also gathered response data from these four teachers by conducting one final interview (St. Pierre, 1997). I took some of the points in the data that made me wonder or want more explanation, and about which I had written poems or narratives, and created interview questions for the teachers. Along with the questions, I also had the teachers read the poems and narratives, asking them to reflect on these texts and pivotal moments. I audio-recorded and transcribed these interviews and then used the transcripts as an additional data source.

I conducted focus group interviews with the other 12 teachers, my secondary participants. I conducted four focus groups in all with a sampling of the teachers, two at each high school. During the focus group meetings, I facilitated the discussion around questions from a prepared discussion outline. In doing this, I followed a structured approach due to my preexisting research agenda and my desire to keep the discussion concentrated on the topics of interest (Morgan, 1997). I also chose this structured format so that I could have some standardization between the two high schools.

I kept a researcher's journal throughout the research project (Richardson, 2000). In it I wrote memos to: (a) record the concrete details of what I saw and heard while I was in the teachers' classrooms; (b) articulate the data collection process; (c) connect what I was seeing and hearing with what I was reading professionally and wondering; (d) push myself to use multiple perspectives to navigate, shift, relocate, and renegotiate my thinking and analysis; and (e) record the raw feelings and emotions I experienced as a researcher.

I used the classroom observations to create focus group questions while also using focus group discussions to guide and direct my observations. Additionally, as I observed themes and conceptualizations during the classroom observations, I compared and contrasted these to the themes and conceptualizations I noted in the focus groups. My researcher's journal provided me a space to explore the interplay between the five data sources and to see how the themes and ideas noted during classroom observations and in-depth interviews were then corroborated during the focus group interviews. Finally, I used the response data interviews to move me "toward the unthought" (St. Pierre, 1997, p. 410).

### *Data Analysis Procedures*

Although I analyzed the data as an ongoing procedure during data collection, the bulk of the analysis occurred after I completed the classroom observations and focus group interviews. In the initial analysis phase, I spent time with the data, reading and rereading, immersing myself in the

words and ideas coming up off of the pages of the observation notes, transcripts, and memos. I coded and categorized the data. I read professionally, looking for connections and disconnects that I was finding in the data. And I also wrote. I valued Richardson's (2000) words that writing was a "way of *knowing*" (p. 293). I came to know the data, and the teachers, specifically, in new ways as I wrote about them throughout the data analysis process. Writing was not just an end activity, a way to write up my findings, but rather an integral part of my analysis and my developing understandings. The majority of the analysis, in fact, occurred within the writing process. I analyzed the data in more profound ways when I wrote about the data versus reading the data, because I was able to interact with the data in a different way. That is, when I wrote about the data, I engaged with it, recreating situations and viewing these situations through multiple lenses. Therefore, I considered each memo and each draft a piece of the analysis, as well as a piece of the data.

In the initial analysis, I concentrated on the four primary participants who became the focus of my study. The categories I used to organize the data emerged around the teachers' conceptualizations. I used two techniques to help me sort through the masses of data and to help me focus in on strategically chosen points of the data: I created numerous charts on the computer to organize my thoughts and highlight the connections I was making, and I wrote about my participants, the data, questions, and initial findings. For example, I looked for pivotal moments in interviews or observations where I identified a conceptualization emerging. From these moments, I wrote poems using the teachers' words, sometimes juxtaposing conflicting thoughts in order to see the complexity within the conceptualizations. These poems pared down the data so I could analyze specific moments and conceptualizations in concrete, specific ways. Then I created additional charts with the teachers' definitions of literacy and ICTs and their common conceptualizations side by side, noting trends, similarities, differences, problems, and connections. I color-coded ideas, cut and pasted data bits into the charts, and synthesized the teachers' words and actions into coherent thoughts. With these charts, I identified each primary participant's conceptualization of ICTs and literacy, noting overlaps and nonoverlaps.

Once I established the conceptual categories, I went into the focus group data, looking for confirming and disconfirming data. As noted by Frey and Fontana (1991), focus groups can add "valuable insight to the interpretation of a social or behavioral event" (p. 175). In this way, I used the focus group data to help me understand and interpret what I saw and heard with the primary participants. The focus group teachers served as secondary participants, corroborating the conceptualizations I uncovered and noting where I was on target and where I needed more thought and consideration.

