Literacy pedagogy and computer technologies: Toward solving the puzzle of current and future classroom practices

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This paper explores how educators can negotiate the push and pull of traditional and new literacies by valuing both, and by crafting computer related activities that follow well grounded and theoretically based guidelines. The paper addresses the following questions: What are new literacies? How do our values surface as we experience the push of new literacies and the pull of traditional literacy? What theoretical perspective undergirds notions of effective pedagogy for both traditional and new literacies? How do computer technologies support students’ traditional literacy development? Why do new literacies require instructional transformations?

‘It was the best of times, it was the worst of times; it was the age of wisdom, it was the age of foolishness; it was the epoch of belief, it was the epoch of incredulity; it was the season of Light, it was the season of...’
Charles Dickens (http://www.quoteworld.org/quotes/3649)

Introduction
Dickens, writing about life in the 18th century, could easily have been writing about classroom literacy instruction in the new millennium. In a few carefully crafted words he eloquently characterised and puzzled over the tensions that existed between the burgeoning industrial age and the agricultural way of life that the new technologies challenged. His words sweep us up as readers into the tensions, reminding us through the printed words of a novel that whenever new, groundbreaking technologies appear on the scene, it is inevitable that people will live through a gritty time of transition that entails the pull of the new against the push of the old. Such times of major technological transition challenge our values, change our notions of work, and result in transformations of our practice.
I believe that it is currently the best of times and the worst of times for literacy pedagogy in the educational era of the new electronic, digital and information driven millennium. New computer technologies and the resulting new forms of electronic texts such as email and multimedia websites require new conceptions of literacy and literate behaviors (Flood et al., 1997; Leu & Kinzer, 2000). As a result of the increasing politicisation of reading instruction in the United States and other countries, such as the United Kingdom (Beard, 2000), governments are passing laws and commissioning reports that value students’ traditional product-oriented literacy achievement over newer computer driven literacies (Labbo & Reinking, 2000). Educators frequently grapple with how to address the transitional tensions that exist between the push forward of new digital literacies and the pull backward of traditional literacy.

The purpose of this paper is to explore how educators can negotiate the push and pull of new and traditional literacies by valuing both, and by crafting computer related activities that follow well grounded and theoretically based guidelines. I organise the paper around the following questions: What are new literacies? How do our values surface as we experience the push of new literacies and the pull of traditional literacy? What theoretical perspective undergirds notions of effective pedagogy for both traditional and new literacies? How do computer technologies support students’ traditional literacy development? Why do new literacies require instructional transformations?

What are new literacies?

New literacies required for meaning making with computer technologies are complex and multiple in nature. Multiple literacies involve combinations of symbolic modalities that are situated within specific social practices (New London Group, 1996; Gee, 2000). Thus meaning making in a new literacies environment includes learning how to read and write with multiple modalities (e.g., graphics, animations, video, audio narration, music, special effects, hyperlinks, search engines, power point presentations, and print) in ways that are significant within particular cultural groups (Andrews, 2004).

According to Lankshear and Knobel’s (2003) Short Classification scheme, new literacies can include electronic gaming, synchronous communication, asynchronous communication, mobile communication, weblogs, webpages, multimedia text production, scenario planning, critical literacy, Zines, Fan fiction, Magna/Anime, memes, and Adbusting. It is beyond the scope of this paper to address all of the new literacies listed in the Short Classification scheme. Therefore I focus on sampling of new literacies that I most frequently encounter within literacy instruction in elementary school classrooms and new literacies that are described by some leading thinkers in the field of literacy and technology.
How do values surface as we experience the push of new literacies and the pull of traditional literacy?

To engage in new literacies of computer technologies, users must utilise new strategic operations that allow them to successfully, thoughtfully, and efficiently navigate electronic, digital tools and resources (Knobel & Lankshear, 2003). Consider that in order to access Dickens’s quote online I experienced the push of new literacies. I needed to use or learn how to use new operational strategies: knowing how to access a search engine, succinctly identifying key words for the search, reading the list of results and efficiently determining which link was likely to provide the exact quote, scanning for information and several sites, linking to other web pages within documents that included supplementary information, critically reading information to determine credibility, deciding which resource to use, and copying and pasting from the website. In other words, the operational strategies at my command allowed me to engage in the functional use of new literacies for an authentic purpose. However, the need to function in the World Wide Web environment was not the only motivation guiding my decision making process.

