TEACHERS' PERCEPTIONS AND PRACTICES ON USING TECHNOLOGY TO FACILITATE LITERACY INSTRUCTION IN KINDERGARTEN CLASSROOMS

by

MARY SUSAN WALLACE LOVE

(Under the Direction of Linda D. Labbo)

ABSTRACT

Technology has become an integral part of society in the United States. Computers are exerting a huge influence on how we live, work, and play. Acceptance and integration of computer technology into our lives has been a social phenomenon. This technology that has dramatically influenced society outside the schools is now affecting changes in the teaching and learning environment within the schools. It is transforming the way we think about education. One of the key responsibilities of educators is to empower students to learn by using the most effective instructional tools that are available to them. Schools are beginning to recognize the need to teach for the children's futures. However, the potential of new technology for learning is not found in the technology itself, instead in the way the technology is used as a tool for learning. Although the software and hardware available to teachers are important it's not the technology, it's the teacher. Teachers play a critical role in the integration of technology into instruction. In many schools teachers have access to an array of instructional technology to use, but there has been little evidence showing that technology is being fully integrated in the curriculum on a regular basis. With technology becoming more readily available in classrooms, it should be considered an integral, effective instructional tool within the school curriculum. Involving a case

study methodology, this study investigates how computer technology is being used during literacy instruction in three Kindergarten classrooms in an elementary school where classrooms are equipped with ample computer resources. Specifically, this study focuses on several questions: 1) what are teachers' perceptions about using computer during literacy instruction; 2) what computer technology do teachers use during literacy instruction; 3) what modes of meaning making are supported through the use of technology in literacy instruction; and 4) what new literacies are being used during literacy instruction? This study uses a multiliteracies theoretical framework and the multiple realities lens to examine the role teacher perception plays in how technology use is enacted in early childhood classrooms.

INDEX WORDS: Literacy, Reading and computers, Reading instruction and technology, Teacher perceptions and technology, Teacher practices and technology, Multiliteracies, New literacies, Multimodality, Computers in classrooms

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MARY SUSAN WALLACE LOVE

B.S.Ed., University of Wisconsin – Whitewater, 1974

M.Ed., Middle Tennessee State University, 2000

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MARY SUSAN WALLACE LOVE

Major Professor: Linda D. Labbo

Committee: James F. Baumann
Robert Maribe Branch

Electronic Version Approved:

Maureen Grasso
Dean of the Graduate School
The University of Georgia
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DEDICATION

This dissertation is lovingly dedicated to my husband, Donald Patrick Love. How can I thank you for your unconditional love and support that you've given to me over the years? Little did we know when we started our journey together where life would lead us. You've been my biggest supporter, never lost faith in me, and no matter what happens you always handle it. You've helped me through times I didn't think I could go on and your strength has never wavered in your commitment to letting me fulfill my dream. Now my dream is here and our next dream is ahead of us. We will go forward on our journey together to wherever life takes us again. We may not know where that will be, but I know I will be there with you.

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CHAPTER 1

INTRODUCTION

Technology has become an integral part of society in the United States. Technology has become rather ubiquitous. Computers and technology are continually impacting our daily lives. It is becoming almost impossible to function in our lives without using some form of technology. There are constant reminders of how it has been enmeshed into all aspects of life, whether making a phone call, using a credit card, using an automated teller, buying groceries, or even driving a car (Haughland & Wright, 1997). There has been no single technological tool in over fifty years that has had such an impact on so many lives as the computer (Kominski & Newburger, 1999). The pace at which technology is changing is so rapid that computers and the Internet are becoming indispensable in modern life in the United States (U.S. Department of Education, 2003). Acceptance and integration of computer technology into society is a social phenomenon (Kowinski & Newburger, 1999). As a result of this phenomenon, it is inevitable that young children will have exposure to computers, and computer technologies will be instrumental in their lives (Haughland & Wright, 1997).

Computer technology, that has dramatically influenced society outside the schools, is now affecting changes in the teaching and learning environment within the schools (U.S. Department of Education, 2004). Computer technology and the Internet as a source of information and for communication are having an impact in classrooms. Students are being tremendously affected by this technological evolution because they often have access to knowledge and information instantaneously, as well as access to images to supplement

information that was formerly provided only through printed text (Ferguson, 2001; Di Benedetto, 2005). Students are being educated in a world where “to know” means more than just having information stored in their memory, now it means being able to access information and then having the knowledge to use the information they get.

Students’ use of computer technology and the Internet has increased greatly in recent years. Children begin using computers, including the Internet, early in their lives (U.S. Department of Education, 2005). The average age of children who start using computers in the United States is 18-24 months (Casey, 2000). The largest group of new users of the Internet in 2001-2002 was 2-5 year olds (U.S. Department of Education, 2004). A Computer and Internet Use supplement to the Current Population Survey conducted in October 2003 collected information about children enrolled in nursery school through twelfth grade. Results from the survey for children attending nursery school showed that 67% used computers and within that group 23% used the Internet. Eighty percent of children in Kindergarten used computers with 32% of that group using the Internet. For children in first through fifth grades, 91% used computers with 50% using the Internet. Schools have been expanding Internet access into classrooms, computer labs, library/media centers, and other rooms used for instructional purposes. The U.S. Department of Education (2005) reports the percentage of instructional rooms having Internet access has grown from 3% in 1994 to 93% in 2003.

However, having computers available in school does not assure, nor make it more likely, that technology will be used. In many schools teachers have access to an ample amount of instructional technology to use in their teaching and for learning in the classroom but there has been little evidence showing that technology is being fully integrated into the curriculum on a regular basis (Di Benedetto, 2005). A survey of public school teachers found that 66% reported

using computers or the Internet for instruction during class time. When asked to respond about their level of preparedness to use computers and the Internet, elementary teachers reported that 10% felt very well prepared, 23% felt well prepared, 55% felt somewhat prepared, and 12% felt not at all prepared (U. S. Dept. of Education, 2000). A second survey of public school teachers by the U. S. Dept. of Education (2005) asked which types of technology teachers considered to be essential for their teaching. Having a teacher computer station with access to electronic mail was reported as essential by 68% of the teachers. Teachers felt that having access to the World Wide Web was the second most essential technology reported for their teaching with 61%. Fifty-six percent responded having a telephone in the classroom was important. Other essential technologies included encyclopedias and reference materials on CD-Rom at 51%, having at least one computer for every four students at 49%, and having presentation software at 35%. Multimedia authoring programs, full-page scanners, and video cameras were types of technology least frequently reported as being essential (U. S. Dept. of Education, 2005). This survey also asked teachers about the availability of technology in their classrooms. A majority of teachers, 57%, felt that computers and other technology were sufficiently available for their classrooms. Among the teachers who responded, 25% strongly agreed technology was sufficiently available, 32% somewhat agreed, 8% neither agreed nor disagreed, 19% somewhat disagreed, and 15% strongly disagreed (U. S. Dept. of Education, 2005).

With the passage of federal legislation and state mandates, using technology during literacy instruction has become a topic faced by teachers. In 2001, the No Child Left Behind Act (NCLB) was passed to enact multiple public policy initiatives designed to increase student reading achievement. Part D of NCLB, known as the Enhancing Education Through Technology Act of 2001, has as a primary goal “to improve student academic achievement through the use of

technology in elementary schools and secondary school" (p. 1671) and two additional goals: (a) "to assist every student in crossing the digital divide by ensuring that every student is technologically literate by the time the student finishes the eighth grade, regardless of the student's race, ethnicity, gender, family income, geographic location, or disability" and (b) "to encourage the effective integration of technology resources and systems with teacher training and curriculum development to establish research-based instructional methods that can be widely implemented as best practices by State educational agencies and local educational agencies" (NCLB, 2001, p. 1672).

Responding to the goals of NCLB, states across the nation have set statewide technology standards for integrating technology into the teaching and learning within the educational curriculum. Teacher technology standards identify skills teachers need to use computers and other electronic equipment effectively in schools (Burke, 1998, para. 2).

Some states, such as Georgia, have adopted standards developed by the International Society for Technology in Education (ISTE), a nonprofit organization providing leadership and service for improving teaching and learning in K-12 classrooms and teacher education through effective use of technology (Burke, 1998, para. 16). According to ISTE, all classroom teachers should be prepared to: (a) demonstrate a sound understanding of technology operations and concepts, (b) plan and design effective learning environments and experiences supported by technology, (c) implement curriculum plans that include methods and strategies for applying technology to maximize student learning, (d) apply technology to facilitate a variety of effective assessment and evaluation strategies, (e) use technology to enhance their productivity and professional practice, and (f) understand the social, ethical, legal, and human issues surrounding the use of technology in PK-12 schools and apply that understanding in practice (ISTE, 2000).

The Educational Technology Cooperative of the Southern Regional Education Board (SREB) examined its member states' adopted technology standards and determined that they addressed varying levels of competency. These competency areas include: (a) fundamental computer operation skills and understanding of technology concepts and terms, (b) ability to use technology for personal research and communication, (c) understanding of legal and ethical issues pertaining to computer use, such as how copyright applies to classroom software use and what additional safety measures may be needed in the classroom, and (d) the ability to use computers in a variety of ways to integrate technology into classroom activities that support student learning. Of these four competency areas, SREB contends the most difficult for teachers is the requirement to know how to integrate technology into instruction (Burke, 1998, para. 3).

According to Preparing Tomorrow's Teachers, August 2000,

> The power of technology for student learning doesn't come from the presence of classroom computers or the Internet, the real power of technology in education will come when teachers have been trained well and have captured the potential of technology themselves. Teachers must model the behavior students are expected to learn (cited in Burke, 2000, para. 1).

Challenges In Literacy Instruction

Teachers in classrooms today face a number of challenges in literacy instruction. One challenge is the changing definition of literacy. Literacy is moving beyond paper-and-pencil or print-based media. We are living in a time when change is taking place in the nature of literacy and learning. Digital and multimedia resources are entering our world and ultimately entering our schools. Digital communication and multimedia technologies are becoming part of the information age in which we live and are helping to redefine literacy and learning (Kinzer &

Leu, 1997). New definitions of literacy are expanding the concept of literacy to include electronic environments that give authors and readers additional information and capabilities, expanding what constitutes being considered literate in society, and includes how the role of the literacy teacher and learner is changing (Leu, Kinzer, Coiro, & Cammack, 2004).

Early societies used simple symbol systems involving the available technologies of oral sounds, musical instruments such as drums and flutes, gestures and facial expressions, and artifacts. Over time, societies moved through stages of literacy practices from oral language to early writing, from early writing to manuscript writing, from manuscript writing to print. As societies became more complex, new technologies allowed new possibilities to communicate and represent knowledge. More recently, literacy practices have begun moving from print to video, from video to digital and/or multimedia, and from digital/multimedia to virtual reality. At each stage, the definition of literacy changed along with how literacy's role in society was perceived (Bruce, 1997, 1998).

Describing the changing nature of literacy, Leu, Kinzer, Coiro, and Cammack, (2004) state,

> Literacy, therefore, may be thought of as a moving target, continually changing its meaning depending on what society expects literate individuals to do. As societal expectations for literacy change and as the demands on literate functions in a society change, so too must definitions of literacy change to reflect this moving target (p. 1584).

A second challenge for literacy teachers involves the importance of the role they play in the literacy classroom. At the beginning of the 20th Century, literacy was dominated by behaviorist ideas. As the century progressed, literacy was seen as more of a language-based, developmental process that drew upon ideas and concepts from cognitive psychology and

linguistics. During the ending years of the century, literacy was seen as more multidisciplinary (Harris & Hodges, 1995). This shift in how literacy was defined is also seen in a shifting paradigm in instruction. This paradigm shift is moving instruction in classrooms from being teacher-centered to being more student-centered. Children are being viewed as active learners who construct knowledge during the learning process rather that being passive receivers of information (Di Benedetto, 2005). The teacher's role is changing from being a giver of knowledge to being a facilitator of learning. Researchers on literacy instruction have identified principles that contribute to the effectiveness of literacy instruction (Leu & Kinzer, 2003; Tompkins, 2003). A common thread running through these principles is that the teacher plays a key role in effective literacy instruction.

A third challenge facing literacy teachers is how they can incorporate technology into the literacy classroom and the literacy learning of the children in their classrooms. One of the principles of effective literacy instruction identified by Leu and Kinzer (2003) is to teach for children's literacy futures. These researchers believe,

> Integrating computer and Internet technologies in literacy instruction allows children to use their emerging literacy abilities in the most current literacy that is valued in society and can enhance children's learning of both conventional and emerging literacies. Teaching in ways that prepare children for emerging communication and literacy demands is important (p. 510).

There are multiple ways computers can be used by literacy teachers. Computer use in literacy instruction falls into five categories: (a) learning about computers, (b) learning from computers, (c) learning with computers, (d) learning about thinking with computers, and (e) managing learning with computers (Kinzer, 1986; Leu & Kinzer, 2003).

The first category, **learning about computers**, includes activities focusing on the acquisition of knowledge about the computer and peripheral equipment. Literacy teachers need to make sure students know how to work the equipment and handle the media. They also need to determine the rules for using the computer and any special knowledge that could be required to use software and media appropriately. The second category, **learning from computers**, involves guided and independent practice to reinforce concepts. Drill-and-practice software, often presented in game format, does not teach but allows students to practice what has already been taught. Tutorials teach and then provide practice. Teachers can use tutorials to continue a lesson or reinforce a lesson that is being taught. And tutorials can be useful for students who need an alternative presentation of material or additional instruction. The third category, **learning with computers**, provides students with experiences for learning. With simulation software, learning takes place in ways that resemble learning in the real world. Information is presented within contexts and consequences of a student's actions and decisions are seen and act as self-reinforcing. Students are provided interactive contexts where they can try new concepts, see any consequences of decisions they make, and then refine their ideas. The fourth category, **learning about thinking with computers**, involves learning programming languages that result in learning general problem solving skills. This learning can transfer over to other tasks as a result from the structured vs. less structured type of learning and teaching environment. The fifth category, **managing learning with computers**, involves aspects of effective instruction such as test construction or compiling progress records which can often be done more effectively with the computer (Kinzer, 1986).

These categories are based on a computer use scheme created by Taylor in 1980 that viewed the computer as a "tutor", a "tool", and a "tutee". The computer was seen as a "tutor"

because it patiently provided exercises or questions. It was seen as a “tool” because it made life easier and its functions saved time or made things easier. It was seen as a “tutee” because it could be taught or programmed and while being taught, the human teacher was learning (Kinzer, 1986).

Research has shown that the integration of technology into the curriculum has a potential to improve the quality of teaching and learning in the classroom. However, in order for this potential to emerge into the classroom, teachers need to consider how the use of the computer relates to the process of learning and to the environment for learning within the classroom (Schank & Cleary, 1995). Teachers need to understand the connection between technology and learning and then use that understanding to intertwine the two in ways that make each indispensable to what is being taught and what is being learned (Lowther, Bassoppo-Moya, & Morrison, 1998.

Teachers have recognized the potential of computer and information technologies to support effective and innovative instructional practices and that technology-supported practices hold promise for strengthening motivation for learning, transfer of knowledge, and understanding content. The potential of new technologies for learning is not found in the technologies themselves, but instead in the way the technologies are used as a tool for learning (Owston, 1997; Valdez et. al, 1999). Labbo (2000) contends that teachers in new millennium classrooms need to take into consideration social, psychological, motivational, pragmatic, and technological factors in creating and managing an appropriate learning environment. Technology should be considered an integral element in the school curriculum. Schools need to use technology to its fullest potential in educating children instead of viewing it in a secondary role.

The responsibility of the schools should be to empower children to learn within the classroom environment with the tools that are available to them (Ferguson, 2001).

A study by the Office of Technology Assessment (1995), examined what happened when teachers used technology in their teaching, reasons teachers did not use technology, factors influencing technology integration in school, and the roles schools, districts, states, the private sector, and the federal government play in helping teachers with new technologies. This report gave several conclusions. First, while trying to ensure that students are prepared for the world they will face when they leave the schools, in the process of teaching students to learn with technology even though millions of dollars has been invested in educational hardware and software the teacher has been forgotten. Second, helping schools make the connection between teachers and technology may be one of the most important steps to making the most of investments in educational technology and children's futures. And third that, "At the center of effective use of instructional technology is the teacher" (p. 50).

According to Bruce (1997), literacy encompasses the kinds of reading, writing, and learning activities that people engage in. All of these activities are affected by the technology that is available in their environment. In society, computer technologies have become an integral part of life. In schools in order to provide students with the literacy skills they will need and to "teach for children's literacy futures" (Leu & Kinzer, 2003, p. 5), literacy instruction needs to incorporate the use of technology. Just as the teacher is the key for effective literacy instruction, in meeting the challenge of incorporating technology into the literacy curriculum, the teacher is again the key.

Reinforcing the key role the teacher plays in the integration of technology into instruction, Kreul (2001) states,

> Teachers are the most important component in the educational technology equation and must be prepared to use technology appropriately to improve teaching and learning. Teachers must be committed to making learning more meaningful and engaging for all students and have the courage to change instruction to meet learner's needs. Although the software and hardware available to teachers are very important, it's not the technology, it's the teacher! (pp. 231-232).

Purpose of the Study

The purpose of this study was to investigate teachers' perceptions and practices on using technology to facilitate literacy instruction in early childhood classrooms. Toward this purpose, I incorporated the multiple realities developed by Labbo and Reinking (1999). Multiple realities can be used to examine the intersection of technology and literacy instruction. It does not focus on technology as a device, rather it focuses on the potential of what technology might do, what kinds of activities technology might be applied to, and what implications technology may have on literacy instruction beyond the traditional, established goals. Multiple realities represent a continuum for integrating technology from passive use toward the goal to use technology in a more transformative role. Multiple realities consist of five goals for integrating technology in literacy instruction: (a) new digital technologies should be available for literacy instruction, (b) new digital technologies should be used to enhance the goals of conventional literacy instruction, (c) new technologies should be used to positively transform literacy instruction, (d) new technologies should be used to prepare students for the literacy of the future, and (e) new technologies should be used to empower students (p. 481).

For the first reality, availability of hardware and software is a key issue. Putting acquired technology in schools becomes a dominant factor in this reality because it is believed that

making technology available will influence instruction positively. When this is the dominant reality, issues of technology and literacy are guided by the assumption that when hardware and software are available positive things will happen even though little attention is given to how it is actually used or in creating situations to facilitate using it. In schools and classrooms when the feeling that acquiring technology is more important than how it will be used the use of the technology is often minimal. Computers used in elementary classrooms are often used for games or drill-and-practice activities. The organization, values, attitudes, and overall school culture can also affect how teachers use technology.

The second reality involves the idea that new technology is often understood in terms of what is familiar. Conventional learning goals and traditional activities are key to this reality. Research conducted within this reality often concludes that computer-based activities are comparable to conventional instruction. In this reality a distinction between what can be learned from a computer and what can be learned with a computer needs to be made when examining research and how it is related to instruction. Learning from a computer focuses on short-term specific outcomes when the computer is one of the options for delivering instruction. Research studies following this focus are usually not aligned with a theoretical orientation. Learning with a computer focuses on long-term broad outcomes where the computer has an active role in shaping the content and tasks in the learning that goes on. Studies following this focus are more likely to have a theoretical orientation.

In the third reality, connection between research and practice is seen in terms of documenting the degree to which the technology transforms instruction in the classroom, determining factors that are barriers to transforming instruction, and determining how to facilitate the positive effects of the transformation. Researchers who adopt a transformation

perspective are the ones who explore alternative research methodologies. Transformations may be incidental by-products of integrating the technology into instruction.

The fourth reality involves the belief that what constitutes literacy and what the requirements of literacy will be in the future are changing as a result of new technologies. This reality is defined by change and acknowledging it means looking at the extent changes are occurring, what the changes are, whether the changes are positive or negative, and what the changes imply for the future of literacy. Research in this reality aims to study the processes of change brought about through interactions with technology by teachers or students and the processes through which technology does or does not become integrated with the curriculum and classroom environment. Other areas of research deal with views about technology among children and adults, levels of availability and use of technology, and how the demands of the workplace and society related to literacy may be changing. This reality challenges teachers to prepare students to become literate which is difficult because the nature of what future literacy will be is not clear and because teachers are not fully technologically literate themselves.

The fifth reality looks at technologies from the viewpoint of how they can potentially empower students. This reality sees technology's influence on literacy and literacy instruction through a sociocultural viewpoint. Within this reality, enthusiasm for using technology may be the result of the concern that not embracing the use of new technologies could perpetuate a situation where inequities and disenfranchisement remains. Research within this reality supports the perspective that technologies can be understood as part of a sociocultural orientation and that using technology can lead to empowerment for those given the opportunities to use it. This reality adds a dimension for considering the role of technologies in literacy instruction.

Theoretical Framework

In the past literacy has been focused upon language. With the introduction and use of new technologies, we use and interpret multiple types of literacies that are encountered in multimodal texts (New London Group, 2000).

Multiliteracies has been defined as a set of open-ended and flexible multiple literacies that are required to function in diverse contexts and communities (New London Group, 2000). Within this framework, multiple literacies build upon a foundation of conventional literacy and work to extend it, not replace it (McKenna, 1998; Leu, Kinzer, Coiro, & Cammack, 2004). Multiple literacies work to transform literacy instruction and lead to the empowerment of students (McKenna, 1998; Lemke, 1998). And this framework involves multiplicity of literacies that are emerging as a result of new and evolving technologies that are available and that require new literacies that are multiple in nature (Lemke, 1998; Leu, Kinzer, Coiro, & Cammack, 2004). Multiplicity requires understanding "how various literacies and various cultural traditions combine these different semiotic modalities to make meanings that are more than the sum of what each could mean separately" (Lemke, 1998, p. 288).

The multilieracies theory is associated with the work of the New London Group. In 1994 this group of educators met in New London, New Hampshire to discuss the state of literacy pedagogy. Following their discussions, the Group presented their 'theoretical overview of the current social context of learning and the consequences of social changes for the content (the "what") and the form (the "how") of literacy pedagogy" (New London Group, 1996, p. 63).

The "what" of literacy pedagogy involves what students need to learn. The multiliteracies pedagogy focuses on representational modes in a much broader sense than just language. Language and meaning making forms are resources that are continually being remade by the

user. Meaning is being made in ways that are becoming more multimodal because the way language is used is continually being reshaped by new forms of communication media. In relation to learning this group proposed a meta-language based upon the concept of Design.