My next phase of data analysis, which provided me with another dimension of the teachers, was working with the response data interviews. After reading and rereading the transcripts, I used the teachers' responses to add to, deepen, complicate, and corroborate my findings and wonderings. I wrote new memos and revised old memos, finding new ways to understand the teachers' conceptualizations and practices. I then incorporated this new data into the findings, allowing the teachers' voices to add to their stories. With this new data, I started looking at the teachers' stories through the tensions they negotiated between their conceptualizations and classroom practices. I used these tensions to organize and analyze the teachers' stories.

## RESULTS

When something sits in tension, multiple polarities act against one another, extending, stretching, and straining the object to its limits, or until it is taut. The teachers in my study sit in tension when it comes to ICTs and literacy. They expressed that they feel pulled, stretched, and extended between how they conceptualize the impacts ICTs have on literacy practices and learning and how they use ICTs to enhance literacy practices and learning within the classroom. My analysis identifies four major tensions: (a) access to ICTs adequate for the task, (b) sufficient levels of ICT knowledge for the task, (c) fear of the unknown, and (d) identifying who benefits from the ICTs and how these benefits can be determined. These tensions do not work independently of each other. That is, one tension can feed another tension while one tension can work in tandem with another tension. Although I identify each of the four tensions separately, the tensions rarely emerge independent of one another within the teachers' stories. Furthermore, multiple dynamics influence each tension. However, for this paper, I highlight only one dynamic for each tension.

### *Tension: Access*

The first tension, access, changes depending on the school and the teachers' objectives. Sometimes access directly relates to the teacher; i.e., what ICTs the teacher has available to complete a task. Other times access directly relates to the students; i.e., what ICTs the students have available to complete a teacher-assigned task. This tension brings power relationships, as noted in Street's (1984, 2005) ideological model of literacy, to the forefront. In the teachers' stories, one can see the teachers positioning themselves and others in complex ways when discussing who provides ICT resources to whom and how these ICT resources impact the power dynamics within a classroom or a school.

Every teacher in my study spoke directly about frustrations over access. However, one primary participant, Lynne, specifically brought this issue to the forefront when she struggled over asking students to access a podcast as a homework assignment. Similar to Karchmer et al. (2005), Lynne conceptualizes that ICTs shape and reshape literacy practices, and she understands that students need to engage with the ICTs because of this shaping and reshaping. Still, Lynne must negotiate the tension of access as she tries to put her conceptualizations about literacy and technology into practice.

First, Lynne believes that assigning ICT homework, such as a podcast, might marginalize the have-nots while privileging the haves by saying "I worry about isolating the kids farther who don't have the technology." With this frustration, she backs away from requiring students to access a podcast for homework. Lynne's backing-down signals the tensions she negotiates. She believes students should engage with ICTs, and feels this engagement will position them for a better future. However, her concern over the students' access to computers and the Internet at home prod her to consider the question, who is benefiting from the ICT-based assignments?

In Lynne's frustration, various power relationships emerge, and she positions herself and others in interesting ways. She believes the school district should provide her with a classroom equipped with adequate computers, Internet access, and software. She articulated, "If the administration wants a fully functioning class where all students have access to equal opportunity, then they have to provide me with a mini-lab in my classroom." But the school district has different priorities and

does not choose to spend their budget in the area of technology. Based on both the schools' lack of computer labs and inadequate ICTs in the teachers' individual classrooms, the teachers perceive that the district is not helping them to put their conceptualizations about ICTs and literacy into practice. Is the district ignoring the issue of access, or is it negotiating its own tension between space and technology?

Regardless, Lynne positions herself within this relationship as one without agency or responsibility for providing students with adequate learning opportunities. In turn, she positions the school/district as the one to blame for her inability to teach effectively since they will not give her a full-functioning classroom, as defined by her. Although she has four computers in the back of her classroom, these are not updated machines with the speed or capabilities necessary for doing the tasks she envisions for her students.

Lynne also recognizes that the power dynamic extends to the students based on socioeconomic status, ethnicity and race. In her perspective, students with economic resources continue to progress in ICTs and new literacies while students without access at home do not. In order to understand Lynne's perspective, I draw on Foucault's notion that knowledge brings a new dynamic to the power relationship (Gordon, 1980). In this social context, Lynne's classroom, knowledge of the ICTs, specifically computers, the Internet, and podcasts, shapes and reshapes the literacy practices of students (Karchmer et al., 2005). That is, students with access to and knowledge of these ICTs engage in different social practices than those without, emphasizing the connection Lankshear and Knobel (2002, 2003) make between literacy and technology: engaging in the new literacy practices associated with ICTs is a social act. However, this shaping and reshaping also impacts the power relationships between and among the students. According to Lynne, these knowledge levels, based on access, position the haves as the privileged ones over the have-nots.