I realised that my cultural and workplace peers in the educational academy value work that results from a carefully constructed assembly of knowledge from credible resources. To operate in this academic culture, I needed to cite the quotation website and record the date of retrieval in order to substantiate and to recognise the intellectual contribution of Dickens, the author and originator of the passage.

I also experienced the pull backward of traditional print-based literacy that required me to reflect upon and use my ability to read print. For example, I needed to be able to read words on the screen and connect them to a larger schema for comprehending text. I also have strong and fond memories of vicariously stepping into the gritty realities of 18th century England when I originally read the novel *A Tale of Two Cities* many years ago in a high school English Literature course. I read the novel in a cultural setting that taught me to value the turn of a phrase and the skillful use of sweeping metaphors that situate fictional events within an historical milieu. To this day, I prefer to read novels and devotional writings that I expect to emotionally or spiritually move me in print rather than on a computer screen.

What theoretical perspective undergirds notions of effective pedagogy for both traditional and new literacies?

I suggest that a productive theory that educators can use to guide both traditional and new literacies pedagogy is based on Osborne and Wittrock’s Generative Learning Model (1985). This theory addresses the process by which learners acquire knowledge and then use that knowledge to keep on learning. In a sense it explains how learners acquire and continue to use new
deep knowledge to help them generate new knowledge for social, academic, personal, political, and communicative purposes.

The first component, attention, relates to what students are attending to on the page or on the screen, because it helps us understand which literacy modalities, symbol systems, skills, strategies and elements students use during meaning making. The second component focuses on the nature of students’ affective engagements, social interactions, and cognitive efforts (independent and social) as they go about acquiring knowledge from page and screen. The third component considers what new knowledge students acquire, value, and use to generate more knowledge from both page and screen (adapted from Osborne & Wittrock, 1985). Generative learning components on computer screens include

- Attention: How multiple symbol systems and modalities are highlighted
- Knowledge Processes: Assembly of knowledge from various media resources, critically reading multiple modalities, getting immediate feedback, using Mind Tools (Jonassen, Peck & Wilson, 1999) and on screen thinking spaces
- Ongoing Applications to Generate New Knowledge: Interactive and social occasions to gain, value and use deeper knowledge.

How do computer technologies support students’ traditional literacy development?

Traditional literacies include a basic set of skills and strategies that have stood the test of time across various types of materials and approaches. In general, a meta-analysis of over forty computer assisted programs (CAI) in basic literacy skills found that those that include game playing, decision making, purposeful interactions, and scaffolding tools, such as intelligent agents, support students’ development of phonemic awareness, phonics, spelling, vocabulary, and comprehension. The studies reviewed have a small, positive effect size on early readers (Blok, Oostdam, Otter & Overman, 2002). For purposes of this paper and because my research occurs in the primary grades, I offer a brief overview of computer technologies that support traditional literacy skills that include writing development, phonological abilities, and independent reading. Research suggests that computer activities may support students’ development of these core literacy skills in a generative way.

Writing development – Word processing and creativity software support young students’ natural explorations with expressive forms of writing. For example in my own work (Labbo, 1996), I noted that kindergarten children working independently recursively wrote onscreen stories that included imported pictures (e.g., clip art, computer generated drawings) and printed text. Computer writing that utilised multimedia scaffolding allowed stu-
ents to try out symbolic representations and enabled their ability to recognise letters and gain insights into sound-symbol correspondence (Bangert-Drowns, 1989). Cochran-Smith (1991) also notes that word processing overcomes the print production difficulties some youngsters experience when writing with pencils or markers. The ease of revisions onscreen also supports young children’s efforts to move from a written draft to a final product (Edinger, 1994). Additionally, word processing increases the amount of children’s metacognitive discourse, organisational cohesiveness, and lexical density (Jones & Pelligrini, 1996).