According to the New London Group (1996, p. 81), “The concept of Design emphasizes the relationships between received modes of meaning (Available Designs), the transformation of these modes of meaning in their hybrid and intertextual use (Designing), and their subsequent to-be-received status (The Redesigned).” Design is dual faceted. It has a conceptual and an expression side. Design is a way to understand discourses within a communication situation and involves a deliberate choice of a mode for representation and how that representation will be framed. It acts as a blueprint for using available resources of information (Kress & Van Leeuwen, 2001). In the multiliteracies pedagogy, any semiotic activity that includes the use of language for producing or understanding text is considered part of Design. Available Designs, Designing, and The Redesigned elements together illustrate how constructing meaning is an active, dynamic process (New London Group, 1996).

Available Designs include the structural elements of language and other meaning-making systems as well as a range of socially produced discourses that intertwine and interact dynamically (New London Group, 1996). Discourses are ways of knowing reality that are developed within social contexts in ways that are appropriate to the interests of the participants in those contexts. Discourse contexts can be broad or narrow, explicit to a situation or non-specific. They can be realized in a variety of ways, although only in semiotic forms that have developed a means for understanding them. People often have several discourses available to them and will use the one that is most appropriate to the situation in which they find themselves (Kress & Van Leeuwen, 2001). Order of discourse makes it possible for two different discourses

to speak to each other. Discourses shape and in turn are shaped by one another and involve producing, reproducing, and transforming the various types of participants (New London Group, 1996). Gee (1996) contends that every discourse comes with ways of seeing, acting, thinking, and talking, and discourse and conditions within contexts require people to take on identities within a discourse. For example, teachers are seen as designers with regard to the learning process and the educational environment. The discourse involved in teaching literacy in Kindergarten is shaped by and helps to shape the discourse for being an early childhood classroom teacher.

Three functions of Available Design, ideational, interpersonal, and textual, help the formation of new expressions of meanings (New London Group, 1996). Available Designs become the resources of Design (New London Group, 2000).

The process of Designing involves representation and re-contextualization to shape new meaning by working with, and at the same time upon, the new evolving meaning. It is not merely a repetition of meaning but involves transformation, which is making a new use of old information – a recombining of the resources of meaning making (Available Designs). Activities such as reading, writing, listening, and speaking involve the process of designing (New London Group, 2000). For example, as readers decode text (as Available Designs), they draw upon their interests, life experiences, and background knowledge (Other Available Designs) as resources for making new connections and constructing new meaning to comprehend what they read. Reading then is the new production (Designing) of new meaning. It transforms the readers' information (Available Designs) received during a meaning-making event into unique and newly formed meaning (The Redesigned) (New London Group, 1996).

The Redesigned, unique, new meaning is the result of the process of re-contextualizing (Designing) produced through human agency. Through the process of The Redesigned, people who are making meaning reconstruct and redefine their identities (New London Group, 1996). For example, when expository text is read, information learned as a result of reading is recontextualized and becomes part of the reader's knowledge base. Then, as the reader decodes another new text, that recontextualized, newly acquired knowledge may be accessed to aid in constructing new meaning. The Redesigned new meaning in turn creates new available resources (Available Designs) for future meaning making (New London Group, 1996).

The New London Group (1996) identified six major areas of Design: (a) linguistic, (b) visual, (c) audio, (d) gestural, (e) spatial, and (f) multimodal. Each of these areas is a mode of meaning making.

Linguistic design is the one most commonly connected with literacy because its focus is on using resources for presentation. This design emphasizes the meaning-making potential of language. According to the New London Group (2000), it includes the elements of a) delivery, b) modality; c) transivity (choice of words); d) vocabulary and metaphor; e) nominalization of process (how actions, qualities, assessments, or logical connections are turned into nouns or states of being); f) information structures (how information is presented); and g) logical and global coherence (the logical relations between clauses and the organization properties of a text).

Visual, audio, gestural, spatial, and multimodal designs are becoming increasingly important as forms for meaning making. Visual design includes images, layouts, or screen formats. Audio design involves music and sound effects. Behavior and body language are a part of gestural design. Spatial design incorporates environmental or architectural spaces. Because

multimodal design includes patterns of connections between the other modes and connects all the other design forms dynamically, it is considered the most significant.

According to the New London Group's perspective (2000) we are "designers of our social futures" (p. 36). The pedagogy of multiliteracies focuses on how cultural and linguistic diversity along with the impact of new communication technologies are changing what is demanded of learners (Lankshear & Knoebel, 2003). The New London Group (1996) argues that multiple communication channels and increasing diversity in the world calls for a broader view of literacy.

Many children in early childhood classrooms today have been surrounded by a world of technology from the day they were born. They do not know a world without the impact of technology on many aspects of their lives. The potential for technology to change what and how they learn during literacy instruction in the classroom is phenomenal. Schools need to work toward empowering students by integrating the use of technology into the literacy curriculum to provide them with the education they both need and deserve for their futures.

> Technology is transforming how we think about education. Computers have changed the way the world works. And we need to make sure our children have the skills to compete in this new global economy. Every single child deserves the opportunity to succeed in the 21st Century (Paige, 2005, para. 5-6).

Former U. S. Secretary of Education Rod Paige made these statements on January 7, 2005, when the National Education Technology Plan was released.

As an educator I agree that the educational system needs to be ready and able to prepare the children of this country to live and compete in the 21st century. In order to do this, I feel there is a need to examine the impact technology can have on the instruction teachers will be able to

provide through the incorporation and integration of various types of technologies and how the use of technology affects children's learning.

Parents, educators, politicians and the general public have all embraced the belief that computer technology is a powerful educational tool (Johnson, 1999; Morrison, Lowther, & DeMeulle, 1999; Trotter, 1997). Testifying before the Labor, Health and Human Services, and Education Appropriations Subcommittees of the U. S. Senate in 2001, Margaret Honey testified that there is evidence that the use of technology in education is beneficial. She stated in her testimony,

> After more than two decades of research on the benefits of educational technology we now have decisive evidence that technology use can lead to positive effects on student achievement. Specifically, in studies of large-scale statewide technology implementations these efforts have been correlated with increases in students' performance on standardized tests, software supporting the acquisition of early literacy skills – including phonemic awareness, vocabulary development, reading comprehension, and spelling – can support student learning gains. . . . In addition, we know that technologies offer teachers and students opportunities that would otherwise be extremely difficult to realize in classroom contexts (Honey, 2001, para. 3-4).

I believe that applying the multiliteracies theoretical framework within the learning environment of the early childhood classroom offers expanded learning opportunities for both teachers and children. Teachers have opportunities to expand their notion of literacy and what it means to be considered literate by including multiple modes of meaning making during their literacy instruction. Multimodality of literacy learning through the use of technology allows teachers to incorporate a wider range of teaching opportunities within their literacy teaching.

Children have opportunities to expand their ways of constructing meaning during literacy instruction. Multimodality of literacy learning through the use of technology during literacy instruction allows children to experience and participate in different types of formats for learning opportunities to broaden their learning styles.

Research Questions

To guide this study I selected four questions relating to teachers' perceptions and practices on using technology during literacy instruction in early childhood classrooms. I believe these questions are intertwined when technology is integrated into the literacy instruction of young children and the interaction between them adds to positive learning benefits that become available through the use of technology.

The four research questions are:

1. What perceptions do teachers have about using technology during literacy instruction in early childhood classrooms?
2. What technology are teachers using to facilitate literacy instruction in early childhood classrooms?
3. What modes of meaning making are being supported through the use of technology during literacy instruction?
4. What new literacies are being used during literacy instruction?

In this chapter, I provided an overview of multiple realities that can be used to examine the intersection of technology and literacy instruction, an overview of the multiliteracies theoretical framework that informed this study, and the research questions that guided this study. In Chapter 2, I review relevant literature of research on how technology has been used with literacy instruction, research on teacher perceptions on integrating technology, and how teachers

are utilizing new literacies in literacy classrooms. In Chapter 3, I describe the methodology I used to implement and analyze this study. In Chapter 4, I present case studies of my participating Kindergarten teachers, the results from my within-case analyses, and my cross-case analysis. In Chapter 5, I present implications of this study for research and practice.

CHAPTER 2

REVIEW OF THE LITERATURE

Holum and Gahala (2001) contend that there are two challenges facing educators when they look for evidence to support recommendations for using technologies in literacy instruction. The first challenge is what they referred to as the moving target problem. In describing the moving target problem they state,

> Even as researchers begin to describe empirical evidence supporting the effects a particular technology on an educational practice, that technology itself is changing and in some cases even becoming obsolete. . . the evolving nature of educational technologies precludes any efforts to predict the success of, and establish guidelines for, subsequent educational practices (para. 9).

The second challenge is a scarcity of comprehensive literacy studies. They contend that there are relatively few thorough studies evaluating the efficacy of new technologies for literacy education. They refer to a review done by Kamil and Lane (1998) that examined literacy research from 1990-1995 and looked in the four literary journals with the highest citation rates for literacy research: *Reading Research Quarterly, Journal of Literacy Research, Written Communication*, and *Research in the Teaching of English* (Holum & Gahala, 2001, para. 10). Kamil and Lane found only twelve research articles about technology and reading and writing out of 437 articles published (Kamil, Intrator, & Kim, 2000). Results for the reading journals showed only 1% of the articles published dealt with technology issues. Results for the writing

journals showed only 5% of articles published in them dealt with technology issues (Holum & Gahala, 2001).

Kamil, Intrator, & Kim (2000) contend that the history of the use of computer technology with reading is a short one. They call reviewing research about literacy and technology a conundrum since literacy and literacy instruction are technologies themselves though generally technology refers to using computer technology and disregards other forms. They discuss the reviews that have been done on the use of computer technology with literacy in the *Handbook of Reading Research* Volume III.

Reviews on using computer technology have appeared in the *Handbook of Reading Research* Volume II and in the National Reading Conference (NRC) Yearbooks in 1967, 1982, and 1995. Reinking and Bridwell-Bowles' review in 1991 in Volume II focused on reading and writing. The reviews in the NRC Yearbooks each emphasized different computer uses. Spache's review in 1967 focused on using reading machines to train students to be able to read faster and better. Kamil's review in 1982 was during the "computer revolution" (p. 771) and focused on computer and software capabilities and emphasized using the computer as a tool in research and to teach reading. Reinking's 1995 review focused on what constitutes text and how technology alters that idea and was concerned with the future of literacy (Kamil, Intrator, & Kim, 2000).

Kamil and Intrator (1998) found 350 research journal articles published about reading and writing from 1986 to 1996 when they conducted a search for research involving literacy and technology. These studies ranged from the preschool to the university level.

Use of Computers With Literacy Instruction

The use of computers with reading instruction dates back to the mid-1960s (National Reading Panel, 2000). Atkinson and Hansen (1966-1967) studied the Stanford Computer-assisted

Instructional system and curriculum for teaching reading and were the first researchers to publish an article involving the use of computers with literacy instruction. Their article discussed the use of the Stanford Computer-assisted Instructional (CAI) system and a curriculum for teaching reading that was completely under the control of the computer so that a child could progress at his or her own pace. The CAI reading lessons were organized into six levels of difficulty and contained several types of instructional materials: (a) letter discrimination and identification, (b) vocabulary acquisition, (c) decoding tasks, (d) syntactic and intonation practice, (e) syntactic and semantic practice, and (f) information-processing tasks.

In this section of the review of relevant research literature, I examined studies that involved the use of computer technology in literacy instruction with younger children through the years. Of these studies on reading and writing involving technology that have been conducted during the last several decades, many used experimental or quasi-experimental designs and many of them involved using digital software programs to teach, to remediate, to reinforce and to assess literacy skills that are traditionally taught in classrooms through teaching method using print-based materials.

The studies examined could be categorized according to how the computers were involved with literacy instruction into seven categories: (a) Phonological Awareness, (b) Vocabulary, (c) Comprehension, (d) Spelling and Decoding, (e) Acquiring Early Reading Skills, (f) Writing, and (g) Electronic Books. At the beginning of each category, I show a representative list of studies that have investigated the use of computers within the category through the years. Then I selected a more recent study within the category to describe.

Phonological Awareness

A number of studies have investigated the use of computers on phonological awareness. These studies include Hurford (1991), Barker & Torgesen (1995), Wise, Ring, & Olson (1999), Howell, Erickson, Stanger, & Wheaton (2000), and Wise, Ring, & Olson (2000). Appendix A includes a chart showing the purpose and findings from each of these studies investigating computers and phonological awareness.

Mitchell and Fox (2001) examined the effectiveness of using two computer programs that were designed to increase phonological awareness. Learning to read the English language involves mapping the sounds onto the letters of the alphabet. To do this, children must develop awareness of phonemes heard in spoken language and acquire the knowledge of letter and sound patterns. Beginning readers, to be successful, must understand the use of letters to represent sounds and then use the letter/sound relationships to be able to identify and spell words. The purpose of this study was to investigate the effects of computer-administered instruction and traditional teacher instruction on phonological awareness of at-risk children in Kindergarten and First Grade.

Two highly interactive software programs were used involving the children in instruction and practice with rhyme identification, identifying beginning, middle, ending sounds in words, segmenting words into individual phonemes, and blending. Instruction is presented orally with no written text. Thirty-six Kindergarten and thirty-six First Grade children from six classrooms at each grade level participated. In this experimental study, the children were randomly assigned to one of three groups. Children in Group A received computer-administered phonological awareness instruction. Children in Group B received teacher-delivered phonological awareness instruction. And children in Group C were the instructional technology control group working

with mathematic and drawing software programs. Results supported the idea that phonological awareness can be enhanced and that computer-administered instruction could be an effective method for teaching phonological awareness for at-risk Kindergarten and First Grade children.

Vocabulary

Several researchers have conducted studies using computers for work on vocabulary. These studies include Leton & Pertz (1984), Davidson, Coles, Noyes, & Terrell (1991), Davidson (1994), Davidson, Elcock, & Noyes (1996), and Pinkard (2001). Appendix B includes a chart showing the purpose and findings from each of these studies investigating computers and vocabulary.

According to Boling, Martin, and Martin (2002), elements of the technological age often have influence on the instructional decisions teachers make in their classrooms. The role computers play in the reading development of the students they teach is one such decision. Today, many children come into the classroom having been exposed to multisensory concepts for most of their lives. Teachers in the classroom have the opportunity to bring in technology that incorporates multisensory learning into learning situations. The purpose of this study was to investigate whether a computerized multisensory approach to teaching reading would increase the vocabulary development of first grade children.

Ten boys and eleven girls from a first grade classroom were selected to participate and randomly assigned to the experimental or control group. The software used in this study was the *Wiggle Works* program that consists of trade books, audiocassettes, and a variety of activities on the computer. The teacher is able to individualize instruction for each child. Seven stories were selected for use in this study with a new story introduced every other day. The stories became

progressively more challenging as the days went by and ranged from the Kindergarten level to the Second Grade level.

The results showed that children using the computer demonstrated significant gains in their ability to recall more new vocabulary words. Children with lower reading ability did not seem to gain as much from this experience. The performance of the children who worked with the computerized instruction seemed to mirror their ability level in the regular classroom. Overall, the implications of this study were that a 20-minute time block using computer-based stories resulted in first grade children improving their vocabulary development. The children were able to learn the new vocabulary words at a faster pace with more accuracy with the computer than through the use of the direct instruction method.

Comprehension

Using computers to work on comprehension was investigated in studies by several researchers including Calvert, Watson, Brinkley, & Penny (1990), Matthew (1997), White & Kuhn (1997), and Topping & Paul (1999). Appendix C includes a chart showing the purpose and findings from each of these studies investigating computers and comprehension.

Cuddeback and Ceprano (2002) studied the use of the Accelerated Reader program with early readers. Accelerated Reader is a computer-based reading and management program designed for students in grades K-12. Accelerated Reader data measures three aspects of reading practice for students: quantity, quality, and challenge. Quantity refers to the number of books students read and the number of points they earn. Quality refers to how well students score on the tests. Challenge refers to the relationship between the difficulty of the books students read and the student's tested reading ability.

The purpose of the study by Cuddeback and Ceprano (2002) was to determine if Accelerated Reader was beneficial to the development of young, struggling reader's comprehension. Participants in the study were twelve children from a high-need school who did not meet the school district promotion benchmark score after completing first grade. These children were randomly assigned to three different summer school classes. The summer school class using Accelerated Reader was held for four hours per day, four days a week for a period of four weeks. Children spent 30-40 minutes using Accelerated Reader for three days. On the fourth day the children were expected to answer questions pertaining to story grammar elements of their favorite Accelerated Reader book. When the children were not working with Accelerated Reader, they received direct instruction in phonics, sight words, using context clues, and math. The children completed a survey during the last week of the program.

Overall, Cuddeback and Ceprano concluded that Accelerated Reader contributed to the children's improvement in reading comprehension when it was used along with other reading materials and teaching procedures. The researchers felt that Accelerated Reader by itself was motivating for the children but it could be made more effective by coupling it with "instructional directives that promote comprehension improvement – both literal and higher-level" (p. 95). Accelerated Reader was perceived as a kind of "jump start" (p. 93) to get some of these students into reading books.

Spelling and Decoding

Several researchers investigated the use of computers for spelling and decoding. These studies include English, Gerber, & Semmel (1985), Jones, Torgeson, & Sexton (1987), Cunningham, & Stanovich (1990), Wise, Olson, & Treiman (1992), and Scrase (1997).

Appendix D includes a chart showing the purpose and findings from each of these studies investigating spelling and decoding.

According to van Daal and Reitsma (2000) because multimedia computer programs provide opportunities for training beginning reading and spelling skills, they conducted two pilot studies to examine the program's efficacy and impact on motivation of the children who use it for learning to read and write. A group of Kindergarten children and a group of reading-disabled children having motivational problems used a computer-based reading and spelling multimedia program that used digitized speech to provide the children with supportive feedback and a flexible control system allowing it to adapt to the children's abilities and skills as they increased. Exercises included: (a) matching pictures with spoken words, (b) indicating where a sound is heard in a spoken word, (c) indicating which letter sound is heard, (d) pointing at a requested letter within the context of a word, (e) filling in a missing letter, (f) matching written words with pictures, (g) selecting a word by its sound, (h) spelling a word that is already written on the screen, and (i) spelling a word by its sounds (p. 184).

The purpose of the first study was to examine how children at the Kindergarten level could independently acquire initial reading and spelling skills through the use of computer-assisted practice. It was hypothesized that the children who practiced using the computer would learn more with respect to their reading skills than the children who did not have access to the computer.

Twenty-one Kindergarten children in a primary school in the Rotterdam region of the Netherlands were selected to participate in the first pilot study. Nine children were assigned to the Experimental group using the computer-based reading program. Thirteen children were assigned to the Control group who had no access to the computers. At the end of the school

year, all the children were assessed using three posttests: (a) naming letters, (b) a standardized Dutch test for word recognition, and (c) a standardized Dutch non-word reading test to measure decoding skill.

The overall conclusion was that the children in the Experimental group had improved on letter naming and could read more words and non-words than children in the Control group after working with the computer.

In Study 2, the researchers investigated "if the difficulty of the reading and spelling practice is matched to the level that the individual is able to accomplish – i.e. if you control your own learning process – there is more chance of experiencing success at reading" (p. 188).

Three girls and eleven boys from classes in a primary school for learning-disabled children were selected to participate. The children worked with computer-assisted spelling exercises for at least five minutes per day, at least three times a week for half the school year. A standardized spelling test was given before and after the training. The children were also observed twice while they were working individually with the computer and in the classroom during a language lesson.

Learning effects were assessed through a standardized dictation-spelling test consisting of blocks of 15 words presented in a sentence to be sure the meaning of the word was clear which the children were required to write before and after the training. Motivation levels were assessed by using the Coping Analysis Schedule for Educational Settings (CASES) system that includes positive and negative scales of behaviors such as destruction and aggression, drawing attention, frustration, manipulating others, unnecessarily requesting help, obstruction, distracting others, and daydreaming.

The researchers felt that from the results of the first study showed that instruction and practice with computers at the beginning of primary education was a promising approach for three reasons: (a) the computer allowed a child who is ready to learn to read and spell to do so in an efficient way, (b) using the computer could enable more able children to become largely independent of their teacher, and (c) the computer could act as a diagnostic tool to identify children who have not acquired elementary reading and writing skills and then give remedial help. They felt in the second study children with low motivation and who were unsure of their ability to learn demonstrated more positive behavior during practice with the computer but less during instruction in the classroom. Overall these researchers believed that while the teacher's role is to make the learning process as meaningful as possible, for some learners the computer may be a powerful way to have learning opportunities that are more independent and teacher-free.

Acquiring Early Reading Skills

Studies using computers for acquiring early reading skills were conducted by Goodwin, Goodwin, Nansel, & Helm (1986), Gore, Marrison, Maas, & Anderson (1989), Boone, Higgins, Notari, & Stump (1996), Erdner, Guy, & Bush (1998), and Blok, Oostdam, Otter, & Overmaat (2002). Appendix E includes a chart showing the purpose and findings from each of these studies investigating computers and acquiring early reading skills.

The study by Mioduser, Tur-Kaspa, and Leitner (2000) examined the unique contribution of computer-based instruction compared to more conventional instruction for the acquisition of early reading skills by children with reading disabilities. The researchers were particularly interested in features of the computer that could possibly support the learning needs of these children such as digitized speech to enable association between letters and sounds, touch-screens

that allow the child to hear the sound of a letter or word by touching the screen, and individualization of instructional sequencing and feedback based on the child's learning pace, motivation, and self-confidence.

Forty-six children who attended six special education kindergartens in Israel were the participants in this study. They were randomly assigned to three groups. Group 1, consisting of 16 children, received reading instruction using a special reading program that included print-based and computer-based materials. Group 2, consisting of 15 children, received instruction with only the print-based materials from the special reading program. Group 3, consisting of 15 children, acted as the control group and received the regular special education program without specific reading instruction.

Results from the study showed significantly more improvement on the phonological awareness test, the word recognition test, and the letter naming test for the group using the intervention program involving computer-based materials (Group 1) compared to the other two groups. The children in Group 1 seemed to benefit from the computer-based work at specific skill levels and there was also improvement in terms of their motivation and self-confidence. The researchers concluded that the contribution of the computer-based materials toward acquiring early reading skills for at-risk children was very promising.

Writing

Writing involving the computer studies were conducted by Chang & Osguthorpe (1990), Borgh & Dickson (1992), Cohen (1993), Chambless & Chambless (1994), and Lachs & William (1998). Appendix F includes a chart showing the purpose and findings from each of these studies investigating computers and writing.

Barrerra, Rule, & Diemart (2001) conducted a study in a first grade classroom to investigate the effects of writing on the computer versus writing by hand for the same students. Eighteen students of varying abilities from a self-contained classroom participated in the study. The researchers had two hypotheses. The first hypothesis was that students who used computers to write compositions would generate more words and sentences. The second hypothesis was that students would be more engaged in writing activities when they used computers.