Lynne takes this positioning of the haves and have-nots one step farther, noting that access affects literacy learning in general. She shares that 20% of the students are failing her class, and 80% of those students are Hispanic and do not have access to computers and the Internet at home. Here she acknowledges social injustices within the system, correlating socioeconomic status, race and ethnicity when implying that it is the Hispanic students in her class who do not have access. Without access, these students are positioned as the have-nots whose literacy practices and learning do not benefit from using ICTs. Without the ICT knowledge, the power dynamic shifts, giving them a disadvantage.

Still, Lynne conceptualizes that ICTs can impact literacy learning by narrowing the achievement gap for students. However, this conceptualization rests on the contingency that there must be equal access. From this perspective, it appears that Lynne believes she could be a good teacher, and students could be successful students, if we lived in an equal world. With this belief, Lynne again positions herself so she is not responsible. Instead, the social injustices and inequities within society impede her from being a truly effective teacher, and the blaming game continues.

#### *Tension: Knowledge*

The second tension, levels of ICT knowledge, highlights the teachers' un inventive uses of ICTs to enhance literacy practices and learning based on limited professional development and time. During one of the focus group interviews, one secondary participant shared that she did not really

know how to teach with technology, but she continued to try saying, “We’re doing this by the seat of our pants.”

As observed in the primary participants’ classrooms, lacking sufficient knowledge can breed insecurity regarding best practices. With that comes the question, who determines effective versus ineffective use? For example, one of the primary participants, Ben, was positioned by others, such as the principal, as an innovative teacher who used technology effectively with students. Based on the principal’s positioning, Ben was given a SMART board. With the SMART board, the principal and other teachers further positioned Ben as an innovative teacher with technology. However, after observing in Ben’s classroom and analyzing his definition of ICTs, it appeared he was limited in scope. Ben equates ICTs with multimedia and believes innovative practice is showing movie clips with a DVD player and the data projector. Although movie clips enhance student literacy learning, judging from the research regarding the new trends in content area literacy (Karchmer et al., 2005; Kist, 2005), his conceptualizations and practices involving ICTs and literacy lack innovation. If Ben’s practices are less than innovative and more centered around multimedia, why is he, then, positioned as a tech-savvy teacher?

Although multiple factors contribute to the teachers’ lack of innovation, Ben’s story highlights two specific issues that contribute significantly to this tension: limited professional development and limited time. The teachers in this study do not perceive that they are being taught how to use ICTs to enhance literacy practices and learning. Although some teachers acknowledged learning important ideas and skills in district-sponsored technology classes, others voiced frustration about the classes. Without effective professional development, teachers feel confused and discouraged, thus limited in their abilities to use ICTs beyond what they already know and do. This reality is seen in Ben’s use of the SMART board. Although he uses the SMART board to enhance literacy learning for students (i.e., displaying visuals, photographs, and maps), his lack of knowledge limits his ability to use the SMART board in more innovative ways.

The second factor that contributes to the teachers’ lack of knowledge is time. Teachers do not have adequate time to explore and experience ICTs due to administrative demands, curricular pressures, standardized tests, and the day-to-day responsibilities of teaching. All of the teachers in this study referenced these time limitations. For example, Ben talked specifically about not being more proficient with the SMART board because he did not have time to learn alternative ways to use it. Thus, despite access to an innovative piece of technology, he was still limited in his knowledge and use of it. One secondary participant also explicitly articulated this obstacle, saying, “The only time I did a WebQuest is when I was in a class to do it. That was four years ago, and I’ve tried to do another one. But I need the time.”

The teachers’ concerns resonate with McKenzie (2000), who asserts that making solid change with regard to the use of technology necessitates time away from the daily press of teaching. The teachers need time away from their regular day-to-day schedules to discover new and innovative ways to incorporate ICTs into their teaching. McKenzie’s study further resonates by calling for professional development opportunities that enable sharing and interaction among peers. The teachers in this study shared their need for space to collaborate together about technology and literacy. Without this time, the teachers believed they were “doing this [technology integration] by the seat of [their] pants.”

*Tension: Fear*

*When technology becomes “normal”...it is no longer complicated, nor is it notable to its users. It is a fact of life, a way of being in the world, a producer of social subjects that find it unremarkable. ...[S]o unremarkable that it seems “everybody does it.” (Lewis & Fabos, 2005, p. 470)*

The teachers' literacy practices and talk illustrated their acceptance of ICTs as the new norm—everybody's doing it. However, embedded in this conceptualization was a tension: fear. The teachers feared the new ICTs for various reasons, but this paper addresses one prominent reason: ICTs threaten traditional literacy practices. This threat instilled fear, leading the teachers to resist the new literacies while clinging to traditional notions of literacy and schooling.