**Phonological abilities** – Much of the research on how computer technologies may enhance students’ awareness and mastery of sound-symbol correspondences focuses on the role of audio support for students who are not yet able to decode independently. Studies demonstrate increases in students’ phonological awareness when programs utilise synthesised or digitised speech, or offer isolated speech sounds that students blend through interactions involving moving the computer cursor (e.g., Roth & Beck, 1987; Barker & Torgensen, 1995). A comprehensive study conducted by Reitsma and Wesseling (1998) offers strong evidence that computer activities develop phonological awareness. The researchers investigated the impact of computer program factors (e.g., blending activities), child factors (e.g., phonological abilities and home factors), teacher factors (e.g., teacher perceptions as presented on questionnaires), and durability of training (e.g., follow-up testing on transfer of learning on tasks that did not use the computer).

**Independent Reading** – Computer programs that present electronic versions of stories utilise various media modalities that include sound, speech, animation, video, and hypertextual links to additional resources. Students can click on a word to hear it pronounced or to read a definition. They can click on illustrations to see objects animate. These types of digital supports remove many barriers some young children experience to independent reading and comprehension. Electronic forms of text are less difficult for students to read, they are more engaging and interactive, and are more likely to be read completely by young children. Research in the area of electronic texts suggests that young children successfully interact with various media effects in ways that support their acquisition of story schema (Labbo & Kuhn, 2000), vocabulary development, sight word acquisition (Reitsma, 1988), and concepts about print (Lewin, 1995; McKenna, 1998).

The hidden animations or sound effects in electronic stories may lead to students’ engagement or distraction (Labbo & Kuhn, 2000). Research suggests that teachers need to clearly state expectations and should carefully monitor students’ interactions with electronic stories (Labbo, Sprague, Montero & Font, 2000). McKenna (2006) notes that effective literacy pedagogy with computers should include ‘computer-guided word study, electronic storybooks with decoding scaffolds, social interaction guided by
software applications, graphics packages to assist children as they illustrate their work, and software designed to reinforce concepts about print’ (p. xi).

Why do new literacies require instructional transformations?
Teachers and students across many grade levels in Developed/Industrialised countries (Developing Country, Wikipedia, 2006) now inhabit classrooms that are equipped with computers, Internet connections, desktop publishing capabilities, interactive multimedia learning resources, and Computing and Communication Technologies (CCT) that include new e-tools and e-genres. New electronic literacy genres include the informal (e.g., emails, chat rooms, discussion boards, video conferences), and the formal (e.g., website design, power point presentations of an assembly of knowledge, multimedia video compilations). The push forward of new digital literacies involves the critical need for educators to better understand how to help students learn how to use new computer technology tools and digital genres.

As briefly mentioned earlier, new digital literacies, being skillfully prepared to use, understand, and control computer-related content and processes to meet communicative, personal, academic, social, and cultural goals (Labbo, 2004) involve many new literacies (Kress & van Leeuwen, 2001). Literacy use in digital environments subsumes abilities to read and write printed text, but concomitantly diverges considerably from its beginnings in print (Gambrell, 2005; Kress & van Leeuwen, 2001; Lankshear & Knobel, 2003; Leu, 2000, 2002; Reinking, 1994; Wepner, Valmount & Thurlow, 2000). For example, reading print on a web page requires the traditional literacy skill of automatic word recognition or the ability to decode an unknown word with relative ease. However, new digital tools now allow readers to access word pronunciations or definitions of words encountered on any website on demand (e.g., Vocabulary, http://www.vocabulary.com/). This compensatory function problematises conventional notions of readability levels (McKenna, Reinking & Labbo, 1999) and is dependent upon a user’s ability to successfully employ a new literacy. Namely, a user must be able to navigate hyperlinks between the online supplementary resource documents and the original online text.

Transformations of literacy instruction occur in classrooms where computer technologies are integrated throughout the day and across the curriculum. For example, research indicates that email has encouraged student information exchanges around the world (Garner and Gillingham, 1998; Tao and Reinking, 2000; Tao et al., 1997). Email exchanges create authentic and motivating reasons to communicate. The instant return of messages overcomes other types of pen pal projects where delays through regular mail could take weeks between idea exchanges. Additionally, students who exchange email messages must learn the conventions of this rather unique
genre that requires a little bit of conversational style mixed with a little bit of recursive writing. For example, students who successfully email make reference to previous content, or they are sure to include in their response other segments of previous, threaded email exchanges that capture and preserve the context of the discussion.