During September, the teacher taught computer skills including keyboarding and allowed the children to become familiar with the six computers in the classroom. The teacher integrated instructional software into the curriculum. Each child spent time at a classroom computer working on a variety of subjects and was able to use the computer lab twice a week for 25-minute sessions. Three programs for writing were used. The children worked on word-processing skills when working with the *Writing and Publishing* program, got ideas and motivation for writing through using the *Wiggle Works* program, and learned about editing by using the *Stories and More* program. As part of their writing instruction, the children composed class stories during whole group instruction. The teacher modeled writing techniques and phonetic spelling skills for the children.

Starting in October, the children began writing stories and other compositions on their own. All the children participated in writing instruction that including teacher-led prewriting preparation that provided information that could be used in their writing, had ten minutes for individual prewriting activities, and had twenty minutes for writing. A writing topic was chosen daily from a bank of possible subjects. The topics were related to current events, literature in the classroom, student interests, or topics connected with the curriculum. Writing assignments alternated between handwritten assignments done in the classroom and computer written

assignments done in the computer lab. The children worked on the same assignments during the same 20-minute period. Handwritten assignments were collected and dated. Computer assignments were saved on the computer in files and printed out later. Weekly writing assignments were collected from October through May. Forty to forty-four different writing assignments were collected for each student.

Writing scores were used to assess effects of using computer word processing and handwriting assignments. The number of words written was counted on each student's composition. The number of sentences in each composition was also counted. The teacher also kept track of off-task behavior for children during writing time. Off-task behavior was defined as sitting for more than a minute while writing, playing, or talking about non-writing issues to other children.

Results showed that the first hypothesis was confirmed. When students used computers to write compositions, they consistently wrote more words and sentences. Results did not support the second hypothesis. Children in this study did not show any particular preference for writing on the computer versus writing by hand. The lack of differences in off-task behavior observed seemed to indicate that children performed better using the computer because computers offered features that supported the children's writing not because the computers were more engaging.

Electronic Books

The use of electronic books was investigated in studies conducted by Boone & Higgins (1993), Miller, Blackstock, & Miller (1994), Chu (1995), Adam & Wild (1997), and de Jong & Bus (2002). Appendix G includes a chart showing the purpose and findings from each of these studies investigating computers and electronic books.

Lewin (2000) conducted an exploratory study concerned with electronic books being used to supplement literacy instruction. Two versions of talking book software were compared. Basic format electronic books incorporate features such as whole word pronunciations of words or phrases being highlighted as spoken, reading the story aloud, and page turning capability. Enhanced format electronic books incorporate segmented feedback, reinforcement activities, and the capability of giving hints to the reader. Talking book software can be used to support an integrated approach to literacy instruction. It provides exposure to text in an alternative format and provides opportunities for instruction to be contextualized. Twenty books were available consisting of twelve books designed to develop sight recognition of vocabulary introduced at each stage and eight books designed to develop phonological awareness at the onset and rime level. Five types of activities were used to provide instruction in the use of reading cues such as initial sounds, illustrations, meaning and syntax, and sight word recognition. This study comparing the effectiveness of the enhanced format versions to the basic format versions was conducted in a naturalistic setting. Sixteen pairs of children were matched on reading age, class teacher, and gender. Then they were randomly assigned to the Basic or Enhanced software groups.

Results for the first purpose of the study showed that teachers gave favorable comments about the hint capability and the reinforcement activities of the Enhanced version. The electronic books complemented what was done in the classroom and were well received by the teachers. Most of the children enjoyed the activities and the activities were able to extend the children's attention and concentration during reading. The software allowed the children to read the pages at their own pace. They could request support from the computer as much or as little as needed. Neither group experienced difficulty learning how to use the software and required little support

from the teacher. Results for the second purpose on word recognition showed the Enhanced software group made greater gains in key word recognition. Results for the third purpose on motivation and self-confidence showed that the Enhanced version users may have developed a more negative attitude toward reading while the Basic version users kept a positive attitude. This study showed that both versions of the electronic book software were beneficial for children. The electronic books complemented the goals of the teachers. Teachers and children were both positive about the software. For lower reading ability children, the Basic version was successful in improving sight vocabulary words. The Enhanced version was effective for children who had already acquired some sight vocabulary. For higher reading ability children, providing hints supported independent word recognition.

Teacher Perceptions About Using Technology

It is known that how teachers approach teaching is influenced by a number of factors including their personality, belief system, education, teacher training, and experiences. According to Becker (1991), “To create an intellectually rich school environment that incorporates technology, it is necessary to be aware of ‘old habits’ and ‘conventional beliefs’ that impede the best intentions to improve schooling through technology by practicing teachers” (p. 6). In this section of the review of relevant research literature, I examined studies on teacher’s perceptions about integrating technology.

A study conducted by Honey and Moeller (1990), explored teachers’ thinking on how and why teachers do or do not use technologies in their classrooms. These researchers were interested in seeing if there were patterns in teachers’ pedagogical beliefs, how teachers talked about what they did in their classrooms, and their instructional objectives that either facilitated or kept them from integrating technology into their curriculum. A second interest was in what

would enable teachers and schools to integrate technology into the classroom environment in meaningful ways. This study included twenty teachers who either used or did not use computer technology in their classrooms in two school districts.

Results found that the teachers could be grouped into four groups: (a) Progressive Practice and Successful Technology Integration, (b) Progressive Practice and Technological Ambivalence, (c) Traditional Practice and Technological Reluctance, and (d) Progressive Practice and Lack of Opportunity. The analyses of the interview responses looked at general topics within each teacher group such as classroom practices and objectives, teachers' perceptions about students and themselves, how teachers conceptualized the relationship between technology and education, how technology was integrated into their curriculum, factors that facilitated the integration process, barriers that kept them from integrating technology, and how teachers envisioned classroom environments of the future.

Progressive Practice and Successful Technology Integration

Teachers in the Progressive Practice and Successful Technology Integration group were skilled professionals who engaged in practices such as collaboration, project-oriented work, and hands-on activities with students in their classrooms. They wanted their students to develop a sense of curiosity and a desire to learn. They used methods geared toward meeting the needs of individual students as well as collaborative group work. They believed that students needed to be able to think critically and favored inquiry-based or discovery learning by their students. These teachers thought of all students as learners with different styles of learning and learning needs. They described themselves as learners and how their teaching practices have changed over time. They stressed the importance of developing and changing how they responded to their students' needs. They talked about how they sometimes stopped using the traditional textbook in order to

engage their students in project-oriented and/or group activities. They tended to worry less about doing a perfect lesson and used more problem solving with their students. To these teachers, the relationship between technology and education was extremely feasible and productive. They felt that technology was most valuable when it was thought of as a facilitating tool to support and enhance activities that were happening in the classroom. Technology and the curriculum influenced and enhanced each other in their view. Many teachers in this group believed that technology is an inevitable fact of contemporary life and that for students to be competitive in society they have to be comfortable with using technology. All these teachers were motivated and worked hard to integrate the technology into the curriculum and used it as an integral part of their regular class work. They worked with software that supported their pedagogical beliefs and enhanced or facilitated specific objectives in the curriculum. They believed that the use of technology could make learning fun and meaningful and at the same time expand students' horizons. All of the teachers felt that it was important to have administrative and district support for their work with technology programs. All of these teachers used computers outside of school as part of their personal life.

Progressive Practice and Technological Ambivalence

Teachers in the Progressive Practice and Technological Ambivalence group were much like the teachers in the Progressive Practice and Successful Technological Integration group when they talked about what they did in their classroom practices and their instructional objectives. They tried to create a feeling of satisfaction for the work their students successfully accomplished, for the work they were capable of accomplishing, and a generally good attitude toward learning. They said that their teaching practices changed and evolved over time. They moved from traditional methods to more interactive and interpretive methods. They thought it

was important to learn from their students and then use what they learned to modify their classroom practice.

In terms of their pedagogical beliefs, these teachers sounded very much like the teachers in the first group, however, their feelings of reluctance toward getting involved with computers came from a personal ambivalence about the technology. They felt more relaxed and trusted their students. The way these teachers thought about the relationship of technology and education was affected by their lack of examples for how technology is, and can be, used in their subject area or grade.

Traditional Practices and Technological Refusal

The pedagogical beliefs and classroom practices of the teachers in the Traditional Practices and Technological Refusal group followed a more conventional philosophy about education. They used traditional methods in teaching that included following the textbook and lecturing. These teachers put less emphasis on learning as a process and more on having their students' ability to pass tests. They felt that they did not make changes in their teaching. They continued to teach in the same way they had taught before and only made changes regarding what they were required to teach. They divided their students into two groups, those who wanted to learn and those who had no interest in learning and had given up.

This group was characterized by conservative beliefs and these beliefs influenced how they thought about the relationship between technology and education. They often felt that the most productive way technology could be used was to reinforce basic skills or increase student motivation. Technology was seen as an add-on to the curriculum rather than as a way to enhance the curriculum.

Progressive Practice and Lack of Opportunity

The educational beliefs and classroom practices for the Progressive Practice and Lack of Opportunity group teachers were very much like the other teachers who used student-centered teaching. These teachers felt that the way they taught had changed over time.

Even though they thought the use of technology in teaching was a good idea, they had not been involved with using computers because of scheduling difficulties and not enough computers. They had a limited understanding of how to incorporate technology into their students' work.

Overall, the findings of this study showed that there was a relationship between teachers' education goals and objectives and the way they were able to integrate computer-based technology into their teaching practices. Educational beliefs played an important role in how teachers chose to make use of technology in the classroom.

Hadley and Sheingold (1993) conducted a nationwide survey of 608 teachers who were experienced at integrating computers into their teaching. The researchers were interested in who these teachers were, how these teachers used computers in the classroom, how the teaching of these teachers changed, and what barriers and incentives these teachers experienced.

Results revealed that teachers that have incorporated technology into their teaching believe they have transformed their teaching practice. Three factors stood out as having contributed to these teachers' achievements. The first factor was the teachers' motivation and commitment to student learning in their own development. These teachers made a professional commitment to using computers and learned how to use them effectively in their teaching. Their motivation appeared to come from their belief in the value of the technology for their students and from what they saw happening in the classroom. They were inspired by their students'

accomplishments using the technology and the enthusiasm shown by their students about the technology. In general, the teachers were motivated by the opportunity to learn new skills for using the technology. The second factor was the support and collegiality the teachers received for integrating technology. On-site support and relationships with colleagues were shown to be important ingredients to successfully using technology. The third factor was having sufficient access to technology. It was the access to the technology that made these teachers' accomplishments possible.

According to Hadley and Sheingold (1993), a teacher's willingness to learn and change is a central element in the integration process. There is no simple formula for integration and what the results point to is that "teachers who have learned how to integrate technology flexibly into their own teaching practice have achieved something very important, for themselves and for their students" (p. 300).

Olech (1999) conducted a study to examine the relationship between elementary teachers' beliefs about the nature of knowledge and knowledge acquisition and their level of computer use in their classroom. This study also investigated whether four personal characteristics of teachers: (a) teacher innovativeness, (b) computer relevance, (c) computer self-competence, and (d) subjective norms, were predictive of their level of computer use.

Data was collected from 101 elementary classroom teachers. To be included as a participant teachers had to have at least two years teaching experience in an environment that provided access to computers. In the school district, each second through fifth grade had four to five computers on a network server that provided access to an integrated learning system, a multimedia encyclopedia, desktop publishing, a presentation program, email, and word processing programs. Additional educational software on floppy disks was available. A

questionnaire containing 57 items was used to collect data. This questionnaire assessed teachers' beliefs, level of computer usage, innovativeness, computer relevance, computer self-competence, and subjective norms. Information was also collected on age, gender, teaching assignment, grade level, teaching experience, computer experience, and computer ownership.

The questionnaire used a 6-point Likert response format indicating the degree of agreement with statements. To assess the pedagogical beliefs of the teachers, three sets of items were used on the questionnaire and these items gave three scores for each teacher - behaviorist score, information processing score, and constructivist score. To assess the teachers' level of computer use, teachers responded on how they viewed computers for achieving classroom goals. To measure teacher innovativeness, questionnaire items asked teachers to make judgments about their innovative activity. For computer relevance, teachers were asked to rate their agreement on a statement that computers were relevant to teaching. A higher score indicated a stronger perception on the relevance of computers to teaching. To measure computer self-competence, teachers were asked to rate their agreement on their capability of using the computer competently in their teaching. Higher scores indicated that teachers perceived themselves capable of using a computer. For subjective norms, teachers were asked to rate their perceptions of the expectations about computer use by building principals, district administrators, other teachers, students, and parents. Higher scores indicated a stronger perception that other people associated with the school expected computer use during instruction.

The researchers concluded that teachers tended to have eclectic pedagogical beliefs but exhibited tendencies toward constructivist beliefs. If a teacher's stance was more toward behaviorist, the teacher was less likely to use computers. Teachers with more behaviorist views seemed to have the least interest in using computers for instruction. Another conclusion was that

pedagogical variables did not add significantly to predicting the level of computer use. Computer relevance, computer self-competence, and innovativeness all had negative correlations with behaviorism. Innovativeness and computer self-competence had a significant and positive correlation with constructivism. The belief teachers had about how knowledge is acquired was the most predictive for the level of computer use the teacher attained.

A study by Guha (2001) explored elementary grade teachers' experiences using computers during instruction and the role the teachers would like to see computers have for instruction. The purpose of this study was to examine elementary grade teacher's training and knowledge in computers, comfort level in using computers for instruction, and computer uses in classroom teaching.

Fifteen elementary schools were randomly selected from two western New York counties. Survey questionnaires were distributed to 200 teachers. One hundred and forty-nine surveys were completed and returned. Of the teachers who responded, 124 teachers were female and 25 teachers were male. The majority of teachers taught at the PreK-3 grade level. Teachers had varying levels of teaching experience; 30 teachers had less than five years of teaching, 33 teachers had been teaching between six to ten years, and 86 teachers had been teaching for more than ten years. Thirty-two teachers held a bachelor degree and 117 teachers held a master's degree.

The questionnaire consisted of 37 close-ended items. Questions were divided into three sections. The first section consisted of seven questions measuring teachers' perceptions of their computer training and knowledge. Teacher responses reflected their opinions on the training opportunities that they were offered within or outside the school district, their views on their school's technology resources, technical assistance that was available, and perceptions about

their computer knowledge. The second section asked about teachers' comfort in using the computer. Teacher responses reflected their beliefs in enhancing teaching abilities through computers, levels of interaction with students relating to computers, and self-assessment on the effect of computer-aided instruction on their teaching methods. The third section explored teachers' computer usage. Teacher responses reflected their views on using computers as a tutorial or for updating student records, their use of computers as a tool for email purposes or retrieving Internet information, the extent of their use of computers to help students create and use presentation graphics, and the extent they planned curriculum instruction with integration of technology. Questions were formatted so teachers were allowed to respond to their present situation and to a preferred situation using a 5-point scale.

This study gathered data to compare elementary grade teachers' perceptions regarding their perceptions on computer training, feelings of comfort with computers, and computer usage in present classroom situations and what they considered their preferred situation to determine whether they felt that the status quo was acceptable or if they saw a need for change.

Results obtained from the responses by the teachers showed that teachers wanted to receive more computer training than they received now, teachers wanted to feel more knowledgeable with computers than what they are now, and teachers wanted to be more comfortable in using computers than they are now. There was a positive correlation found between computer training and using computers in classroom instruction in both present and preferred situations. Another positive correlation was found between teachers' perceived computer knowledge and computer usage in both situations. And a third positive correlation was seen between their feeling comfortable with computers and computer usage in both situations.

Guha (2001) came up with three conclusions. First, that all elementary teachers should be proficient with computers and competent in using computers in their teaching. Second, because of rapid technological changes, schools need to update their resources and continue to provide training and workshops for teachers. And third, school districts need to create a plan to make the resources available to all schools to promote equality in the schools.

In 2006, a study by Wozney, Venkatesh, and Abrami investigated personal and school characteristics, teacher attitudes, and computer technology practices of elementary and secondary teachers. The purpose of this study was to examine the relationship between motivational, instructional, and school factors that have an impact on the nature and frequency of integrating computer technology in schools.

A Technology Implementation Questionnaire was developed for this study using a six-point scale from “strongly disagree” to “strongly agree” to allow for greater variability in the responses. The questionnaire was made up of five sections. The first section consisted of 33 items about attitudes and beliefs towards the use of computer technology. The second section included seven questions about personal and school demographics. The third section consisted of three items about teachers’ proficiency with and use of computers. The fourth section included twelve items about functional purposes or instructional uses for computers in classrooms and to identify teachers’ perceptions of how they see their integration of technology. The last section involved two open-ended questions on teachers’ views of how to reallocate technology resources to improve instruction uses of computers. The questionnaire was available in both French and English.

The Technology Implementation Questionnaire was given to 2,213 elementary and secondary teachers in the province of Quebec, Canada. Seven hundred sixty-four teachers from

both private and public school sectors participated. Of the total number of participants, 488 taught at the elementary school level. Seventy-eight percent of the teachers were female. Eleven percent of the teachers worked in private schools. Twenty-three percent of the teachers completed the questionnaire in French. Teaching experience among the participants ranged from 1 year to 43 years and class size ranged from 3 to 40 students.

This study investigated how often computers were used in classrooms and the nature of that implementation. The researchers found that the implementation of technology is "a dynamic process mediated by subjective teacher characteristics and by conditions within the school" (p. 192). Significant correlations were found between how frequently teachers' integrated computers, how proficient teachers were using computer applications, and where teachers are in relation to the integration process.

Results pointed to demographic and setting characteristics related to computer use. The first finding dealt with teaching styles. Teachers who preferred a more student-centered teaching approach were more likely to integrate computer technologies more frequently, perceived themselves having a higher level of computer proficiency, and reported themselves as more sophisticated at integrating computers in classrooms. The second finding dealt with the frequency of computer use outside of teaching activities. A teacher's personal use of computers outside of teaching activities was found to be the strongest predictor for the use of technology in the classroom. Teachers' access to computers at home influenced computer use in the classroom. The third finding dealt with the amount of technology training. The amount of in-service technology training was significantly related to computer use in the classroom. Teachers reported a need for in-service training and felt that the training should include applied training that goes beyond basic technology skill development. The fourth finding dealt with access to computer

resources. One thing that continued to be a predictor of technology integration in the classroom was student access to computer resources.

Another 2006 study by ChanLin, Hong, Horng, Chang, & Chu investigated how teachers integrated technology into creative teaching. The purpose of the study was to investigate the factors that influence teachers' use of technology in creative teaching. Participants in this study were teachers who had won an award sponsored by the Chinese Creativity Development Association. This is an annual nationwide contest to reward creative teachers in primary and secondary schools in Taiwan and serves as an impetus to creative education. Eight teachers who won the Createach Award participated. These teachers were from different schools and taught in various teaching domains including mathematics, language arts, information technology education, arts and humanities, social studies, science and technology, and integrative activities. Four of the teachers taught at the primary school level and four taught at the secondary school level. Teaching experience of the participants ranged from two to twenty-three years.

Data was collected through field notes, interviews, videotaped classroom observations, and audiotape recordings. Various sources of data were used in order to gain a deeper understanding of the meanings participants attributed to their own actions and to the actions of others. Field notes were taken to record what happened during lessons during classroom observations. If a teacher was going to use a technology-intensive approach to a lesson topic, more frequent classroom visits were scheduled. Interviews used semi-structured, open-ended questions and were designed to collect descriptive data in a teacher's own words in order to develop insights about the teacher's perceptions and experiences. Topics included in the interview protocol included teacher's backgrounds, strategies used to encourage thinking and

activities, ways to get ideas for creative teaching, belief in using technology, and whether technology is used.

The use of computer technology in the classrooms reflected different levels of integration. Some teachers used it more intensively than others partly due to differences in their fields of teaching. Computers were used for presenting animation to help students with concepts of geometry. Student's problem-solving strategies were projected and the class discussed them. In social studies and science classes, project-based learning approaches were used. A task-oriented approach was used to encourage students to explore topics of interest to them, gather information for their research, organize what they found on the Web and in other resources, create their own knowledge, and make a presentation of their findings to the class. Artwork from websites was used to stimulate students' creativity in the arts and humanities classes. Creative work of the students was compiled into portfolios and stored on CD-Rom disks. Stories and metaphors were presented using PowerPoint to encourage students to react to questions presented regarding social relationships with people during counseling classes. The information technology class had the most access to the computers. Students in this class learned how to design web pages and use various multimedia tools. Students worked as a team to develop a website to present information about an issue, a place, or a person in collaboration with faculty members as content experts. Students were encouraged to actively participate in this work and consolidate their understanding of the content area while at the same time repackaging their knowledge and giving new form to what they knew.

To encourage learning creatively, teachers used different strategies and using computer technology was one of those strategies. Most teachers felt positive about using computer technology as a strategy for creative teaching. Most of the teachers felt that creative teaching did

not have to be involved with technology however technology might extend their use of creative teaching strategies.

Factors that influenced teachers' approaches to integrating technology into creative teaching strategies came out of the analysis of the data. These factors were categorized into four major areas: (a) environmental, (b) personal, (c) social, and (d) curricular.

Several environmental factors relating to computer facilities were frequently mentioned for influencing the use of technology and creative teaching. The willingness of teachers to try innovative teaching methods was influenced by whether a school had the budget necessary to support the use of technology. Whether a teacher had a computer and the Internet at home was seen as essential. Teachers were also concerned about what support was provided, how resources and personnel were managed by schools, the way time was allocated for using the computer lab, whether opportunities for training were provided, and if a teacher's initiative might be influenced through a policy to reward the integration of technology and creative teaching.

Personal factors relating to teachers' personality and beliefs had the potential to impact the use of technology and creative teaching. Beliefs about teaching, experience in using technology, and a teacher's interest to try new things affected teachers' willingness to integrate technology. Teachers were more likely to use technology in their classrooms when their personal lives involved using computers. Interest in using technology was often based on whether teachers used it to solve their personal problems, whether they used it to look for new ideas for implementing their instruction, whether they were really interested in their subject, or whether it was used to support the learning of knowledge in their subject area. Most teachers felt learning new technology helped their personal growth and integrating new technology ways into their

teaching, however, they found that more effort and time was required to integrate technology into their classrooms.