One of the primary participants, Rich, sits on both sides of the fear-tension. On the one hand, Rich resists computers and the Internet because they take the human element out of learning. On the other hand, Rich proposes using Web site resources such as [www.dictionary.com](http://www.dictionary.com) over print-based resources to enhance literacy practices and learning.

First, Rich believes that literacy is a social act, but he cannot envision a social community developing via ICTs. As an English teacher, traditional school practices such as reading a story and talking about it in class take priority over all other learning activities, including ICTs. Rich sees technology bringing in new qualities to reading that he does not prefer or favor. Rich said, “I don't find reading online to be convenient at all. I don't like looking at a screen when I'm reading. I like to look at paper.” One of the secondary participants corroborated this feeling, saying, “For me, it [reading an electronic text] is an entirely different experience.” Like Rich, this teacher feared that too much technology in the classroom would change the learning experience. Rich specifically referenced student laptops, fearing that with the use of student laptops, learning would evolve into simply plugging students into technology in the classroom and that the human element of learning would fade.

Rich fails to grasp Karchmer et al.'s (2005) idea that literacy and technology have a transactional relationship. Rich acknowledges and accepts that technologies advance literacy as he directs students to open multiple windows on the computer when writing. Here, technology redefines the literacy practices associated with writing. But, Rich misses how literacy influences technologies, demanding new inventions based on new literacy needs. Since human contact and interaction are important to Rich, then these elements of literacy will help to shape and redefine technology. That is, technology will provide Rich with a new dimension, or form, of human contact. Instead of fearing the loss of traditional schooling practices, Rich might attempt to envision a future where his literacy needs, based on books and face-to-face contact, will be met by ICTs.

Still, the tension of fear is complex. Although Rich voiced fear over the ICTs, he demonstrated through the use of online dictionaries that he could use ICTs to enhance the students' literacy learning, conceptualizing that ICTs make literacy learning more efficient and meaningful. Like Lankshear and Knobel (2003), Rich acknowledged the ways by which ICTs were shaping and reshaping both his literacy practices and the literacy practices of his students. He encouraged students to write in new ways influenced by ICTs while also encouraging students to seek knowledge in new ways with online resources. Rich believed students were doing the same thing whether they were online or engaging with print-based dictionaries; he did not decipher between

the two media. Rather, he saw this as “a new form of the dictionary” serving the same purpose— a place to learn about words and their meanings.

Rich acknowledged the new form of the dictionary, but he did not equate reading a story in a book with reading a story on a computer electronically. He did not equate online communities and online learning with face-to-face interactions. So, on the one hand, he laughed off other teachers’ fears of online resources. On the other hand, he admitted his fear of losing human contact due to reliance on ICTs. On the surface, this seems to be a contradiction, but it actually reveals the heart of how Rich saw ICTs impacting literacy practices and learning. For Rich, “Technology is always supplemental. I don’t do any primary lessons around technology.” In Rich’s classroom, [www.dictionary.com](http://www.dictionary.com) was supplemental, never central, while reading a story was always central, never supplemental. Rich used ICTs and texts for specific purposes to fit within his notions of literacy learning. To him, ICTs and ICT-based texts had one role: to supplement the reading and understanding of literature, or print-based texts. This not only highlights his conceptualizations of ICTs, but also highlights his definitions of literacy and how he negotiates between the new literacies and traditional literacies.

### *Tension: Benefits*

The last tension relating to benefits draws on two questions: Do students benefit when teachers use ICTs? And, how do teachers determine the benefits of ICTs on literacy practices and learning? One of the primary participants, Charlotte, negotiated this tension by recognizing that students’ motivational levels depend on the ICTs being used to enhance the literacy practices and learning. Charlotte used a new technology with her biology students called a Lab Probe, or a mini-computer that collects data. In reflection, Charlotte believed students were engaged and interested in using the Lab Probes during the lab. However, on a separate occasion, when Charlotte asked the students to create PowerPoint presentations for their science projects, the students seemed unmotivated and disengaged. She was disappointed with the quality and lack of effort she saw in the PowerPoint presentations. With this, Charlotte wondered if students were moving beyond PowerPoint. In other words, is this ICT no longer novel, like the Lab Probe, but rather status quo?