Internet activities invite students’ inquiry projects and interdisciplinary work. In these instances students may gain literacy skills, employing all of the language and multimedia arts, while investigating and sharing relevant topically related content. Students are likely to be highly motivated as they go about purposefully assembling knowledge and communicating key insights from various online and on-page resources.

Perhaps one of the most important considerations driving the need for transformed, computer-related pedagogy is the fact that reading on screen is vastly different from reading on the page. Visual literacies in electronic environments include the ability to interpret, recognise, critically evaluate, and utilise visual graphics (e.g., icons, clip art, images, animations, video) as tools for thought, as avenues for learning, and as modalities for communication. Students who are adept in using new literacies skills and strategies are able to analyze and interpret complex information that is presented in an ever-changing series of linked modalities of meaning. For example, navigating through a series of websites requires students to quickly read and judge the information that is presented in a nonlinear fashion. When creating electronic text that is posted on the web, students must become aware of how to express their ideas in multimedia formats that are presented simultaneously or nonlinearly on a computer screen. These electronic genres must be crafted with an authentic and global audience in mind. Thus the demands of online reading and authorship require students to orchestrate a set of complex, new literacies skills (Kress & Van Leeuwen, 2001).

**Closing thoughts**

Educators are slow to change during this current era when we are experiencing tensions between the pull of new literacies and the push of traditional, print-based literacy. Classrooms where technology is effectively integrated into the literacy curriculum are sometimes scarce and hard to find, especially in the primary grades. As Turbill and Murray (2006) note, ‘It is our belief that currently most teachers of early literacy view technology as something that their students can “play” with during “free time” or as a “reward” after the real “work” has been completed’ (p. 93). In addition, websites that claim to be resources for educators may only offer little more than drill-and-skill activities or printable blackline masters pages to be copied (Turbill & Murray, 2006).

Research suggests that when integrating technology into the literacy curriculum, there is no one approach that is best. Every teacher who lives
through technological innovations needs to be prepared to negotiate the multiple realities that shape pedagogical decision-making (Labbo & Reinking, 1999). One effective way to bridge the technology transitional times is to design activities that are based on tried-and-true literacy practices and that also lend themselves to computer enhancement (see Labbo, 2005a, for ideas on Digital Morning Message or Digital K-W-L charts). It is clear that new digital technologies will not automatically transform classrooms if teachers are not comfortable using them for educational purposes. Coiro (2005) notes that teachers actively engage with technology professional staff development under two conditions: 1) they are in control of what aspects of technology learning they will focus on; and 2) training occurs within a community of learners including the school media specialist, the principal, and a university researcher.

Teachers remain accountable for teaching students to be literate in ways that prepare them to do well on high stakes paper and pencil tests (old literacies), and that prepare them to do well in their futures (new literacies), no matter what the curriculum or approach being used in a school district. Thus, during this time of transition it is likely that the best computer experiences will support new literacies and simultaneously or alternately enhance traditional literacy. It is critical that educators and policymakers persist in exploring ways to assist students in developing the technological skills that will be required of literate, globally active citizens of the future.

It is important to understand the values bases from which we operate as educators, policymakers and researchers. The pull backward of traditional print-based literacy results from the well-intentioned but short-sighted directives that are frequently imposed upon educators by policymakers who mandate, and high stakes testing that focuses primarily on students’ achievement of discrete literacy skills and strategies related to old or traditional literacy (No Child Left Behind, 2006; Rowe, 2005). It is crucial for policymakers to better understand the knowledge base and theoretical perspectives that should drive their directives for teachers’ use of computer technologies so they can value the role that new literacies must play in the classroom curriculum. Good or bad policies have intentional and unintentional domino effects that result in a chain of events that may lead to better students’ scores on print-based tests but may also lead to students who are not prepared for their literacy futures.

References