Social factors relating to an individual teacher's effort in using technology and creative teaching might play a role in creative teaching outcomes. Some teachers felt that having supportive working colleagues was important for doing a better job in integrating technology into creative teaching. Teachers felt that having a principal who was open to using technology and supported using technology along with having an atmosphere within the school with an open atmosphere was critical to encourage teachers to take the initiative to integrate technology. The achievements of students, getting support from parents, and having resource support from the community also affected the integration of technology and helped in supporting the teachers' innovative approach to teaching. Preparing students to have technological abilities for their future also had the potential to impact teachers' attitudes about using technology.

Curricular factors relating to the goals of a course, considerations about skills and literacy required in course activities, and how students' performance should be assessed were a concern of teachers. Teachers faced the challenge of integrating existing strategies with new strategies. Other concerns involved whether the use of technology was necessary for some learning objectives and activities and how much control of computer time they would have when it came to using technology. The key issue about using computer technology in their classrooms was better student learning.

These researchers feel that teachers have accepted the rationale for using technology in classrooms because the use of technology has become a trend for learning, but creative teaching does not have to be technologically oriented. Technology is only a tool that can be used in different ways depending on how teachers arrange classroom activities toward achieving

specified purposes. Teachers felt that incorporating technology into their classrooms requires training, technical support, administrative support, and incentives for its use. They concluded that through their attitudes, practice, and relationship and interaction with students, teachers play an important role for fostering the development of creative abilities. Factors influencing how computer technology is integrated with creative teaching are not only from the teaching environment and personal factors, but social and curricular factors also have an influence.

Using New Literacies

Leu, Kinzer, Coiro, & Cammack (2004) suggest that reading, reading instruction, and the conceived notions of literacy and literacy instruction are being defined by change as new technologies require new literacies to effectively exploit their potentials. New literacies change regularly as new possibilities for communicating and information technologies are developed. These researchers have identified ten central principles of a new literacies perspective that are emerging from the use of the Internet and other information and communication technologies (ICT): (a) the Internet and other ICTs are central technology for literacy within a global community in an information age, (b) the Internet and other ICTs require new literacies to fully access their potential, (c) new literacies are deictic, (d) the relationship between literacy and technology is transactional, (e) new literacies are multiple in nature, (f) critical literacies are central to the new literacies, (g) new forms of strategic knowledge are central to the new literacies, (h) speed counts in important ways within the new literacies, (i) learning often is socially constructed within new literacies, and (j) teachers become more important, though their role changes, within new literacy classrooms (p. 1589)

In many school districts, computers are considered an essential item in a modern classroom and computers are becoming more readily available and used in elementary schools

(Labbo & Reinking, 2003). The U. S. Department of Education reports the percentage of instructional rooms having Internet access has grown from 3% in 1994 to 93% in 2003. Results from the Computer and Internet Use supplement to the Current Population Survey in 2003 showed 80% of children in Kindergarten used computers with 32 % of that group using the Internet. For children in first through fifth grades, 91% used computers with 50% using the Internet. Schools have been expanding Internet Access into classrooms, computer labs, library/media centers, and other rooms used for instructional purposes. Labbo and Reinking (2003) feel that there has been steady, gradual movement towards getting computers integrated into instruction more fully and teachers are recognizing that new literacies skills used in daily life need to be addressed. In this section of the review of relevant literature, I examined studies and projects involving teachers and students with using new literacies.

Garner and Gillingham (1998) set out to study Internet-active classrooms. They collected data over the course of a year as they worked with six teachers using email in diverse settings. All of these teachers were enthusiastic about how their classes worked with the Internet. The first teacher was a fifth grade teacher. This teacher worked with another teacher and his class in Alaska to help her students develop a richer understanding of themes such as local community history than they could do using only school textbooks and so they could learn how to use language in new ways. From this experience, almost all of her students learned how to examine their own written communication for problem areas such as unconventional spelling and punctuation and ambiguity. The second teacher was a fifth- and sixth-grade teacher. The third teacher was a high school teacher. These two teachers used the Internet to give their students, children and adolescents, in the Yup'ik Eskimo tribe in Alaska opportunities to practice speaking and writing in English, their second language. The students wrote reality-based stories much like

the stories told by elders in the village to people outside their village which included the students in the first teacher's class. During their year of participation in this project, the teachers saw improvement in students' fluency in English, grammar, spelling, capitalization and punctuation. The fourth teacher was a seventh grade teacher. She taught in an area where the parents were not highly educated and students did not care about being successful in school and were not engaged in class. Many students planned to drop out of school after the ninth grade. She involved her students in an international email list where students posted messages and then read and replied to other messages. While they participated, many of her students were able to post strong arguments and evidence related to topics that were important to them. The fifth teacher was a high school teacher. He was looking for someone to participate in professional conversation with him. The fifth teacher and the third teacher began conversing at night. They conversed about their adolescent students, about what to teach and how, and about how unpredictable and uncertain teaching can be. These teachers used the Internet to counter the feeling of isolation and loneliness of teaching in the classroom. The sixth teacher worked with fourth and fifth graders. The teacher and her students had a website that included text, pictures, animated images, and audio clips. The students had opportunities to publish their work on the website and get feedback on it. The teacher prompted those who read the website to respond. They received responses from all 50 states and even other countries. The teacher also created electronic portfolios for all the students so correspondents who wanted to see more of a particular student's writing could access the work plus pictures and audio clips by clicking on the student's name.

Garner and Gillingham (1998) found three large changes in how the Internet activity transformed the six classrooms. The first change was the expansion of materials and methods the teachers had in their repertoire to use. Topics discussed between teachers included successful

questioning techniques, how to edit student messages, how to encourage creativity and imagination, how to make learning its own reward, requests for book titles and informative websites, and even how to encourage open, respectful conversation within the classroom. As trust developed between the teachers, they shared ideas of what worked for them with their students and what did not work. The second change was that teacher reflection was invigorated. The teachers engaged in reflection with each other as attachments to student exchanges and with the researchers. The asynchronous nature of the email medium let them receive messages during the day and reply when the school day was over or at home in the evening. The third change was that teachers began moving away from the transmission-oriented pedagogy. This was especially evident in the sixth teacher's class where her fourth grade students used the World Wide Web as a place to publish their work and as a source of information. The teacher used the Internet to learn about a tragedy at the Philadelphia Zoo. The children then used the Internet do some research about the event and do some persuasive writing giving their positions for or against keeping animals captive in zoos. The Internet was an outlet for publishing the students' arguments for or against this issue. Readers were able to write to the students about their writing.

Garner and Gillingham state that they have "considerable faith in the wisdom of most teachers" (p. 230). They feel that if teachers were given the opportunity to discard old models of transmission of knowledge and change in favor of constructing knowledge via the Internet network, they will do so.

A study by Reinking and Watkins (2000) was a formative experiment to investigate how a computer-based instructional intervention of creating multimedia reviews of books might be implemented to achieve the goal of increasing the amount and diversity of elementary student's independent reading. A formative experiment investigates how an intervention can be adapted to

respond to factors that either enhance or inhibit its effectiveness to achieve a pedagogical goal. The pedagogical goal for this study was to increase the amount and diversity of independent reading done by students. The instructional intervention, designed by the investigators, was to use multimedia book reviews to increase independent reading as an alternative to the conventional book report. Student completed multimedia book reviews after reading books they selected for independent reading. The reviews created on the computer included graphics and sound to accompany text and were compiled into a searchable database. The database of book reviews was available to students, teachers, parents and others in the school by having it in the school media center. This study took place in three elementary schools over a two-year period; two schools for the first year and the third school for the second year. One hundred forty-nine children in fourth- and fifth-grade classes participated in the intervention classrooms. Forty additional children participated in two comparison classrooms. All the teachers had some background with computers in their teaching, but the amount and type of experience varied. They were all, however, using the computer with their teaching activities in some way.

Qualitative and quantitative data was collected during the first 6 weeks of school to gain an understanding of the students, teachers, classrooms, and schools and to establish a baseline for comparing the amount and diversity of independent reading done by the students. In order to determine what factors were enhancing or inhibiting the effectiveness of the intervention toward the goal and to guide any modifications, qualitative data was gathered from semi-structured interviews with teachers, teacher log books containing observations about events that happened related to the project, focus group discussions by teachers and students, field notes, videotapes of project activities, and student work. Four focus children were identified in each classroom representing above-average reading achievement and interest, above-average achievement and

below average interest, below-average achievement and above-average interest, and below-average achievement and interest.

From the qualitative data, it was seen that interaction with peers was greater during the multimedia book review activity. Interactions during the project seemed to generate more of a sense of camaraderie and students seemed more interested in the achievements of classmates and what they were developing. Many students gained quite a bit of technological expertise and other students looked to these experts during the project. Student to student interactions played a major role toward reaching the goal of the study. Interactions between teachers and students were also affected during the creation of the multimedia book review activities. Teachers often became learners while the students taught them how to work with some of the technological aspects of the project. With regard to reading achievement, the researchers found that creating the multimedia book reviews tended not to make differences in reading achievement apparent. Many low-achieving children seemed to gain confidence and self-esteem from working on the computers and this confidence seemed to have a positive effect on their involvement in literacy activities.

The effects of the instructional intervention varied among the classrooms. Four factors seemed to explain the difference between two of the schools. First, the professional climate of the schools was distinctly different. Second, one school's teachers thought they were not getting as much attention from the researchers as the other school. Third, the teachers at one school seemed to be more conscious of whether the activities were meeting the expectations of the researchers and whether the study was being conducted properly. And fourth, implementing project activities within their own classrooms might have reduced the need for planning, cooperation, and support among teachers.

Teacher attitudes toward technology revolved around their role in the project activities. The teachers fell into several different identifiable roles: (a) the Technology Expert, (b) the Marginal Technology Expert, (c) the Facilitator, and (d) the Passive Participant. The Technology Expert role included teachers who assumed this role early in the project. They had greater interest and were quickly successful in learning how to use the hardware and software. They had a greater commitment to working on the computer beyond what was minimally required. Other teachers often acknowledged them for being in this role. The Marginal Technology Expert was the teacher who was enthusiastic but passive at the beginning of the project. Gradually, they seemed to become more comfortable using the technology. As they became more comfortable, they became more enthusiastic about the effects of the project. The Facilitator Teacher was not very interested or intrigued by technology, but was interested in the non-technological effects of the program and tried to connect other classroom activities with the intervention. The Passive Participant seemed to be enthusiastic about the project and the possible benefits, but needed explicit directions and guidance from others. This teacher did not make a personal investment into the project, did not engage in creative problem solving to address practical or logistical problems, and did not think about the possibility to extend or adapt the multimedia book review activities with other curriculum areas. This teacher did not put forth much effort to master the technology and had a low tolerance for things that prevented the activity from meeting their expectations.

One prominent finding of the study was that students paid more attention to their writing. They seemed conscious that other students and adults would use the multimedia book reviews they were creating. A second finding was that participation in this project promoted professional involvement by the teachers. All the teachers presented at professional conferences, one teacher

entered an advanced degree program, and several teachers expressed that they felt these activities were professionally meaningful and rewarding. A third finding was that parental involvement in the classroom and in the school increased because literacy and technology seemed to be important topics to parents. A final finding was that the project increased students' and teachers' awareness of electronic forms of reading and writing and there was some evidence that their familiarity with how texts might be incorporated with other media to create electronic documents was carried over to other reading and writing tasks.

Reinking and Watkins (2000) concluded that the multimedia book review activity did contribute to advancing the goal of increasing the independent reading of students. The time and effort devoted to helping teachers and students learn the technology software program was important to enhancing that goal. They also concluded there was evidence of positive instructional transformations occurring, although the degree to which it was happening differed from teacher to teacher and school to school. They speculated that there were several factors that affected the transformation in the interaction patterns in some teachers but not in others. The first factor was the active involvement and leadership of a teacher who assumed the technology expert role. The second factor was the supportive, collaborative teachers and administrators in the school environments that encouraged independent thinking and flexibility for being able to meet instructional needs. The third factor was that sufficient access to hardware and support added a dimension for considering the role of technology in literacy instruction.

Yost (2000) began using email in her Kindergarten classroom to support the emergent writers in her class. As an early childhood teacher, she was looking for a way to give her children opportunities to write in authentic and meaningful ways.

Traditionally, the tools young children in early childhood classrooms use for writing include pencils, crayons, markers, pens, or paints. According to Yost, computers add another tool to these writing implements. When the children were writing email messages, Yost used multiple ways to scaffold what they were writing. These options for scaffolding included: (a) writing using sound spellings independently, (b) requesting sound spelling assistance from the teacher or another child, (c) requesting assistance with their writing from the teacher when they get tired of writing, (d) asking the teacher to write the words so they could copy the writing, and (e) asking the teacher to act as a scribe while they dictated a story (Yost, 2000).

Yost began this classroom activity by sending a letter to the children's parents discussing the project as part of her writing program and requesting the parents send in information about family members or friends who would be willing to and enjoy communicating with their child via email. The information she received was compiled into a set of classroom email directory pages using Netscape Composer and she created several web pages.

The first web page contained a list of the children in the class. Each child's name was linked to an individual email directory page. Each individual child's email directory page had a list of email names available for that child. When children wanted to write an email to someone on their individual email directory page, they clicked on the person's name that was linked to an email composition window. The email composition window was already addressed and was ready for the children to add the subject line and message. According to Yost, children learned to use these web pages and the email program with a minimum of instruction.

The children in Yost's classroom usually wrote email before school and during center time. The children were asked to read their individual email messages or have their messages read to them, but whether the children responded to a message was left up to them. While the

children were writing, the teacher or student teacher documented the children's writing behaviors. When the children chose to write a message, the first thing all the children were required to type was their name in the subject line. Then they typed their message.

Yost identified three styles the children used for writing their messages. The first style involved simply typing random letters. These children were beginning to develop an understanding that text has meaning and the words are made up of letters, but did not have an understanding of the letter/sound relationship. While observing the children creating this type of message, the teacher or student teacher wrote down as a dictation in their notes what they heard the children saying as the message was typed. The children sent their messages and then the teacher sent a second message to the same person with the dictated message so the message recipient could read what the children wrote and respond appropriately to the message the children sent. The second style involved typing strings of letters, but the children had actually sounded out the words they wrote. These children were beginning to develop an understanding of letter/sound relationships but did not use spaces between words. The third style involved writing in complete sentences. These children were beginning to develop an understanding of punctuation and capitalization though they may not use what they know.

In order to document the children's work, Yost developed a set of questions to be consistent in their observations and documentation. A copy of a child's email message was attached to the documentation form and filed in their individual portfolio. This allowed Yost and the student teacher to look at the child's writing development over time during the school year.

Yost felt that using email in a writing program helps toward reaching writing standards and may even allow children to work at a more advanced level than they might do with pencils or markers. She states, "As the children begin to explore and see writing as a dynamic

communication tool, their electronic expressions become rich, rewarding experiences for all involved" (Yost, 2000, p. 28).

Karchmer (2001) conducted a study of teachers in grades K-12. The purpose of the study was to explore the reports of exemplary teachers on how the Internet influenced literacy and literacy instruction in the classroom. This researcher chose to examine the perspectives of teachers who were considered by others in education as exemplary when using the Internet in their classrooms because exemplars tend to possess characteristics that set them apart from their colleagues. The information provided by these teachers can be used to inform others in the field of education about if and how technology can have an affect on literacy and literacy education.

Thirteen teachers participated in this study. The teachers reported that certain aspects of literacy and literacy instruction in their classrooms were influenced by the use of the Internet with their students. The subject and grade level the teachers taught seemed to be a factor. Teachers at the elementary level focused on the appropriateness of the reading materials on the Internet, accurately evaluating information, and publishing student work. Teachers in grades 7-12 were more focused on the appropriateness of materials, precautions to ensure safe Internet use, and skills needed to evaluate information found.

Results of this study showed that these teachers talked about literacy in the classroom in terms of reading and writing. They reported that the skills necessary for effectively using electronic textual aids and evaluating materials found online were extensions of what was already being taught to students using print-based materials. While the elementary teachers acknowledged the interactive nature of the electronic textual aids, they reported that teaching students to use them was neither easier nor more difficult than when they used print-based text. All the teachers reported the importance of teaching students how to evaluate the accuracy of the

material found on the Internet. The teachers needed to teach this evaluation skill in greater depth and at an earlier age because evaluating Internet materials was more prevalent since the Internet was used more frequently in the classroom. The elementary teachers and one social studies teacher recognized differences in student writing when it was composed and published as electronic text. Students were more likely to revise work when it was composed on the computer and published online. Several teachers felt that the flexibility of electronic text made non-artistic students more likely to include illustrations. There seemed to be a change in student motivation to write when they published work on the Internet. These teachers' views on the influence of the Internet on literacy and literacy instruction provided insights to their beliefs for how the Internet, literacy, and literacy instruction are converging.

Karchmer concluded that the teachers seemed "to know what they need to teach (e.g. textual aids, evaluation of Internet text), but it may be helpful to further explore how best to teach these skills in light of new technologies" (2001, p. 464).

In 2002, Labbo, Eakle, & Montero used a case study approach to explore the potential for the digital language experience approach in a Kindergarten classroom. These researchers wanted to investigate the opportunities for literacy development available when digital cameras and creativity software were used during digital language experience activity (D-LEA) opportunities provided for young children in an early childhood classroom.

Three children, recommended by the teacher, participated in this study. Each researcher worked one-on-one with one of the children. The first child was India, a child who was identified through assessment data in her classroom portfolio as having low literacy abilities. She had some letter recognition, some sound/symbol understanding, poor concept of story structure, and a tendency to withdraw when work was difficult. The second child was Savannah, a child who

could be identified as having middle literacy abilities and her emerging literacies could be considered typical for her age and background. She could use alphabetic knowledge she had acquired through earlier experiences with print at home and at school, was able to use the alphabet to represent initial and final consonant sounds when she was writing, could write short sentences using invented spelling, and was able to recognize some pre-primer words in text. The third child was Tien-Tien, a child who was described by the teacher as having high literacy abilities. She was able to read many words and used various reading strategies when trying to figure out new, unknown words.

The D-LEA experiences provided India with unique opportunities for literacy learning. She learned that literacy could be an authentic experience involving multiple sign systems. She also had the opportunity to envision herself as literate and capable of writing and reading. The D-LEA experiences allowed Savannah to learn and practice multimodal ways for expression. She had opportunities to use and practice her developing skills such as letter/sound knowledge, punctuation, and keyboarding as well as providing her with many opportunities to practice reading and sharing texts she had written with the teacher, the other children, and the researcher. The D-LEA experiences offered Tien-Tien with opportunities to use a digital camera and computer software in an authentic way. She was able to interact with text, pay attention to punctuation, read the sentences she wrote on her own or that she dictated to the researcher, and get feedback from her peers.

Data was collected over a period of 12 weeks. Data collected included digital photographs, open-ended interviews with the children, open-ended interviews with the teacher, reflective researcher notes, assessment documents received from the teacher, D-LEA stories that

were printed out, field notes, audiotapes of each session with a child, and pages of transcripts from audiotapes supplemented with field notes.

Results from these case studies suggest that one-on-one D-LEA experiences can provide children of varying literacy abilities with unique opportunities for developing their literacy abilities. They also show that through D-LEA experiences, adults play an important role as a facilitator providing effective activities, modeling how to use technology tools, getting children to use descriptive language, and working on the literacy strengths and weaknesses of the children within meaningful contexts.

Conclusion

> Kamil, Intrator, & Kim (2000) describe the research on technology and literacy as, …a tapestry under construction. The warp and woofs of the fabric have not yet entirely come together. Rather, we have bits and pieces of an overall design. It is important that the lacunae be filled in if we are ever to make substantial progress in the application of other technologies to literacy" (p. 783).

It used to be when computer technologies were used in the classroom, they were considered to be something added to the teacher's already full instructional day. Computers were used for skill-and-drill practice, publishing the final draft of work using word processing, or engaging in a game as enrichment or a reward (Labbo, 1999). "Learning is not faster or easier just by simply exchanging instructional media. Effectively using technology in education requires thought, experimentation, and a willingness to spend the time needed to develop and refine strategies until they are proven to be effective" (para. 4). The challenge facing educators by new technological tools is not technological; it is philosophical. Traditional learning tools

such as books, pens, and paper have to co-exist with the technological tools that are available today (Thornburg, 1999).

In this chapter, I reviewed the research literature on how computers have been used with literacy instruction, on teacher perceptions about using technology, and on new literacies being used by teachers and students in literacy classrooms. In the next chapter I discuss the methodology I used for my study.

CHAPTER 3

METHODOLOGY

The purpose of this study was to investigate teachers' perceptions and practices on using technology to facilitate literacy instruction in early childhood classrooms. To accomplish this purpose, I used multiple literacies and multiple realities as the framework for the study. Multiple literacies involve the use of conventional literacy abilities and then expand on those abilities to include being able to read multimodal information such as what appears on computer screens. Computer screens provide a rich and complex way to make meaning because of the multimodalities and multiple symbol systems come together with the more traditional print-based literacy through the incorporation of print, graphics, audio, animations, video, and hyperlinks. The multiple realities (Labbo & Reinking, 1999) examine the intersection of technology and literacy instruction when looking at what teachers are doing with multiple literacies in their classrooms. Multiple realities focuses on the potential of what technology might do, what kinds of activities technology might be applied to, and what implications technology may have on literacy instruction beyond the traditional, established goals. The multiple realities for integrating technology in literacy instruction are: (a) new digital technologies should be available for literacy instruction, (b) new digital technologies should be used to enhance the goals of conventional literacy instruction, (c) new technologies should be used to positively transform literacy instruction, (d) new technologies should be used to prepare students for the literacy of the future, and (e) new technologies should be used to empower

students (p. 481). These five realities represent a continuum from traditional, more passive use toward the goal to put technology into a more transformative role.

Study Design

This study used a qualitative case study design. Qualitative case studies are well established in the field of education as a way to illuminate educational practice. Bogdan & Biklen (1998) view the term *qualitative research* as an umbrella to refer to research strategies that share similar characteristics. Data collected is rich in describing people, places, and conversations. Research questions are formulated to examine topics "in all their complexity, in context" (p. 2). They identify five features of qualitative research: (a) naturalistic, (b) descriptive data, (c) concern with process, (d) inductive, and (e) meaning. Qualitative research is naturalistic because researchers spend time in a particular setting. The concern is the context of what is being studied and they feel it can be best be understood when it is observed where it occurs. Qualitative research is descriptive because the data collected is done as words or pictures rather than numbers. Researchers try to describe a particular situation or view in a narrative form. Qualitative research is concerned with the process instead of outcomes or end products. Researchers are interested in how meaning is constructed or negotiated. Qualitative research is inductive. Researchers try to construct a picture that takes shapes as data is collected and examined. Qualitative research is concerned with meaning. Researchers are interested in understanding the participant's perspectives. According to Bogdan and Biklen (1998) all qualitative studies may not show all these features equally. They state, "The question is not whether a particular piece of research is or is not absolutely qualitative; rather it is an issue of degree" (p. 4).