As discussed by Lankshear and Knobel (2003), individuals take up older forms of literacy, transforming and approximating them into new forms of literacy to meet their needs. But despite the transformation and approximation, many times students are still participating in school-associated activities. For example, PowerPoint is now a constant part of school, replacing other mediums, but taking up the same meaning—a presentation must be given and notes must be recorded. The “old wine in new bottles syndrome” exists where long-standing school literacy routines simply have a new technology tacked on, but the substance of the practice has not changed (Lankshear & Knobel, 2003, p. 29). That is, teachers continue to do what they’ve always done while technology is seen as “an add-on, or a tool, to support forms of practice that are well-rehearsed circuits that travel along deep grooves” (Leander, 2007, p. 47).

Another way of looking at the “old wine in new bottles syndrome” is to consider Lankshear and Knobel’s (2007) most recent notion that new literacies have both “technical stuff” and “ethos stuff” (p. 7). If a literacy does not have ethos stuff, it is not a new literacy even if it has new technical stuff. With both the technical and the ethos, new literacies challenge conventional understandings

of time and space, offer new ways to think about tasks and practices, and encourage “participation, collaboration, distribution, and dispersion” (Lankshear and Knobel, 2007, p. 82).

This tension of benefit came out in the focus group discussions as well. One secondary participant said, “If it’s not in an up-to-date fashion, students don’t buy into it as easily as they used to.” Like Charlotte, this teacher understood that the ICTs have the potential to motivate student learning, because the cutting edge keeps students intrigued and motivated, or entertained. But what is cutting edge and motivational to the teachers seems to be different for the students. For example, the teachers looked to PowerPoint as being technologically advanced. One secondary participant said, “I think of a data projector being pretty high tech.” But, according to Charlotte, PowerPoint was no longer cutting edge or novel. So, do teachers lack sufficient knowledge of cutting edge technology? What does it mean to be cutting edge? Does the teachers’ limited knowledge of cutting edge technology limit their ability to use ICTs to motivate student learning? Do all technologies eventually lose their ability to be cutting edge? If so, then the real question is less about the technologies and more about the teachers’ knowledge levels of how to use ICTs in innovative, meaningful, and beneficial ways to motivate student learning. The question is, how do we add the ethos stuff, too?

In addressing these questions, Lankshear and Knobel (2007) propose that what is new is not fleeting; “[r]ather, new literacies are as ‘long’ as the ‘moment’ of their juxtaposition with ‘conventional’ literacies may last” (p. 20). With this view, the technical stuff is seen more as a “contingent enabler” versus a “prime mover” or a “heart of the matter” (p. 21). Again, it is not about the technology per se, but rather about the way we use technology to engage students in the new ethos stuff. This idea resonates with other researchers calling for fundamental shifts in teaching practices to make space for a new literacies perspective, not just new technology (Kist 2005; Patterson, 2006). In a new literacies perspective, the technology is simply a vehicle to take students to the new knowledge, not the focal point of instruction.

When considering the Lab Probes, Charlotte saw students engaged in the learning. She attributed this to the novelty of the technology, or the newness. Conversely, when students did not perform well with the PowerPoint, she attributed this lack of enthusiasm to the fact that these ICTs were no longer new or novel. However, Lankshear and Knobel (2007) argue against this thinking of fleeting new literacies. To them, it is not about the Lab Probes being new and the PowerPoint being old. Rather, the motivating factor for learning is purpose and engagement found in the ethos—combining both the technical and the ethos.

## CONCLUSION

With these tensions the teachers in this study must negotiate, the teachers are limited in their ability to envision beyond what they already know and do. Many of the teachers shared their desires for more technology, but envisionments, or ways they foresaw using ICTs to enhance literacy practices and learning in the future, did not accompany these desires. The four tensions relating to access, knowledge, fear, and benefits seem to impede the teachers’ ability to develop and formulate envisionments such as Gee’s (2006) video game-like simulations. Lankshear and Knobel (2007) call teachers to use both the technical stuff and the ethos stuff, emphasizing the new mindset that

acknowledges the way the world has changed “related to the development of new internetworked technologies [ICTs] and new ways of doing things and new ways of being that are enabled by these technologies” (p. 10). The world is being changed by people who are exploring new envisionments or possibilities with the digital technologies and electronic networks. But, the teachers in my study do not seem to be the people pushing for this change, or probing toward new envisionments. The only teacher who tried something beyond her understanding was Lynne with the podcasts. Still, she only took it so far, limited by her lack of knowledge, fear, and inability to envision a classroom using podcasts.