Case study design is chosen based on the type of research problem and the research questions being asked. According to Merriam (1998) a case study is “an intensive, holistic description and analysis of a single entity, phenomenon, or social unit” (p. 34) and suggests it is selected when researchers try to gain an in-depth understanding of the situation and meaning from the participants. Researchers are interested “in process rather than outcomes, in context rather than a specific variable, in discovery rather than confirmation” (p.19). When defining case study, Miles and Huberman (1994) describe the idea of a case as a phenomenon occurring in a bounded context that can be represented as a circle with a heart in the center. The focus of the study is represented by the heart and the circle defines the boundary or what will not be studied. For this study, each Kindergarten teacher’s perception and practice was the “heart” of the case in order to develop a better understanding of her use of technology during the literacy instruction in her early childhood classroom. Data was collected and analyzed from the three Kindergarten teachers to create an interpretive case study for each one. Interpretive case studies include thick, rich description and are “differentiated from straightforward descriptive studies by their complexity, depth, and theoretical orientation” (Merriam, 1998, p. 39).

Participant Selection

In qualitative research, sample selection is usually nonrandom, purposeful, and small. Purposeful sampling is based on the assumption that there is a desire to discover, understand, and gain insight and the researcher has to select a sample that will offer the best opportunity to gain it. The first step in beginning purposeful sampling is to determine selection criteria that are essential for deciding on who is to be studied, reflects the purpose of the study, and guides the identification of information-rich cases (Merriam, 1998). According to Patton (1990, p. 169)

"Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the research."

For this study, I used purposeful sampling. Participants were selected using an adaptation of maximum variation sampling. Since the focus of this study was on teachers' perceptions and practices on using technology to facilitate their literacy instruction, only teacher's known to use computer technology were sought. Selection was based on a predetermined set of criteria and the recommendation by the Literacy Coach as a key informant within the school who acted as an "expert" on the literacy instruction being followed by the Kindergarten teachers. The criterion for participation in this study were:

1. The teacher is teaching at the Kindergarten level.
2. The teacher incorporates computer technology during her literacy instruction block.
3. The teacher is recommended by the Literacy Coach for the Kindergarten through Second Grade level at the school.
4. The teacher indicates interest in participating in the study.

To identify prospective participants, I sought the help of the Literacy Coach for the Kindergarten through Second Grade level within the school. During a meeting with her, I explained the purpose of my study and the criterion for teacher participation. The Literacy Coach was asked to identify Kindergarten teachers who would match that criterion based on her work with the teachers and her knowledge of the teacher's use of computer technology along with the district's literacy curriculum. During a weekly grade-level meeting, the Literacy Coach introduced and went over what was involved in the study with the Kindergarten teachers. Then, during a meeting with the Literacy Coach about another study that was being conducted at the school, the she introduced me to the teachers who were interested in becoming part of my study.

I then talked with each interested teacher and answered any further questions she had about the study.

Participants

Merriam (1998) recommends that the number of participants for a study should be an adequate number to answer the questions posed in the purpose statement at the beginning of the study. "It always depends on the questions being asked, the data being gathered, the analysis in progress, the resources you have to support the study" (p. 64).

The primary participants in this study are three Kindergarten teachers within the school. The study was conducted within the classrooms of these teachers. Each teacher selected a pseudonym to be used in the writing of this dissertation. My first teacher participant is Erin. She is a new teacher. This is her second year of teaching. She has only taught at the Kindergarten level. My second teacher participant is Danielle. She is a veteran teacher. She has been teaching for fifteen years. She has taught at the Kindergarten level for three years. She also has experience teaching at the First, Second, Third, and Fourth grade levels. My third teacher participant is Antoinette. She is also a new teacher. This is her second year of teaching. She has only taught at the Kindergarten level.

Because of teacher comments during the semi-structured interviews and during informal conversations, after the study started I applied to the Institutional Review Board (IRB) to add three additional participants to the study to be able to interview them about the use of technology during literacy instruction in these Kindergarten classrooms. After receiving IRB approval three additional participants were added to the study, (a) the Principal, (b) the K-2 Literacy Coach, and (c) the Media Specialist.

Informed Consent

After talking with each Kindergarten teacher who indicated that she was interested in being a participant in my study, I gave each teacher two copies of the teacher consent form. One copy of the signed teacher consent form was returned to me to keep filed with study materials. The teacher kept the second signed copy of the consent form. The teachers were free to ask any questions they might have about the study, the data collection, or any concerns they may have. Appendix H includes the teacher consent form.

Parent consent forms were sent home to get permission to allow me to have each teacher collect examples of student work. Each teacher sent home two copies of the parent consent forms in each child's work folder. The parent consent form was translated into Spanish by the school's Hispanic liaison, a native Spanish speaker, for those parents who do not read English. The parents were asked to sign both copies. They returned one signed copy to their child's classroom teacher and kept one signed copy. The teachers collected the signed parent consent forms and gave them to me when all the signed forms had been collected or when they felt that no more signed forms would be coming back. Appendix I includes the parent consent form in English and Spanish.

After receiving IRB approval to add three participants to the study, three consent forms specific to each of these people were written. The Principal, the K-2 Literacy Coach, and the Media Specialist were each given two copies of their consent forms when I met with them to talk about my study, explain why I wanted to include them in the study, and to schedule their individual semi-structured interview by the end of the data collection. I asked each of them to sign both copies of their consent form. They returned one signed copy of their consent form to

me when I arrived to do their scheduled interview. They kept one signed copy of the consent form. Appendix J includes an example of the Literacy Coach consent form.

Study Setting

This study was conducted at Fairdale Elementary (a pseudonym). Fairdale is a minority school and is traditionally the highest poverty school in the school system. There are 511 children attending this Pre-Kindergarten through Fifth grade school. Many of the children come from single parent homes. Ninety-six percent of the children are on free or reduced lunch. The school population is 30% Hispanic, 65% African American, and 5% Caucasian. Classrooms at the Kindergarten through Second Grade levels have reduced class size. No teacher at these grade levels has more than 15 children in their class.

Data Collection

Selecting the techniques of data collection effects what constitutes the data fitting the purpose of the research (Merriam, 1998). In qualitative research there are three common, primary sources and means of collecting data: (a) interviews, (b) observations, and (c) documents (Merriam, 1998; Patton, 2002). The data collection techniques used and the information that is considered data in a study are determined by the theoretical orientation of the researcher, the problem of the study, the purpose of the study, and the sample that was selected (Merriam, 1998). Patton (1990) contends that multiple sources of information are sought and used in order to validate and cross check findings and that no single information source can be used to provide a comprehensive perspective. For this study, I used the following techniques for data collection: (a) questionnaires, (b) classroom observations, and (c) individual interviews.

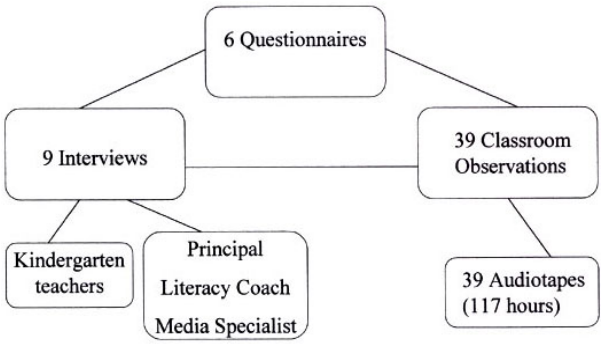

Figure 3.1. Data sources chart.

Questionnaires

I began collecting data by asking the three Kindergarten teachers to complete a questionnaire. According to Merriam (1998), the term *documents* is an umbrella term that refers to a range of written, visual, and physical materials that are relevant to the study. Researcher-generated documents are prepared by the researcher or by the participants for the researcher. A researcher generates documents to learn more about the situation, the person, or the particular phenomenon that is being studied. I developed the questionnaires as documents to be completed in writing by the teachers.

The first questionnaire consisted of eleven items. Appendix K includes the first questionnaire. The items included in this questionnaire aligned with the guidelines of Converse and Presser (1986). Items on the questionnaire asked each teacher to give information on her teaching background, describe her teaching style, give her definition of literacy, explain her philosophy of teaching literacy, and explain her philosophy on using technology. This questionnaire also asked each teacher to do self-ratings on four aspects of her computer technology use. Each teacher was asked to mark the scale anywhere along the scale line to describe her ability to use computer technology. After marking each of these rating scales, the teacher was asked why she rated herself at that point.

The first scale asked each teacher to rate herself as a computer user (see Figure 3.2).

Figure 3.2. General use of computer technology scale.

The second scale asked each teacher to rate her use of computer technology in her teaching in general (see Figure 3.3).

Figure 3.3. Use of computer technology in teaching in general.

The third scale asked each teacher to rate her use of computer technology during her literacy instruction (see Figure 3.4).

Figure 3.4. Use of computer technology in literacy instruction scale.

On the fourth scale, each teacher rated the frequency of her computer technology use during literacy instruction (see Figure 3.5).

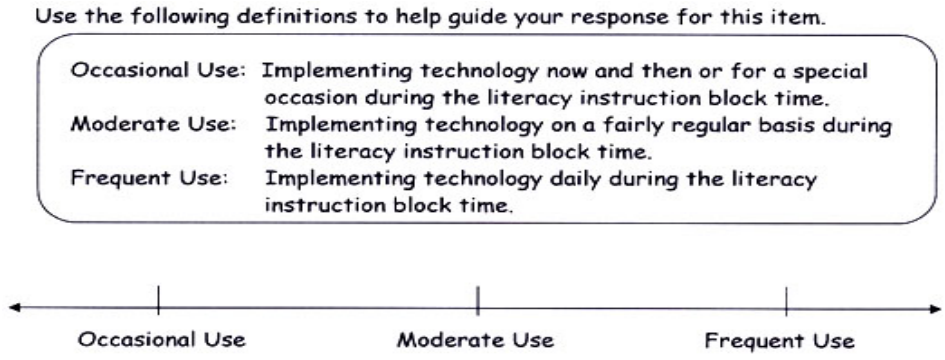

Figure 3.5. Frequency of computer technology during literacy instruction.

At the end of the first week of classroom observations, each teacher was given a second questionnaire consisting of nine items. Appendix L includes the second questionnaire. Each teacher was asked to complete this questionnaire within two weeks. Items on this questionnaire asked each teacher for information about what types of technology she uses, how she uses computer technology with the children, how prepared she feels about using computers during her literacy instruction, professional development training she has participated in, using the National Educational Technology Standards for Teachers, her perception on how technology has helped her in her literacy teaching, barriers she sees to using computer technology in her literacy instruction, and what she would like to do in the future with her children involving computer technology during literacy instruction.

Observations

Classroom observations were scheduled to take place in a 3-week rotation. For the first observation rotation, I observed for five days during the week in each classroom. During the second rotation, I observed for four days during the week. For the third rotation, I observed for four days during the week. Over the course of the observation rotations, five observations had to be rescheduled due to previously scheduled school activities, teacher absence, and researcher illness. These rescheduled classroom observations were done after the end of the observations in the last classroom of the final rotation of the original schedule. A total of thirty-nine observations were completed. Thirteen observations were made in each Kindergarten classroom. I observed in each classroom every third week. Each teacher wore a small microphone so that I was able to audiotape each observation visit. These audiotapes were transcribed and used to go along with my field notes.

Before I started doing the classroom observations, I visited each teacher to be sure the teachers had the observations on their calendars. I started my observations in Erin's classroom. The second classroom I observed was Danielle's room. The third classroom observed was Antoinette's classroom. Each of the observation visits occurred during the literacy instruction block. The literacy block is three hours long and is made up of the Morning Meeting, Reader's Workshop, Writer's Workshop, and the Second Daily Dose of Reading Skills Block. It is scheduled from the beginning of the school day until recess and then continues after recess until the class goes to the grade level special classes for Art, Music, Physical Education, and Library. All of these Kindergarten teachers follow the same daily schedule for their literacy block:

8:00-8:30am	Morning Meeting
8:30-9:30am	Reader's Workshop
9:30-10:30am	Writer's Workshop
10:30-11:00am	Recess
11:00-11:30am	Second Daily Dose of Reading Skills Block

In qualitative research, observation is a major means for collecting data. Observations take place within the study setting. Observational data consists of firsthand experiences of the researcher with what is being studied. Observation is used as a research tool when it serves a formulated purpose, is deliberately planned, is systematically recorded, and is subjected to checks and controls on validity and reliability (Merriam, 1998).

An observer records what is happening as it is happening and is able to use his or her knowledge to interpret what is being observed and needs to be recorded in as much detail as possible in order to form the database for analysis. Field notes from the observations include

descriptions, direct quotations, and observer comments. Observations can be used to provide reference points that can be used during interviewing (Merriam, 1998).

In my study, I saw my role as observer as "one who participates in a social situation but is personally only partially involved, so that he can function as a researcher" (Merriam, 1998, p. 102). Because the settings for the observations were early childhood classrooms, unexpected or unfamiliar people entering the classroom can be disruptive. Before going into the room to make the first observation, each teacher explained to the children that I would be coming to observe what was going on in the classroom and not to work and interact with the children. The children were told to pretend that I was not there and not to come up and talk with me.

According to Patton (2002), the researcher must be flexible, sensitive, and adaptive regarding the degree of participation that is appropriate in any observational study. He contends the challenge is to combine participation and observation to become capable of understanding the setting as an insider while at the same time being able to describe it to outsiders. He states, "The ideal in evaluation is to design and negotiate that degree of participation that will yield the most meaningful data" (p. 267).

For each observation, I used the same location where I set up my computer in each classroom where I could clearly observe what was happening during the literacy instruction in order to minimize interference with the instructional time or becoming a distraction for the children while taking field notes. According to Merriam (1998), what is written down or recorded during an observation becomes raw data. The findings of a study emerge from the raw data. "The more complete the recording, the easier it is to analyze the data" (p. 104).

Interviews

During the second week of observations in each classroom, I scheduled the first individual in-depth interview with each teacher. An interview guide was created for this semi-structured interview. Appendix M includes the interview guide used for the first interview. Having an interview guide allowed for questioning uniformity but also left open the possibility to probe further for some questions. The interview for each teacher was audiotaped. Then I transcribed each of the interview tapes. Some of the questions were based upon information supplied by each teacher on the questionnaire and allowed her expand further on her responses.

During the final week of classroom observations a second semi-structured interview was scheduled. A second interview guide was created for this interview. Appendix N shows the interview guide for the second interview. This interview was audiotaped and then I transcribed the tapes. The purpose of the second interview was as a follow-up to information that was included in my classroom observation field notes, both questionnaires, and the first interview.

After receiving IRB approval to add three additional people as participants, I scheduled an individual semi-structured interview with the Principal, the K-2 Literacy Coach, and the Media Specialist. The purpose of these additional interviews was to follow up on comments provided by the Kindergarten teachers during their interviews. Each of these interviews was audiotaped and then transcribed.

Interviewing is a common method for collecting qualitative data. The most common for of interview is conducted person-to-person during which one person elicits information from the other person. Interviewing is used when we cannot observe behavior, feelings, intentions, a person's interpretation of the world around them, or a past event that is impossible to replicate (Patton, 1990, Merriam, 1998). The main purpose of an interview is to be able to get a special

kind of information (Patton, 1990). He states, “We interview people to find out from them those things we cannot directly observe… We have to ask people questions about those things. The purpose of interviewing, then, is to allow us to enter into the other person’s perspective” (p. 196). Deciding to use interviews as a primary way to collect data should be based on the kind of information that is needed. Interviewing is the best technique to use for intensive case studies of a few selected individuals (Merriam, 1998). Qualitative interviewing is used to “capture how those being interviewed view their world, to learn their terminology and judgments, and to capture the complexities of their individual perceptions and experiences” (Patton, 2002, p. 348).

There are three types of interviews. The first type is the highly structured interview that consists of questions that are asked in a specific order that is determined ahead of time. This type of interview is used primarily to gather socio-demographic data from participants. The second type of interview is the semi-structured interview. In this type of interview, questions are worded more flexibly or there is a mix of more and less structured questions. Semi-structured interviews allow a researcher to be responsive to what is happening in the situation, to the participant’s view that emerges within an answer, or to new ideas about a topic that are given by a participant about a topic. The third type of interview is the unstructured, informal interview. In this type of interview, there is no specific, predetermined set of questions. The interview is used to learn enough about a phenomenon to be able to ask relevant questions (Merriam, 1998).

Data Analysis Process

Data analysis is a process for systematically searching for and arranging data from the data collected to help increase the researcher’s understanding of them and present what has been discovered to others (Bogdan & Biklen, 1998). The process of data collection and data analysis is a dynamic, recursive process (Merriam, 1998). The process is highly intuitive and according to

Merriam (1998, p. 156), “a researcher cannot always explain where an insight (that may later be a finding) came from or how relationships among data were detected.”

For this study, I used the constant comparative method for the analysis. The constant comparative method developed by Glaser and Strauss (1967) was developed as a means of developing grounded theory consisting of categories, properties, and hypotheses that act as conceptual links among the categories and properties. This process is a continuously growing process where each stage provides continuous development to its successive stage until the analysis ends. However, according to Merriam (1998), the basic strategy of the constant comparative method is compatible with inductive concept building, applies to all types of qualitative research, and has been adopted by researchers who do not want to build a substantive theory

In analyzing case studies some features of the case studies affect the data analysis. A paramount consideration in analyzing the data in case studies is conveying an understanding of the case (Merriam, 1998). This study employed a qualitative case study design involving multiple case studies of Kindergarten teachers. Multiple case studies involve collecting and analyzing the data about several cases. Miles and Huberman (1994) state, “By looking at a range of similar and contrasting cases, we can understand a single-case finding, grounding it by specifying how and where and, if possible, why it carries on as it does. We can strengthen the precision, the validity, and the stability of the findings” (p. 40). According to Merriam (1998), the more cases included in a study, the greater will be the variation across the cases, and the more compelling the interpretation could be. Including multiple cases is a common strategy used to increase external validity and generalizability of study findings. The analysis involved with

multiple case studies includes two parts: a within-case analysis for each case and a cross-case analysis of all the cases (Merriam, 1998).

Within-case Analysis

I started my within-case analysis with Antoinette's data. During the within-case analysis each case was treated as a comprehensive case. Each case was analyzed to look for categories and themes based on the data collected (Merriam, 1998).

All the questionnaires, classroom observation field notes, and interview transcripts for Antoinette were coded using open coding to identify categories. When developing a coding system, the researcher searches through the collected data looking for regularities and patterns as well as topics and patterns. Then the researcher writes down words and phrases to represent these topics and patterns. These words and phrases become the coding categories and act as a means of sorting the data collected. Developing a list of coding categories is a crucial step in the analysis (Bogdan & Biklen, 1998).

I began by reading through the classroom observation notes. As I read the first observation, I used colored markers to highlight words and phrases, jotted down my thoughts, made researcher notes, and began developing a master list of coding categories. "The process is one of breaking data down into bits of information and then assigning these bits to categories or classes which bring these bits together again if in a novel way. . . In the process we begin to discriminate more clearly between the criteria for allocating data to one category or another" (Merriam, 1998, p. 180). Making these comparisons leads to categories that are compared to each other and other incidents. Units of data are sorted into groupings that have something in common. A unit of data is a meaningful segment of data. A unit of data must meet two criteria. First, the unit should be heuristic in order to reveal information relevant to the study and help the

reader think beyond that bit of information. Second, the unit of data should be the smallest bit of information that can stand by itself. The researcher tries to compare one unit of data with the next looking for recurring ideas in the data (Merriam, 1988).

I continued reading through each day's classroom observation notes highlighting words and phrases that fit the coding categories already established and looking for new categories. This process follows the first stage of the constant comparative method "comparing incidents applicable to each category" (Glaser & Strauss, 1967, p. 105) which involves the researcher in coding each incident in the data into as many categories as possible as new categories are identified or as the data fits into an existing category. When a new category was identified, it was added to the master list. After finishing the coding of a day's observation, if a new category had been identified, I went back to previously coded observations to see if there was data that fit into the newly added category. A defining rule in the constant comparative method is that "while coding an incident for a category, compare it with the previous incidents in the same and different groups coded in the same category" (Glaser and Strauss, 1967, p. 106).

Following the coding of the classroom observations, I began work on the questionnaires. I read through the response to each questionnaire item and coded the responses to see if the coded data fit in the established categories. If a new category was identified in the questionnaire responses, I then went back to the classroom observation's to see if there were incidents that fit the new category.

Finally, I worked on the interview transcripts. I read through the response for each interview question and coded the information to see if it fit into the categories on the master list. Again, if a new category was identified in the interview responses, I went back to the previously

coded questionnaires and classroom observations to see if there were instances that fit this new category.

When the coding of all the collected data was completed, I had a master list of nineteen categories: (a) skills, (b) goals for children, (c) fun/ affective/hands-on/enhancing, (d) authentic purposes, (e) teacher use of new literacies, (f) technology used in traditional ways, (g) new literacies skills – children, (h) traditional resources used for teaching, (i) technology used as teacher resource, (j) barriers to technology use, (k) role of technology, (l) training, (m) support for technology use, (n) cognitive effects of technology use, (o) classroom organization, (p) connection to standards, (q) frequency of use, (r) accountability, and (s) parental involvement.

My next step was to create a chart for each category on the master list. Included within each chart were four columns of information with the headings: (a) Source, (b) Teacher, (c) Line Number, and (d) Example Text. Appendix O includes a blank coding category chart that was used. I went back through each coded observation, questionnaire, and interview transcript and entered examples of text that fit into each category. Appendix P includes completed coding category chart.

After completing the first set of charts for each of the categories, I created a second set of charts with additional columns. The column headings added were: (a) Episode, (b) Instructional Focus, (c) Technology Used As, (d) Behavior of the Children, (e) Active/Passive Involvement, and (f) Independent Assignment Completion. Appendix Q includes a blank chart for the second set of charts. I went back through each coded data document again and filled in the information in the added columns. The final column on the chart, Independent Assignment Completion involved the children's being able to use what was taught using technology during a lesson

within their assigned independent work. To complete the work on each chart I marked and numbered the learning episodes within each data source. Appendix R includes a completed coding chart from the second set.

As a final step of the within-case analysis, I looked at the Behavior, the Active/Passive, and the Independent Assignment Completion columns to determine if there was an alignment or misalignment between these three columns and to show gaps between the teacher's perception and her practice.

I followed the same procedure to work on the within-case analysis for the other two Kindergarten teachers. As I worked through each teacher's data, if a new category was identified, I went back to the other teacher's data to see if any incidents in their data fit into the newly identified category.

Cross-case Analysis

Cross-case analysis begins when the analyses of the individual cases are completed. During the cross-case analysis I began looking for what was similar among the cases. Then going through the data again, I looked across the cases to distinguish differences. Within the differences, I also looked for anything that stood out as something unique to a particular case. "Ultimately, cross-case analysis differs little from analysis of data in a single qualitative case study" (p. 195). During cross-case analysis, the researcher tries to develop an explanation that fits across the individual cases. This level of analysis can lead to identifying themes that conceptualize the data from all the cases (Merriam, 1998).

To display my data from the cross-case analysis I created a cross-case comparison chart. This chart includes four headings: (a) Technology used, (b) Facilitating literacy instruction, (c) Modes of meaning making, and (d) New literacies – Interactive.

Categories are listed under each heading. Categories under the Technology used heading include (a) smart board, (b) laptop, (c) websites, and (d) software. Categories under the Facilitating literacy instruction heading include (a) daily routines, (b) transitions, (c) writer's workshop, (d) reader's workshop, and (e) reader's theatre. Categories under the Modes of meaning making heading include (a) print, (b) animation, (c) audio/music, (d) graphics, (e) gestural, (f) spatial, (g) linguistic, and (h) multimodal. Categories under the new literacies used heading include (a) click, (b) drag, (c) touch screen links, (d) navigating on screen, and (e) screen writing with an electronic pen. I arranged the chart by teacher name. Under each teacher's name I identified the approach she uses for her teaching. For this chart, I used the following scale:

✓- = 0-1 time ✓ = 2-3 times ✓+ = 4 or more times

Appendix S includes a blank chart that was used for this cross-case comparison.

All of these Kindergarten teachers feel that using technology during instruction is motivating for the children's learning. For my next cross-case comparison, I created a chart to display findings about the percentage of children's engagement with technology and their ability to complete assignments independently. The categories for this chart include (a) active engagement, (b) passive engagement, (c) off-task behavior, (d) on-task behavior, and (e) assignment completion. From the within-case analysis data about each teacher's use of technology, I calculated the percentage of the children's engagement within each of these categories. Appendix T includes a blank chart that was used for the children's engagement.

For a final cross-case comparison, to display the data about the gaps (misalignments) identified between the teachers' perceptions and practice on using technology during each within-case analysis, I created a Gaps chart arranged by teacher name. Under each teacher's name I identified the approach she uses for her teaching. On the chart if the identified gap was

found for a teacher, I put a check mark in the box under that teacher's name. This allowed me to see which gaps the teachers had in common and if there were any gaps that were unique to a specific teacher. Appendix U shows a blank Gaps chart that was used for this cross-case comparison.

CHAPTER 4

FINDINGS

In Chapter 3, I explained the methodology I used for my study. I described the design of the study, how participants were selected, who the participants were, how informed consent was obtained, the setting for the study, my data sources and how data was collected, and the method of data analysis that was used. In this chapter, I report on the findings of the within-case analysis for each teacher. I also report on the cross-case analysis.

I start this chapter with a report of my within-case analysis for each teacher. The information is presented in three sections. In the first section I give a description of the teacher. In the second section, I talk about my research questions for the teacher as it addresses her perceptions and practices on using technology in her literacy instruction. In the third section, I give a summary of the within-case findings for the teacher.

Within-case Findings: Erin

Who Is Erin?

Erin is a new teacher. She has been teaching for two years. She has only taught at the Kindergarten level. She moved to Georgia after completing her education degree. She is in her early twenties and single.

Erin describes her teaching style as being very student focused. She wants the children in her class to learn from each other. She encourages the children to talk, touch, play, explore, sing, and be very actively involved in learning. She enjoys involving songs, dancing, and chants into the activities she does with her children. To encourage children staying on task during learning,

she incorporates positive reinforcement and rewards into her classroom management. For example, children earn stars for being good listeners, cooperating and working well with other children, following directions, and staying on task during independent work times. When the children earn five stars, they earn a piece of candy. When the children earn twenty-five stars, they have the opportunity to choose an item from the prize box. She feels her teaching is fun, exciting, rewarding, and memorable.

Erin defines literacy as developing skills in reading and writing to become a better reader or writer. Her literacy instruction involves learning and working on skills such as letter/sound correspondences, phonics, and sight word recognition. During her literacy instruction she employs reading aloud, shared reading, think-alouds, working with words on the word walls, and shared writing. Her daily literacy lessons are divided into four parts: (a) a mini-lesson when the teacher teaches, (b) work time when the children try to work on their own, (c) guided instruction when the teacher works with the children, and (d) share time when children share what they have been working on with the rest of the class.

Erin's philosophy on teaching literacy is that children need to be involved in their learning. She wants her children to know that it is okay for them to make mistakes because they can learn how to fix their errors. She feels the teacher's role is to facilitate learning and then assess what the children have learned participating in learning activities. However, she feels there is also a time and place for direct instruction.

Self-rating of Computer Technology Use

On the first questionnaire, Erin rated herself on her use of computers in several aspects: (a) her general use of computer technology, (b) her use of computer technology in her teaching

in general, (c) her use of computer technology in her literacy instruction, and (d) the frequency of her computer technology use during literacy instruction.

General Use of Computer

She rated herself on her general use of computer technology as being better than average but not quite at the advanced level as a computer user. She believes that there are many things she can do well on the computer but there is so much more she doesn't know. She feels she is good at using email, using Facebook and MySpace on the Internet, downloading pictures from her digital camera, and using Internet websites on the smart board. She feels she is not good at using PowerPoint, spreadsheets, and word processing (see Figure 4.1).

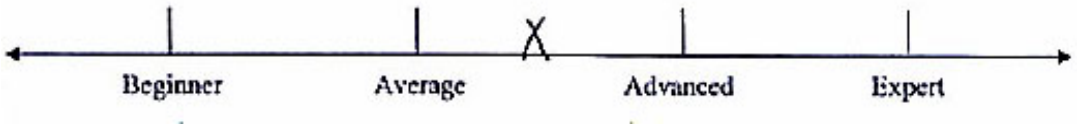

Figure 4.1. Erin's general use of computer technology scale.

Computer Use in Teaching in General

Erin rates her use of computer technology in her teaching in general as far beyond the beginner level and has almost reached the average level. She likes using the smart board but feels limited to what she can do on it. Because she feels limited, she feels she often does not use a lot of technology (see Figure 4.2).

Figure 4.2. Erin's use of computer technology in teaching in general scale.

Computer Use in Literacy Instruction

For her use of computer technology during her literacy instruction, she rates herself as above the average level but is still quite a ways from the advanced level of use. She uses technology in her literacy instruction to teach letter sounds, blends, and matching voice and print while reading (see Figure 4.3).

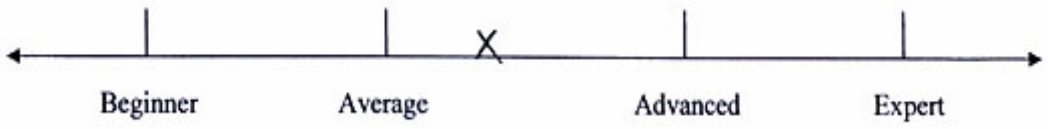

Figure 4.3. Erin's use of computer technology in literacy instruction scale.

Frequency of Computer Use during Literacy Instruction

Frequency of computer use was defined in the questionnaire at three levels: (a) Occasional Use, (b) Moderate Use, and (c) Frequent Use. These levels of use were given as guidelines for the teachers to use as they rated their frequency of use. Erin rates the frequency of her computer use during literacy instruction as Moderate. She commented that she uses it mainly during skills block (see Figure 4.4).

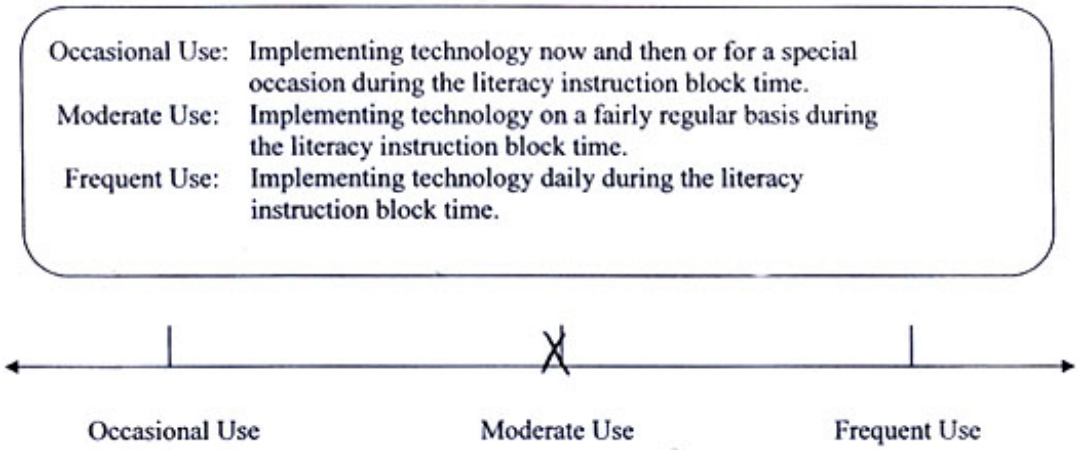

Figure 4.4. Erin's frequency of computer technology use during literacy instruction.

Research Questions

In this section I look my research questions about Erin. I begin by looking at the first question: What perceptions do teachers have about using technology during literacy instruction in early childhood classrooms? I conclude by looking at the remaining three questions: (a) What technology are teachers using to facilitate literacy instruction in early childhood classrooms? (b) What modes of meaning making are being supported through the use of technology during literacy instruction? and (c) What new literacies are being used during literacy instruction? as I describe Erin's use of computer technology for the literacy instruction block during the classroom observation visits.

Perceptions About Using Technology

Erin believes that technology is very important in the classroom. She feels that as technology advances children need to become proficient in their computer skills because they will be using it the rest of their life. Children need to learn and know the language of technology. Children also need to know how to use different types of technology such as computers, CD players, digital cameras, and be able to use and interact with the smart board.

Erin views technology as an extra resource for teachers to use. It's another way for teachers to teach what they are already teaching and should be used as much as possible because it is very beneficial. And, it gives the children another way to learn something.

Erin believes that using technology has helped her teaching a lot because the children are much more engaged and they get excited when they use it. She believes the children seem to learn skills better and faster when they are involved in using technology. She would like to have more activities to do to scaffold the children's learning. However, she feels she does not have the

time to learn and prepare lessons involving technology. If she did, she would have a lot of it in her lesson plans and would be more consistent about using it instead of being sporadic.

Technology Used, Modes of Meaning Making, and New Literacies

The literacy block in these Kindergarten classrooms is divided into four learning episodes: (a) Morning Meeting, (b) Reader's Workshop, (c) Writer's Workshop, and (d) Second Daily Dose of Reading Skills Block. The teachers follow an English Language Arts Framework of performance standards for reading and writing when they are planning their literacy instruction. The reading performance standards are divided into six areas: (a) Concepts of Print, (b) Phonics, (c) Phonological Awareness, (d) Vocabulary, (e) Fluency, and (f) Comprehension. There is one performance standard for Writing. Within each performance standard are elements the teachers incorporate into their literacy lessons. Appendix V includes the English Language Arts Framework for Kindergarten in Reading and Writing.

The main type of computer technology Erin uses to facilitate her literacy instruction is an interactive smart board connected to a teacher laptop computer that has wireless Internet access. Erin was observed using the smart board to engage the children in activities during the Morning Meeting, Reader's Workshop, Writer's Workshop and the Second Daily Dose of Reading Skills Block learning episodes at various times. She also used the smart board as a classroom management technique during transition times when the class finished work early and there were a few minutes before going to one of their scheduled special classes: Art, Music, Library, or Physical Education.

Morning meeting.

Each morning, Erin began the school day by having the children gather on the mat in front of the smart board for the daily morning meeting. She began each day by bringing up a play

list of songs on the smart board. She would decide on a song for the children to sing, click on a title in the list, and the song would play. The children sang along with the music. Most days she started with the song, *Hello Neighbor*. Then she would choose one or two other songs to sing with the children. This was her only use of the smart board during the Morning Meeting. She did not use it for any of the other daily routines that were done during the meeting.

The children did not interact with the smart board during the Morning Meeting. The smart board was used in a traditional way as a CD player.

This activity involved the children with the audio/music mode of meaning making. They heard the music and practiced the words as they sang along with the song as it played.

Reader's workshop.

During a Reader's Workshop lesson, Erin used the story *Bella Lost Her Moo*. After reading the story aloud, she asked the children to name the animals in the text. They named the animals in random order. When all the animals had been named, she told the children to think about what sound each of the animals makes. She named an animal and the children made the sound for that animal. To begin the smart board activity, Erin displayed a picture of a barn, pictures of the animals in the story, and the animal sound words. She had one child come to the screen, click on the picture of the cow, and drag it to the left side of the screen under the barn. This picture was Bella, the cow. She told the children to think about the order Bella met the animals in the story. She asked which animal Bella met first. She called on a child to come and click on that animal and drag it next to the cow's picture. Then she asked which animal Bella met second. She had a child click and drag that animal's picture next to the other two animal pictures to form a line. She asked which animal Bella met third. She had another child click and drag the third animal picture next to the other pictures in the line. She continued having the

children click and drag the rest of the animal pictures into the line. When the line of animal pictures was complete she had the children name the animals in the order they appeared in the story. Next she read the animal sound words on the screen with the children. She asked what sound the cow makes. She had a child point to the animal sound word on the screen, click on it, and drag it under the picture of the cow. She moved to the next animal picture in the line and asked what sound this animal made. A child found, clicked, and dragged the animal sound word under the animal's picture. She continued having the children name the animal pictures in the line and then having individual children find, click, and drag the animal sound word under each corresponding animals picture.

To end the lesson, she reviewed the steps the children had followed during the activity on the smart board. She told them they would be doing a worksheet about Bella just like they had done on the smart board. The children went to their tables to work on their assignment independently. She gave each child a picture of the barn and a page with the animal pictures and animal sound words. She told them to begin by coloring the barn picture, then cut out the animal pictures and glue them under the barn in the order Bella met the animals in the story. Next they cut out the animal sound words and glued them under the animal that made that sound (see Figure 4.5).

This activity worked on skills in three areas of the Reading framework. It worked on Concepts of Print by having the children listen to the story and look at the illustrations for enjoyment and reinforcing the idea of tracking from left to right when they put the animal pictures and animal sound words in a line under the barn. It worked on Comprehension by having the children listen to the story to gain knowledge about the order Bella met the animals and retelling the story by putting the animals Bella met in the order she met them. And it worked

on Vocabulary by talking about the animal sounds words and matching these sound words to the animal that makes the sound. This activity introduced new words for the all the children's listening and reading vocabularies, but it was especially beneficial for the Hispanic children. There are several children in Erin's class who came to school not speaking English and working with the words in this lesson helps them to increase their English vocabulary.

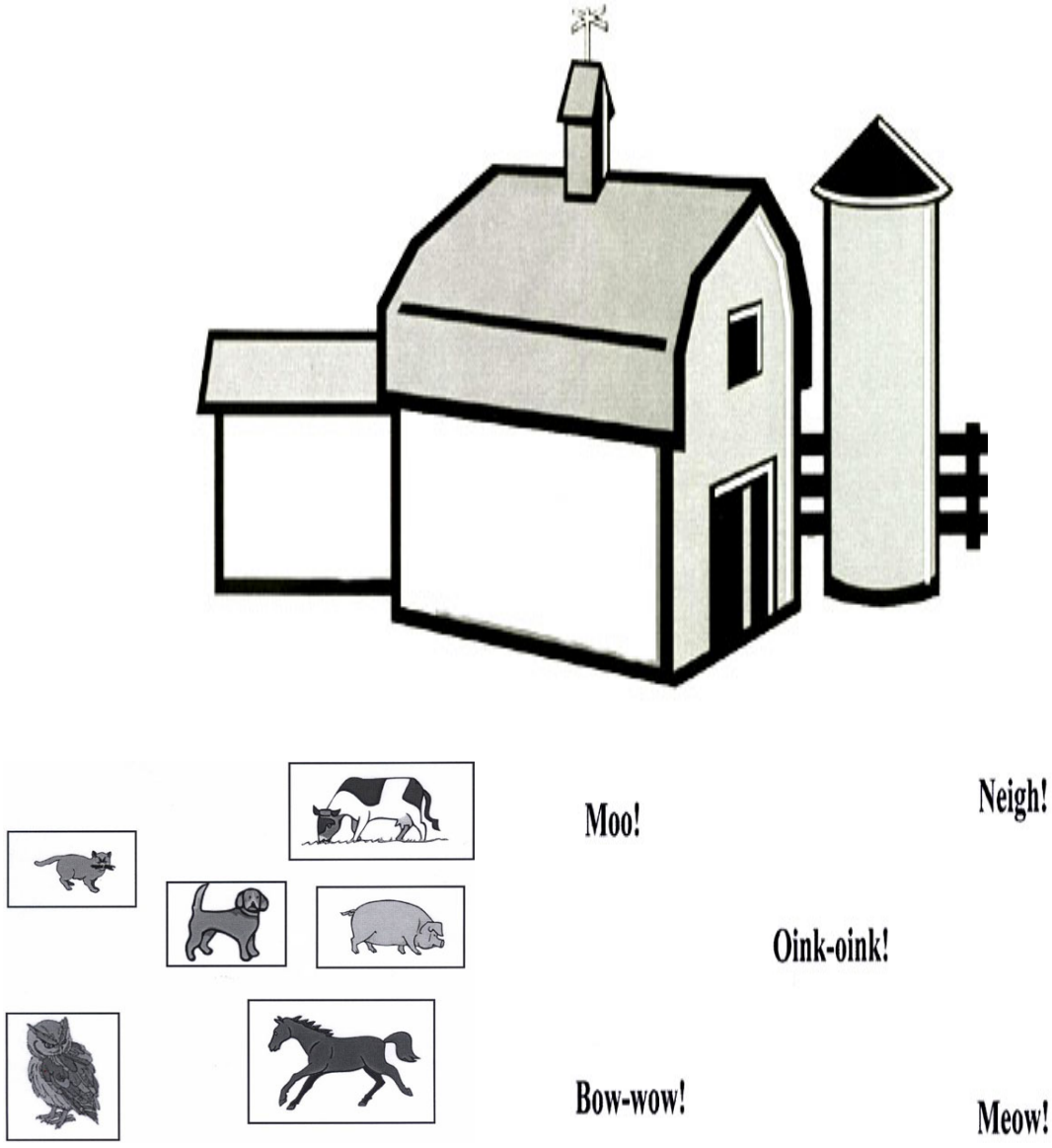

Figure 4.5. *Bella Lost Her Moo* activity.

Erin involved the children in several modes of meaning making within this activity on the smart board. She used the graphics mode by using pictures of a barn and the farm animals. She incorporated the print mode by having the typed animal sound words appear on the screen. She used the spatial mode by having the children click and drag the animal pictures into a line from the left to the right on the screen according to the order Bella met them. She used the spatial mode when the children moved pictures on the screen to a designated space.

Erin incorporated several new literacies during this activity while the children interacted with the smart board: clicking, dragging, and navigating on the screen. First she asked the children to identify an animal and click on the selected picture to activate it on the screen. Then she had them drag the activated animal picture into the correct position in the line. To accomplish this lesson activity the children were required to navigate the picture on the screen from the place it initially appeared to where it belonged in the line of animals under the barn.

Writer's workshop.

An example of an activity during Writer's Workshop in which Erin used the smart board involved the children in making a *Look At Me* book. At the beginning of the day Erin spontaneously decided to take pictures of the children doing different actions and activities. She downloaded the pictures from the digital camera to her laptop. At the beginning of the lesson she explained to the children that they would be writing a book about themselves. She brought up a child's picture on the smart board to explain how they would create their page for the class book. There would be a picture of one of the children and they would write two sentences on their page. The first sentence would be, *Look at me.* The second sentence would begin with the words *I am.…* and they would finish the sentence by telling what they are doing in the picture. She told them they would be taking turns writing their sentences on the smart board. When their picture

was displayed on the screen, it would be their turn to use one of the electronic pens to write their two sentences.

While the children waited for their turn to write their sentences on the smart board, Erin divided them into groups to work on activities in three centers. In the first center the children worked on a counting activity using teddy bear counters. In the second center the children worked on matching plastic letters to the beginning sounds for pictures on a lotto card. In the third center, the children read stories using an electronic Leap Pad system. She rotated the groups to a different center every twenty minutes. Erin saved each child's page when they finished writing their sentences. Later in the day she printed out the pages and bound them into the *Look At Me* book. When the book was finished, she read it with the children (see Figure 4.6).

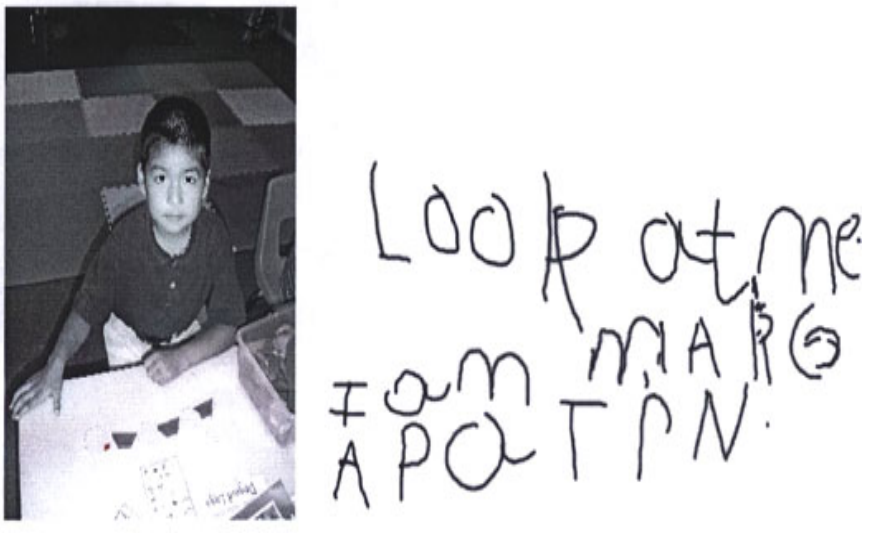

Figure 4.6. Look At Me page.

This activity worked on two areas of the Reading and Writing framework. It worked on Concepts of Print by helping the children to recognize that sentences in print are made up of separate words and to begin to understand that punctuation and capitalization are used in all written sentences. It worked on Writing by having the children write sentences to describe what

they were doing in their pictures, using phonetically spelled words to create meaning, and using capitalization at the beginning and punctuation at the end of each sentence.