### *Implications for Teacher Education and Professional Development*

Although all of the teachers in my study conceptualize that ICTs enhance student literacy practices and learning in numerous ways, the teachers do not use ICTs in school to alter the students’ literacy practices and learning. Although they talk about how ICTs shape and reshape their own literacy practices and the literacy practices of their students, the ICTs do not shape and reshape their teaching practices in real ways. The teachers simply find ways to use ICTs to complete tasks they previously did without ICTs. This lack of transformation limits the teachers’ ability to put their conceptualizations into practice, and thus impact student literacy learning in new and inventive ways.

Due to these limitations, teacher education programs and professional development programs need to change. This change needs to occur at a deep level. For example, incorporating new literacies into teacher education programs requires that colleges of education provide teacher educators with not only access to ICTs, but professional development opportunities that teach them: (a) what the new literacies are, (b) how to create a space that values both the traditional literacies and the new literacies, and (c) how to incorporate the new literacies into the teacher education curriculum. According to a research study my colleagues and I conducted (Frambaugh-Kritzer, Maderazo, Ratliff, & Stolle, 2005; Stolle, Frambaugh-Kritzer, Kander, & Ratliff, 2006), many teacher educators do not have access to ICTs or the professional development needed to incorporate the new literacies into classroom instruction. Instead, teacher educators are left to their own devices and resources to integrate a new literacies perspective in their course curriculum. Without support from the teaching institution, teacher educators feel discouraged and defeated. Therefore, educating teachers in the new literacies that includes both the technical stuff and the ethos stuff requires that teacher education programs address the issue of ICTs and literacy, supporting and educating their teacher educators.

Professional development programs also must address the tensions teachers negotiate daily as they attempt to use ICTs to enhance literacy practices and learning in the classroom. As this study demonstrates, teachers need, and desire, professional development that provides them with time, resources, knowledge, and opportunities to collaborate with each other. Teachers cannot envision how ICTs enhance literacy practices and learning without adequate support. Therefore, professional development programs must meet the teachers’ needs, concerns, and tensions to provide time and space for new envisionments relating to ICTs and literacy.

*Beyond the Teachers*

This study brings the complexities of the tensions the teachers negotiate to the surface. These tensions limit their ability to put their conceptualizations about ICTs and literacy into practice, and thus impact student literacy learning in new and inventive ways. As seen in my study, giving teachers one classroom computer with Internet access and a data projector is not reaching students in meaningful ways. The teachers' stories reveal that, due to the various tensions, students rarely engage with ICTs within the school walls. However, the responsibility of student learning does not rest on the teachers alone. The voices from various fronts (legislative, economic, administrative, educational research) discussing teachers incorporating technology into their teaching practices also need to envision new ways to support and guide all teachers so all students can be empowered with the new literacy skills and dispositions needed in this ever-changing world.

Assistance needs to come from the entire community. One important part of the community is the business sector as it continues to push globalization and the notions of a flat world (Friedman, 2005). With that, the business sector can assist schools in important ways. The following list provides a jumping-off point as we recognize the teachers' tensions and support their negotiations of these tensions. Businesses can (a) provide access to adequate ICTs for all teachers and students; (b) collaborate with teachers and schools in professional development programs; (c) address teachers' fears about safety, security, and the unknown; and (d) fund research that addresses the tensions of benefit so teachers can see new ways of using ICTs to enhance literacy practices and learning.

Legislators also have a responsibility to support and guide teachers regarding ICTs and literacy. No Child Left Behind gives conflicting messages: it requires students to be technologically literate by the eighth grade (U.S. Department of Education, 2001), while valorizing traditional literacy practices through their assessment model of standardized tests. These contradictions fuel the teachers' tensions. In order to support and guide teachers, legislators need to reassess their educational goals for our children. What is it we are trying to do as an educational system? What do we really want students to learn? Our legislators can look to governments around the world such as the United Kingdom, Finland, New Zealand, and Australia, countries that are taking action to prepare their children with the new literacy skills and dispositions necessary in a globalized world.

In the end, we must continue to push ourselves forward, encouraging new envisionments. We must support and guide teachers, not because a Microsoft Office billboard pressures us to continually evolve, or because we fear we might become dinosaurs in this digital age, but rather because pursuing new ways of using ICTs to enhance literacy practices and learning can ultimately help students. We must hold each other accountable, teachers, scholars, politicians, and business people alike, working together for the betterment of our students.

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