Erin involved the children in several modes of meaning making within this activity. First, she used the graphics mode by incorporating digital photographs of each child doing something on the individual pages of the book. Second, she used the print mode by having the children write the two sentences on their page on the smart board with the electronic pens. Third, she involved the spatial mode by having the children write their sentences next to their picture on the smart board page. The children had to write the *Look at me* sentence above the *I am.…* sentence describing what they were doing in the picture.

Erin incorporated one of the new literacies into the *Look at Me* activity: screen writing. The children interacted with the smart board by writing their sentences on the screen using the available electronic pens. The child's screen writing was saved exactly as they produced it

Second daily dose of reading skills block.

Erin was observed using computer technology two times during the Second Daily Dose of Reading Skills Block. In one lesson she used the technology in a traditional way as chart paper. In the other activity, she used a website involving new literacies.

One activity during the Second Daily Dose of Skills Block involved working with the poem and song *Did You Ever See?* Her decision to use the technology was not part of her original teaching plan. It occurred as an intervention by the Literacy Coach.

Erin had the poem written on sentence strips in the pocket chart. She introduced the poem to the children by pointing to the first sentence, "Did you ever see a ____ in a _____?" She read this sentence to the children. Then the children read the words with her. Next she pointed to the blank lines in the sentence. She showed the children a word card with the word *sheep* on it. She

asked the children what the word on the card was. Several children made wild guesses. She told the children to sound out the word with her. She pointed to each sound as she said it. The children repeated the sound after her. Erin helped the children blend the sounds together to say the complete word. She put the word card into the pocket chart in the first blank of the sentence. Then she showed them a word card with the word *jeep* on it. She helped the children sound out the word and then blend the sounds together. Erin pointed out the "*_eep"* part of the word. She put the *jeep* word card into the pocket chart in the second blank line in the sentence. She had the children read the sentence. Then she had the children put two more *sheep* and *jeep* cards in the blank lines of the second sentence on the chart. She read the next two lines of the poem and then had the children read them with her. Finally, she had the children put the missing words *sheep* and *jeep* into the last sentence. She and the children read the entire poem together. She continued working with the children to fill in the blank lines of the poem using other rhyming words: (a) *bug* and *rug*, (b) *fox* and *box*, and (c) *bat* and *hat*. The children put the new pairs of rhyming word cards in the blanks of the poem in the pocket chart. Each time after putting the new rhyming words into the blank lines in the poem, Erin and the children practiced reading the poem. To end the lesson she brought up a list of songs on the smart board. She clicked on the *Did You Ever See?* title and the music file played. She used the smart board in a more traditional way as a CD player to play the music file that she had downloaded onto her laptop computer.

For their independent assignment, the children made a book about the poem. Erin gave each child a stapled book consisting of blank pages. She had them glue the title of the poem on the cover of the book. She gave them four sentence strips with *Did you ever see a _____ in a _____?* on them. She told the children to paste one sentence strip at the bottom of the first page. She also gave them a page with pairs of rhyming words on it. She told the children to fill in the

blank lines in the first sentence strip with the words *sheep* and *jeep*. After the children glued the rhyming words in the blank lines on the sentence strip they drew a picture to illustrate the sentence. Some of the children did not know what to draw for some of the words. Erin tried to explain what to draw. The Literacy Coach had come in to observe Erin's lesson and when she saw that the children did not know the meaning of the words, she found pictures on the Internet and displayed a picture of a sheep and a picture of a jeep on the smart board. She typed the picture word under each one. This helped the children understand what to draw for their illustration. The children continued working on the other pages of the book filling in the blank lines on each sentence strip with the pairs of rhyming words. To help them understand the rest of the words, Erin found pictures on the Internet for each pair of words and displayed them on the smart board. She typed the picture word under each one. The children drew a picture to illustrate the sentence on each page in the book (see Figure 4.7).

This activity worked on four areas of the Reading framework. It worked on Phonological Awareness by working on hearing that the two words end with the same rime but begin with different onsets as rhyming words. It worked on Concepts of Print by reinforcing that the text of sentences track from left to right as they read and work with the poem sentences. It worked on Vocabulary when pictures for the rhyming words were shown with the picture word typed below it on the smart board and reinforced the idea that some words such as *bat* can have more that one meaning. And it worked on Comprehension by using graphic features to help understand the text.

Erin involved the children in several modes of meaning making within this lesson when she started using the smart board. First she used the graphics mode by displaying pictures for each pair of rhyming words. Second, she used the print mode by typing the picture word under each picture. Third, she used the audio/music mode when she played the music file that had been

downloaded from a CD onto her laptop and when she had the children sing the words of the poem along with the music.

The *Did You Ever See?* lesson activity did not incorporate new literacies. The children did not interact with the smart board in any way. The smart board was used in a traditional way as if it were chart paper with pictures attached to it.

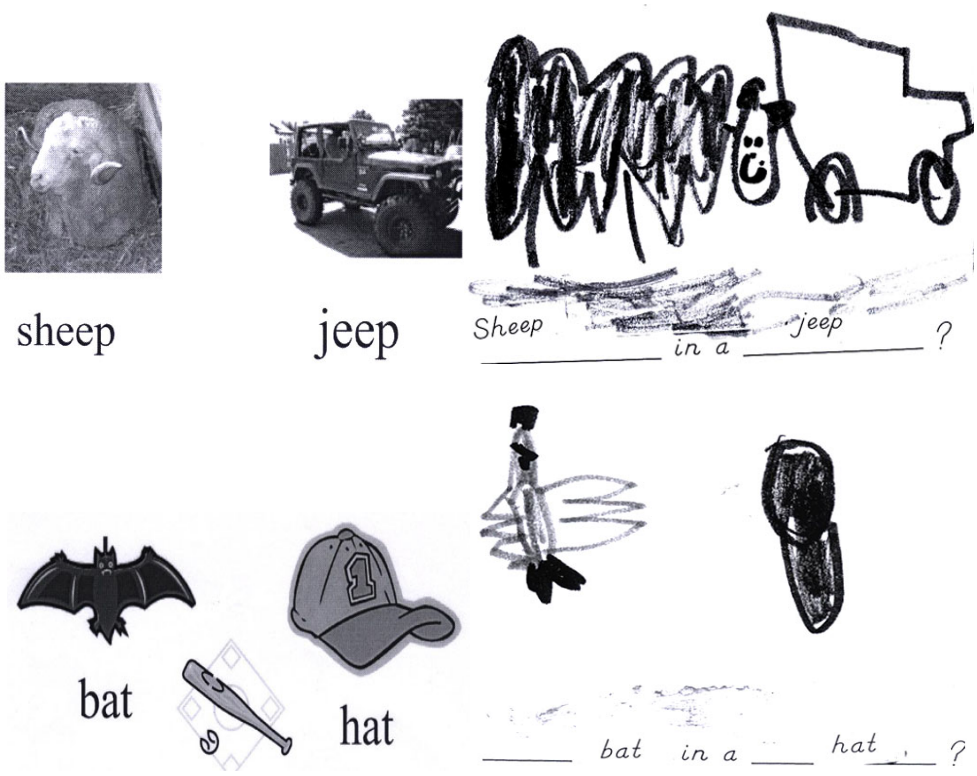

Figure 4.7. Did You Ever See? pictures and examples of children's book pages.

During another Second Daily Dose Skills Block lesson, Erin worked with the children on making words with the consonant-vowel-consonant (CVC) pattern. She set up three small dry-erase boards on chairs in front of the group. She named a CVC word and the children sounded out the beginning, middle, and ending sound in the word. She wrote the beginning letter on the first board, the middle letter on the second board, and ending letter on the third board. Erin pointed to each letter and made the sound for each letter. Then she blended the sounds together as she said the word. Next she and the children blended the sounds together.

To continue working of CVC words, Erin divided the children into three small groups. Erin worked with one small group of children building CVC pattern words with plastic magnetic letters on metal cookie sheets. She named a word and the children found the magnetic letters to make the word and attached them to the cookie sheet. The other groups of children worked in two centers. The first center read stories using an electronic Leap Pad storybook. The second center worked on a website ABC activity on the smart board about the letter sounds. This website is found at http://www.starfall.com/level-k/index/load.htm?f. In this website, the children touched an alphabet block on the first screen. A second screen appeared and the computer said the sound for the letter and showed an animated key picture for the sound of the chosen letter. The children clicked on the letter and another screen appeared. This screen showed a word beginning with the letter. The computer pronounced the picture word. The children clicked on the word and an animation for a picture word showed. Finally the children touched the arrow at the bottom of the picture word screen and were taken back to the first alphabet block screen to touch another alphabet letter in random order.

This activity worked on the Phonics area of the Reading framework. It reinforced the children's understanding of the relationships between print and spoken sounds and recognizing the upper- and lowercase letters of the alphabet.

This activity involved several modes of meaning making. First, it used the print mode to display the alphabet letters on blocks on the first screen. It also used the print mode to show the upper- and lowercase letter on the second screen, and the picture word on the third screen. Second, it used the animation mode when showing the key picture for the letter sound. It also used animation to illustrate the picture word that begins with the sound of the selected letter.

Third, it used the audio mode to name the letter selected. It also used audio to make the sound of the letter and pronounce the picture word.

This activity incorporated two new literacies while the children interacted with the website on the smart board: clicking and using touch screen links. First, the children clicked on an alphabet block. Next they clicked on the letter screen to hear the letter sound and see the key picture. They clicked on the letter to move on to the picture word screen. Then they click on the picture word to hear the computer pronounce the word and view the animation for the word. Finally, the children touched the screen link in the bottom right corner to return to the alphabet blocks screen to select a different letter.

Transitions.

Erin used the smart board as a classroom management technique for a short transition activity when the class finished their work early and there were a few minutes going to the Library, Art class, Music class, or Physical Education. Erin brought up *The Close-Up Game* website on the screen. This website is found at: http://www.sesameworkshop.org/sesamestreet/game/flash.php?contentId= 7085317. In this activity, the children saw a close-up picture of an object. They saw three full pictures on the right side of the screen. The children chose the picture they thought the close-up part belonged in. If the correct picture was clicked on, they received positive verbal reinforcement and the screen showed another close-up picture.

This activity aligned with the Comprehension area of the Reading framework. It required the children to use the information they saw in the close-up picture to make a prediction of which whole picture object the close up picture was a part of.

This activity involved two modes of meaning making. First, it used the graphics mode by illustrating two views of an object- the close-up picture and the whole picture. Second, it used

the audio/music mode by giving them verbal feedback about their predicted choice of the object.

This activity incorporated one of the new literacies while the children interacted with the smart board: clicking. The children predicted what they thought the close up picture belonged to and clicked on one of the three picture choices.

Summary of Findings for Erin

The purpose of my study was to investigate teachers' perceptions and practices on using computer technology to facilitate literacy instruction in early childhood classrooms. My within-case analysis looked at the alignment of Erin's perception and practice on using technology.

Erin uses a socio-cognitive approach to her teaching. She wants her children to work cooperatively during many lessons and learn from each other. She encourages them to talk, touch, play, explore, sing, and be very actively involved in learning. She views her role as the teacher to be a facilitator of learning.

Erin's smart board is installed in the front of the classroom where she has the children gather for whole group instruction. This location allows the children to actively participate and encourage each other during lessons. The classroom is organized around this large, open area. Around the edge of this area are tables where the children can work individually, yet they can still see the smart board while sitting at the tables (see Figure 4.8).

Erin's used the smart board spontaneously. There were times she would suddenly decide to implement the smart board within an activity. Sometimes this decision worked out well and things went the way she wanted it to. At other times, it did not work at all. She did not preplan the use of the smart board very often. This sporadic use of the smart board usually resulted in some disruption to what was going on in the classroom at the time. The children got excited and there was off-task behavior during these times. It was difficult for her to get the children back

on-task. Erin's use of the smart board would fall within Reality 1 on the Multiple Realities continuum.

Figure 4.8. Erin's smart board in her classroom.

While doing the within-case analysis several gaps (misalignments) appeared between Erin's perceptions about using technology and her practices (see Figure 4.9).

Erin: Within-case Gaps between Perception and Practice

Perceptions	Practices
Technology available	Technology not used
Amount of time she thinks she uses technology	Amount of time technology is actually used
Technology is always engaging for the children	Children's engagement
Technology always facilitates instruction	Children's ability to complete independent assignment
Perception about training available	Training she took
Accountability for using technology in instruction	Accountability expectations for use by the principal
Perception about support available	Support not accessed

Figure 4.9. Gaps between Erin's perceptions and practices.

The first gap is between her perception of technology that is available for use in her literacy instruction and technology that is not being using. Erin's Kindergarten classroom has a new interactive smart board connected to her teacher laptop that has wireless Internet access. She uses this technology in a very spontaneous way. During the first interview, when talking about how prepared she felt about using technology in her literacy instruction she said,

> If I was more prepared I would have a lot of it in my lesson plans. A lot of times I use the sites that different teachers give me…like I'm going to go do that in my classroom right now so I'm real spontaneous about it.

As a result of her spontaneous approach and sporadic use, there are many literacy lessons that she could have incorporated technology into but she did not use it.

Another example of technology that is available is a desktop computer she has in her classroom. This computer is designated for student use only. It has access to software programs on the district server that can be downloaded for the children to use, but instead the computer sits on a small desk next to the teacher's desk and is not used at all.

The second gap is between her perceptions of the amount of time she thinks she uses technology and the actual amount of time technology was used during the literacy instruction block. Erin rated her frequency of computer technology use during literacy instruction as Moderate. Moderate was defined on the first questionnaire as implementing computer technology on a fairly regular basis. When I went over the questionnaire with the teachers before they rated their frequency of use, I told them to use two to three times a week as a guideline for Moderate use. During the time period that I observed in Erin's classroom, she used the smart board during 10 of the 13 observation visits or 76% of the time. During eight of the ten observations (80%), she used the smart board for a lesson or activity in a single learning episode

of the literacy instruction block. During five of the ten observations (50%), she used the smart board for lessons or activities in multiple learning episodes.

She was asked what percentage of time she used technology in her literacy instruction during the second interview. She felt she used technology about 50% of the time. The literacy instruction block consists of four scheduled learning episodes: the Morning Meeting, Reader's Workshop, Writer's Workshop, and the Second Daily Dose of Reading Skills Block. There were 52 learning episodes over the period of the scheduled observations. Looking at the number of learning episodes during the literacy instruction block in which she used technology in her instruction or involved the children in literacy activities compared to the total number of learning episodes, Erin used computer technology in only 34% of the 52 scheduled literacy instruction block learning episodes. Each literacy instruction block was 180 minutes long for a total of 2,340 minutes of scheduled literacy instruction time. The amount of time she used technology in her literacy teaching and for the children to participate in literacy-related activities involving technology totaled 370 minutes. Therefore, she used technology for her literacy instruction 15% of the total available literacy instruction block time.

The third gap is between her perception that using technology is always engaging for the children and the children's engagement. To look at this gap, I looked at the children's off-task behavior. In Erin's classroom, technology was used in two ways: (a) in traditional ways such as chart paper, a CD player, a video player, or a digital photo album, and (b) involving new literacies. During 76% of the learning episodes involving technology, the smart board was used in traditional ways. In 24% of the learning episodes involving technology, her use of the smart board involved the use of new literacies. When she used technology in traditional ways, 54% of the time the children were passively involved, and 46% of the time they were actively involved.

When she used technology involving new literacies, 26% of the time the children were passive, and 74% of the time they were active. In looking at the children's behavior during lessons and activities when technology was used in traditional ways, there was 38% off-task behavior. During lessons and activities when technology involved using new literacies, there was 33% off-task behavior.

The fourth gap is between her perception that technology always facilitates instruction and the children's ability to complete the independent assignment using what they worked on during the instruction. For the assignments connected with a lesson or activity that used technology in a traditional way, 41% of the time the children could not complete the assignment on their own. For assignments connected with a lesson or activity that used technology involving new literacies, 23% of the time the children could not complete the assignment. Erin does not seem too concerned if the children have difficulty connecting what they do with the technology and what they do independently on their assignment.

The fifth gap is between her perception of the training that is available and the training she has decided to take part in. On the second questionnaire, Erin was asked about how prepared she felt to use computer technology in her literacy instruction. She responded that she felt somewhat prepared and said she feels there is so much more out there to learn. She also said that she wished she knew more websites and strategies to use in her teaching and had more time to learn and prepare lessons. When asked how often training is offered to teachers during the first interview she responded that teachers are given different chances to get PLUs for technology training but did not feel she needed to take that training because as she grew up she was taught to use a computer. She felt the older generation is the ones taking these PLU technology trainings. She did not respond when asked how often trainings were offered.

On the second questionnaire she was asked to list any technology training she had taken. She listed only one basic training workshop on using the features of the smart board that was required of all the teachers after the smart boards were installed in their rooms. In the interview with the Literacy Coach I asked about how many training courses had been offered since the beginning of the school year. She referred me to a technology specialist in the school district technology office. The technology specialist sent me a list of offered training courses. From the beginning of the school year until the end of November, six technology-training courses had been offered to the teachers at this school. Two of the technology-training courses were on the use of the smart board and one of the technology trainings was specifically a literacy workshop.

When asked whether taking the smart board training affected her decisions about using technology in her literacy instruction, she replied, “It made me more confident. We met twice for about an hour or two and the more I play around with it, the more comfortable I am.” So, even though she feels the training she has taken was beneficial for her and she feels there is much she needs and wants to learn about using the smart board technology for her instruction, she has not enrolled in any of the offered technology training.

The sixth gap is between her perception of her accountability for using technology in her instruction and the Principal’s expectation for the teachers’ use of technology. During the second interview Erin was asked how teachers were held accountable for using technology in their instruction. She replied that teachers are not held accountable at all. Even though teachers are required to attend some mandatory technology workshops, they never have to use it in the classroom. However, she did feel it would be a good idea to use technology when the Principal came in to observe a lesson. After talking a little further about having the smart board technology in the Kindergarten classrooms, she added that the only accountability the teachers felt they were

held to was if the Literacy Coach came in to observe a lesson and suggested a way to do something involving technology. The Literacy Coach expected them to try out her suggestions.

While interviewing the Principal, she was asked about teacher accountability for using technology within their instruction. She said that using technology is an expectation she has told the teachers she has, but some teachers understand that expectation better than others. She mentioned that when she goes into their classrooms to do a teacher evaluation, she is looking for their use of technology. She would like them to be much farther along in their use of technology and in what they can do with the smart boards.

When the Literacy Coach was asked about accountability of the teachers to use technology, she responded that the Principal has told the faculty that they are supposed to be using the technology and she's looking for its use. She also said the teachers know that when they are being evaluated by the Principal or Assistant Principal, it's their job to use the technology. It is their professional responsibility to work the technology into their lessons.

Therefore, even though the Principal has made her expectations known to the faculty, Erin thinks that it is a teacher's personal choice as to whether are not to use technology. She does not feel there is pressure to increase her use of technology.

The last gap is between her perception of the support that is available for teachers to use technology and the support that has not been accessed. Erin feels that the Kindergarten teachers support each other in their use of technology during literacy instruction. She also feels that the Principal and the Literacy Coach support the teachers' use of technology. But, she did not mention any other sources of support available for the teachers.

When the Literacy Coach was asked about who offers teachers support for using technology in their instruction, she said that the school district is pretty good at providing

technology support through the Technology Specialist that works with the school. He provides teachers with support if they request it as a grade level or as just a group of teachers who want to learn about something specific related to technology. If the teachers as a grade level or a group want to learn about something specific related to technology, he would develop a class to support their learning.

The Media Specialist is another source of support for the teachers. She works as a troubleshooter for some computer problems if teachers are having trouble with their classroom technology. She also works with the teachers if they request something technology related for the classroom and buys things when there is money available.

Even though there are sources of support for the teachers use of technology both in and out of the school beyond the Principal, Literacy Coach, and other grade level teachers, Erin has not accessed that support and it does not seem to be something she is aware of.

Within-case Findings: Danielle

Who is Danielle?

Danielle is a veteran teacher. She has been teaching for fifteen years. She has taught at the Kindergarten level for three years. She has also taught at the First, Second, Third, and Fourth grade levels. She has taught in two Georgia counties and at two different schools within her current school system. She is a native Georgian and grew up in the city she teaches in. She is in her mid-thirties, is married, and has young twin boys.

Danielle believes that her teaching style allows children to learn more by doing. She believes in using interactive lessons and activities because the more the children get to move their bodies or use manipulative objects the more they enjoy themselves while learning and retain the information. She believes in creating a fun, risk-free environment that is structured in a

way to provide boundaries without confining the children. She wants to have a friendly, caring community among adults and children in her classroom.

Danielle defines literacy as a patchwork quilt of components that are all sewn together, yet can be enjoyed individually. Those components include: (a) read-alouds, (b) shared reading, (c) guided reading, (d) independent reading, (e) conversations about books, (f) phonics studies, (g) shared and guided writing, (h) independent writing, and (i) conversations about students' pictures and writing. Some components are more teacher-focused and less risky. Some components are more student-focused and allow independence. And some components have both student- and teacher-controlled portions of lessons and activities.

Danielle believes that the most important thing in teaching literacy is showing her excitement, enthusiasm, and love of reading and writing. She feels that her children will begin to pick up on her feelings about reading and writing and feel the same way. She tries to set up her lessons in a way that can be enjoyed. She wants the children to celebrate their successes with others. She feels the more children realize they can do, the more they will be willing to try. By gradually letting them try things, the more they will trust themselves to be able to do things.

She describes herself as very structured. She has a routine in the classroom and the class follows it. She is very organized. There is a place for everything and everything is in its place. She believes things should be displayed in the classroom but does not go overboard with "stuff" because it's too much stimuli for the children if you put too much up. She is very clear about her expectations and the consequences if the children don't follow those expectations. She tries to establish a relationship on a personal level with the children because she wants them to know that she likes them as a person, she respects who they are, and to give them some room to be who they are as long as they follow her expectations for their work and behavior. She believes that the

more they do during lesson time, the more they're going to learn so she tries to give them opportunities to be more hands-on.

Self-rating on Computer Technology Use

On the first questionnaire, Danielle rated herself on her use of computers in several aspects: (a) her general use of computer technology, (b) her use of computer technology in her teaching in general, (c) her use of computer technology in her literacy instruction, and (d) the frequency of her computer use during literacy instruction.

General Use of Computer

Danielle describes herself as more than average but not quite to the advanced level as a computer user. She feels rather comfortable using computers. She describes herself as knowledgeable about many aspects of the computer, the Internet, and numerous other software programs (see Figure 4.10).

Figure 4.10. Danielle's general use of computer technology scale.

Computer Use in Teaching in General

She describes her use of computer technologies in her teaching in general as more than average and closer to advanced. She states that she is always wiling to incorporate technology and is usually successful. She often shares her ideas with co-workers. She often gets positive feedback on her ideas (see Figure 4.11).

Figure 4.11. Danielle's use of computer technology in teaching in general scale.

Computer Use in Literacy Instruction

For her use of computer technologies during her literacy instruction, she describes herself as midway between the average and advanced level of computer use in her literacy instruction. She believes she uses technology at least twice a week during her literacy block. She tries to use it in a variety of ways and thinks the children enjoy it and seem to learn well (see Figure 4.12).

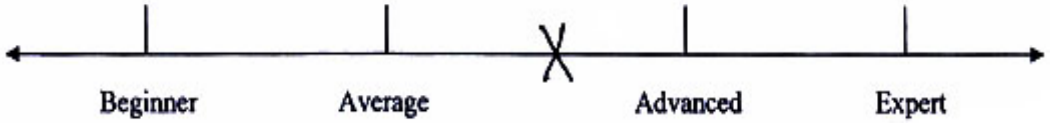

Figure 4.12. Danielle's use of computer technology in literacy instruction scale.

Frequency of Computer Use during Literacy Instruction

Frequency of computer use was defined on the questionnaire at three levels: (a) Occasional Use, (b) Moderate Use, and (c) Frequent Use. These levels of use were given as guidelines for the teachers to use as they rated their frequency of use. Danielle describes the frequency of her computer use during her literacy instruction as Moderate (see Figure 4.13).

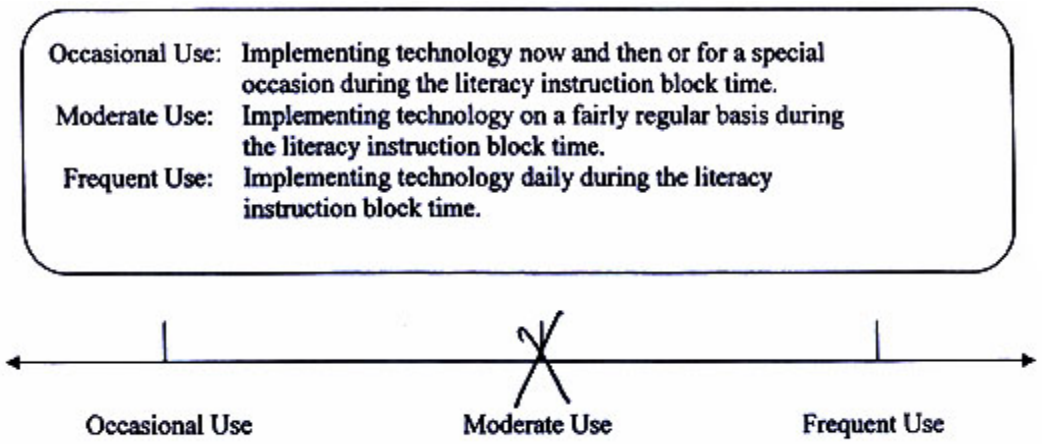

Figure 4.13. Danielle's frequency of computer technology use during literacy instruction.

Research Questions

In this section I look at each of my research questions for Danielle. I begin by looking at the first question: What perceptions do teachers have about using technology during literacy

instruction in early childhood classrooms? I conclude by looking at the remaining questions: (a) What technology are teachers using to facilitate literacy instruction in early childhood classrooms? (b) What modes of meaning making are being supported through the use of technology during literacy instruction? and (c) What new literacies are being used during literacy instruction? as I describe Danielle's use of computer technology for the literacy instruction block during the classroom observation visits.

Perceptions About Using Technology

Danielle believes technology is a tool that should be used to enhance instruction. She feels it is important to present new information in a variety of ways because children learn in different ways. Technology offers children many ways to view information and it grabs their attention. She feels it is important not to have the children get so caught up in the technology itself or they might miss the actual concept being taught. Making the concept of the lesson the focus and using technology as merely a tool can maintain correct focus. She believes that technology has helped her literacy teaching by giving her another means to instruct the children and giving the children another way to practice their skills. She feels it raises their level of enthusiasm for a lesson. She also thinks that the Internet gives her access to more ideas, lessons, and materials for literacy learning.

She feels that using technology fits with her teaching philosophy because there are ways to integrate computer technology so students get to do things that are more guided by the teacher in the beginning until the children are comfortable with it and then they can do it more independently. Technology gives children another arena to see how letters become words and words become sentences. It also gives them the chance to use other means of learning besides books. She feels the novelty of the smart board and computer give children more motivation to

pay attention. Children want to do activities on the smart board so they're more focused on what they are doing. She tries to get other ways to do things to get the information across to the children.

Danielle feels that the earlier children can become exposed to the computer the better they are going to be when they get older. She feels they need to know what the words on the taskbar mean, how to manipulate the mouse and keyboard, to recognize the letters and where they are located on the keyboard, and to learn about the Internet.

Technology Used, Modes of Meaning Making, and New Literacies

The literacy block in the Kindergarten classrooms is divided into four learning episodes: (a) Morning Meeting, (b) Reader's Workshop, (c) Writer's Workshop, and (d) Second Daily Dose of Reading Skills Block. The teachers follow an English Language Arts framework of performance standards for reading and writing when they are planning their literacy instruction. The reading performance standards are divided into six areas: (a) Concepts of Print, (b) Phonics, (c) Phonological Awareness, (d) Vocabulary, (e) Fluency, and (f) Comprehension. There is one performance standard for writing. Appendix V includes the English Language Arts Framework for Kindergarten.

Danielle was observed using the smart board, her laptop, and Internet websites to engage the children in activities during Morning Meeting, Reader's Workshop, and the Second Daily Dose of Reading Skills Block episodes at various times. She also used the smart board for classroom management short transition times when the class finished early and there were a few minutes before moving on to the next learning episode or before the class went out for recess or to one of their special classes: Art, Music, Library, or Physical Education.

Morning meeting.

To begin each school day, Danielle announced the two lunch choices for the day. She had the children decide what they wanted to eat for lunch. To take the lunch count, she had the children go to the smart board individually, touch their name to select it, then click and drag their name onto the chart under their lunch choice (see Figure 4.14). When all the children had moved their names, Danielle used her laptop computer to send the lunch count to the school office.

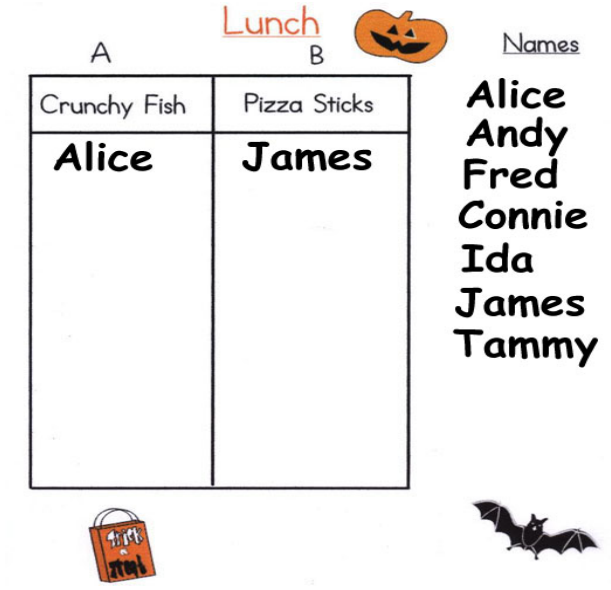

Figure 4.14. Daily lunch count chart.

Doing the lunch count used the smart board to perform a functional task involving only one mode of meaning making. It used the print mode to list the children's names and to put the lunch entrée choices at the top of the chart columns.

This activity involved several new literacies: clicking, dragging, and navigating on the screen. When the children went to the smart board, they clicked on their typed name to select it. Then they dragged their name over onto the lunch chart. This activity required them to navigate on the screen to get their name into the column for the lunch entrée they wanted to eat that day.

After lunch count was taken, Danielle involved the children with the smart board to work on several daily classroom routines. The first routine was reading the morning message. Danielle created the daily morning message on her laptop computer. She displayed the message on the smart board. She had the children read the message as a group while she helped the line leader for the day track the print on the screen with a pointer (see Figure 4.15).

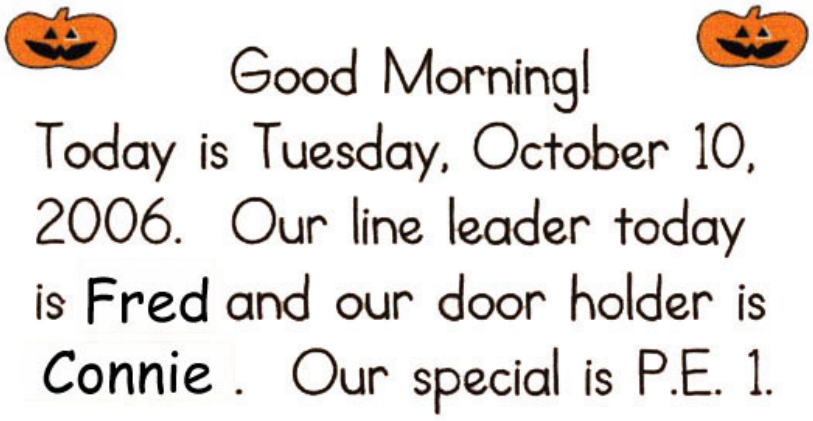

Figure 4.15. Morning message.

With the Morning Message, Danielle worked on two areas of the Reading framework. First she worked on the Concepts of Print area by giving the children an opportunity to recognize that print can inform, to understanding that print has meaning and represents spoken language in written form, and for tracking text from left to right and top to bottom. It also worked on the Fluency area by giving the children the opportunity to practice reading orally with accuracy and expression.

This activity involved only one mode of meaning making. It used the print mode to display the typed morning message.

This activity did not incorporate new literacies. The children did not interact with the smart board. The smart board was used in a traditional way as if it were chart paper with the Morning Message printed on it.

The next routine was calendar time. For this activity she used two screens. She began by displaying the days of the week chart on the screen. She had the children read the days of the week with her as she pointed to them. Then she asked what day it was. She put a symbol next to the name of the day it was. She demonstrated how the symbol would be moved each day on the screen to show the current day (see Figure 4.16).

Figure 4.16. Days of the week chart.

On the second screen Danielle had the children work with the monthly calendar. She displayed the calendar on which she had inserted some text to let the children know what would be happening during the month. She directed the children's attention to the calendar. She asked what month it was. Then she asked the children what day of the week it was. Next she asked what the number for the day was. Then she asked the children what year it was. Danielle asked the helper for the day to look at the calendar and decide what symbol to put in the day's box. The child had three symbols from which to choose. The child clicked on the symbol to select it. Then the child dragged the symbol into the correct space for the day. When several symbols had been placed on the calendar, Danielle went over the pattern that had been created. Then she had the class read the day and the date with her (see Figure 4.17).

The calendar time activities worked on two areas of the Reading framework. First, it worked on the Concepts of Print areas by having the children recognize that print and pictures on the monthly calendar have meaning and can give them information. It also aligned with the Writing area by having the children work on a left-to-right pattern.

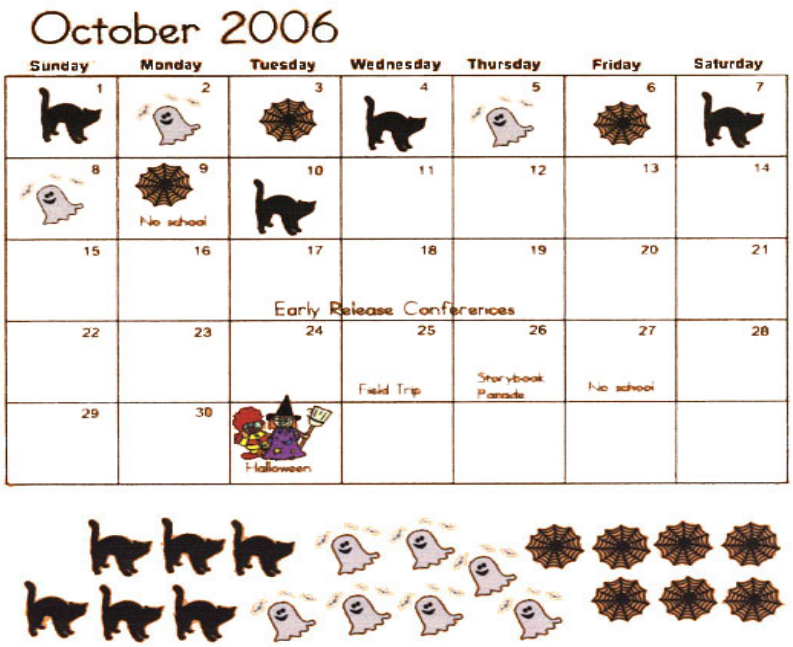

Figure 4.17. Monthly calendar.

This activity involved several modes of meaning making within the calendar time. The print mode was used to type the days of the week chart and to add text and numbers to the calendar grid. The graphics mode was used to add symbols on the calendar to create a pattern that the children identified and continued and to identify a holiday at the end of the month. The spatial mode was used when the children moved the symbols onto the correct calendar square and to develop the left-to-right pattern.

Danielle incorporated several new literacies into this activity: clicking, dragging, and navigating on the screen. The children clicked on the symbol on the days of the week chart to show what day it was. They also clicked on a symbol to put on the calendar to create or continue

a pattern. Once the symbol had been decided upon for the calendar, the children had to drag it to the correct box on the calendar. Moving the selected symbol to its correct space required the children to navigate the symbol on the screen.

The next routine was the weather chart. Danielle selected a child to go to the classroom door and look outside. The child reported what the weather for the day was. Then that child filled in the weather chart on the smart board. First the child decided on the color he or she wanted to use. Danielle selected the color and the child touched the smart board using his or her finger to color in the space on the chart (see Figure 4.18).

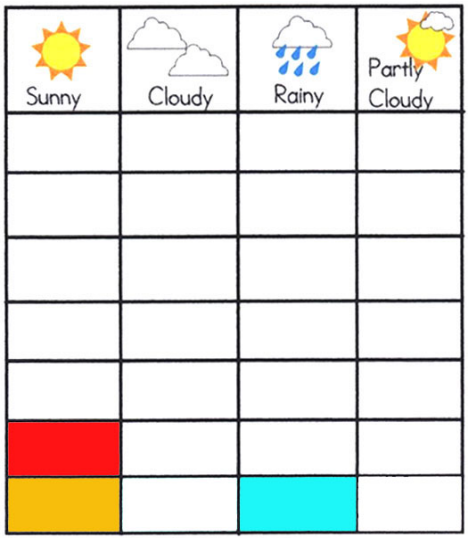

Figure 4.18. Weather chart

This activity worked on the Concepts about Print area of the Reading framework. The weather chart included print words and symbols to help the children recognize that symbols and labels on the chart can inform them about the weather by looking at the chart.

This activity involved three modes of meaning making. First, it used graphics mode to represent different types of weather. Second, it used the print mode to identify what the symbols on the chart represent. Third, it used the spatial mode to create a graph displaying the kinds of weather that were reported and how many days each type of weather occurred.

This activity incorporated one of the new literacies: a form of screen writing. The child working on the chart had to use their finger as an electronic marker to color in the space on the chart.

Reader's workshop.

One day, Danielle used Reader's Workshop time to work on a school-wide activity for the school's Hispanic Heritage Night taking place that evening. Each of the classes was asked to have the children make tissue paper flowers and wear the flowers during the school day. The directions for making the flowers had been emailed to all the teachers (see Figure 4.19).

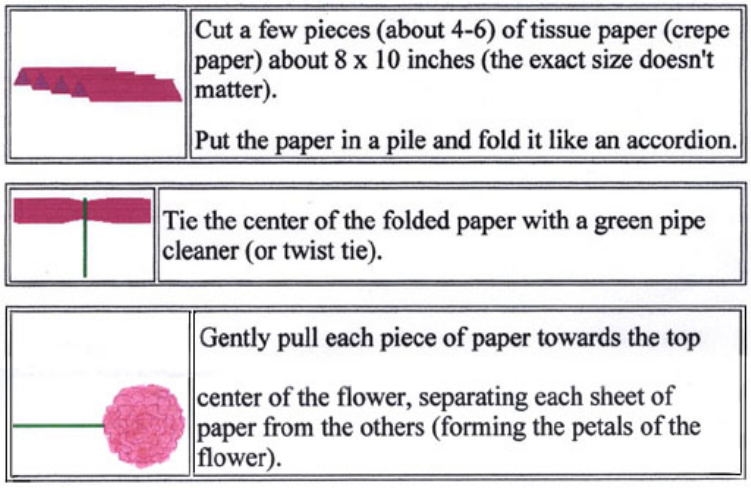

Figure 4.19. Directions for the tissue flower activity.

Danielle displayed the directions that needed to be followed to make the flowers on the smart board. She introduced the activity and why the children were going to do it. Then she read the directions step by step to the children. She told the children they would use two colors of tissue paper in their flowers and what the color choices were. As she went from table to table, the children told her what colors they wanted to use. She demonstrated how to fold the paper like an accordion. She reread the first step and had the children fold their tissue paper. There were two other adults in the room to help the children with the folding of the tissue paper. Then she reread

the second step of the directions. She told the children that the adults would help them tie the pipe cleaner tightly so their flower would not fall apart. When all the pipe cleaners had been tied, she reread the third step of the directions. She demonstrated how to gently separate the pieces of tissue paper to form the petals. The children pulled the layers of tissue paper apart carefully. Danielle helped the children form the paper petals to look like a flower. As the children finished the flower, she had them put it in their storage cubby until after recess.

Second daily dose of reading skills block.

One activity in which Danielle used the smart board during the skills block time worked with the *Did You Ever See?* poem. She began by reading the poem aloud. She told the children they would work with colored rhyming words. She had the children read the pairs of rhyming words. She demonstrated how to click on the word *sheep* and drag it into the blank space in the second line. Then she clicked on the word *jeep* and dragged it into the second blank space in the second line. After she filled both blank spaces, she read the sentence aloud. She moved to the second sentence. She had a child click and drag the word *sheep* into the first blank space. She had another child click and drag the word *jeep* that belonged in the second blank space. For the last sentence she had two children click and drag the rhyming words into the blank spaces. Then the children read the entire poem with her. She reset the screen to show the poem again with the blank lines and worked with other pairs of rhyming words (see Figure 4.20).

This activity worked on three areas of the Reading framework. It worked on Phonological Awareness by having the children identify the rhyming words to fill in the blank spaces. It worked on Concepts of Print by helping the children track the print from left to right as they read each sentence in the poem. And it worked on Fluency by giving the children an opportunity to practice reading the poem smoothly and accurately.

This activity involved only one mode of meaning making. It used the print mode to display the typed poem on the screen.

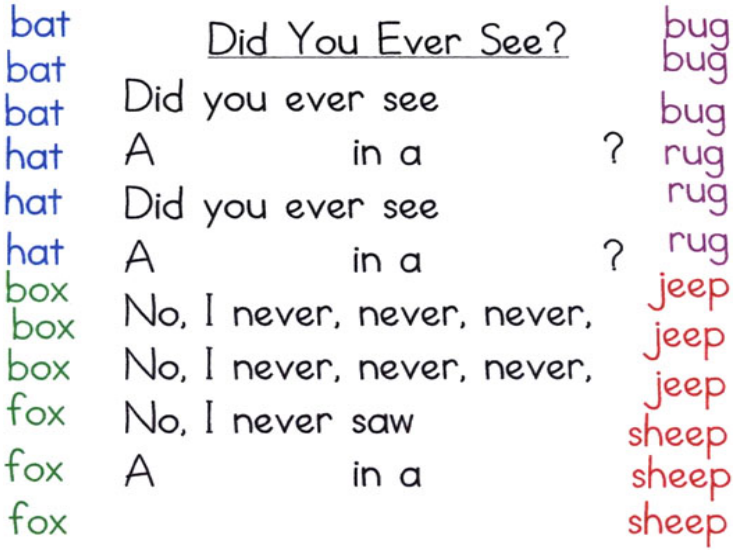

Figure 4.20. Did You Ever See? poem activity.

This activity incorporated three new literacies: clicking, dragging, and navigating on the screen. The children clicked on the word needed to fill in a blank space in the sentences. Once the word had been clicked on, the children dragged it to the correct blank space in the poem. Moving the selected symbol to its correct space required the children to navigate the word on the screen.

Another activity Danielle used during the Second Daily Dose of Reading Skills Block worked with the *Five Little Pumpkins* poem (see Figure 4.21). She began the lesson by displaying the poem on the smart board. She inserted graphic symbols into the poem. She also inserted a graphic symbol at the end of each line. She read the poem and told the children to remember the picture at the end of the line. Then she had the children read the poem with her.

Next she brought up another screen of a picture of five little pumpkins sitting on a fence (see Figure 4.22). Above each pumpkin was a thinking bubble. Also on the screen were the pictures that had been at the end of each line of the poem. She told the children that they would

put what each little pumpkin talked about in the poem into the thinking bubble above it. She called on a child to find the picture that the first pumpkin thought about in the poem. The child clicked on the “watch” and dragged it into the first thinking bubble. She continued choosing children to find and put the rest of the pictures into the thinking bubbles for the other pumpkins. The second child clicked on the “witch” picture and dragged it above the second pumpkin. The third child clicked on the “face” picture and dragged it above the third pumpkin. The fourth child clicked on the “balloons” picture and dragged it above the fourth pumpkin. The fifth child clicked on the “running person” picture and dragged it above the fifth pumpkin. Then Danielle and the children reread the poem and she pointed to what each pumpkin talked about in each sentence.

This activity worked on three areas of the Reading framework. It worked on Concepts of Print by having the children recognize the print and pictures can help them enjoy a poem and by tracking text from left to right and top to bottom. It worked on Fluency by giving the children the opportunity to practice reading the poem smoothly and accurately. And it worked on Comprehension by having the children retell what the pumpkins talked about in the poem in the order it happened.

This activity involved two modes of meaning making. First, it used the print mode to display the typed poem on the screen. Second, it used the graphics mode to illustrate what the pumpkins talked about in the poem.

This activity incorporated three new literacies: clicking, dragging, and navigating on the screen. The children clicked on the picture to activate it. Then they dragged the picture to the thinking bubble above the correct pumpkin. Doing this activity required the children to navigate on the screen when moving the picture to the correct pumpkin on the fence.

Figure 4.21. Five Little Pumpkins poem.

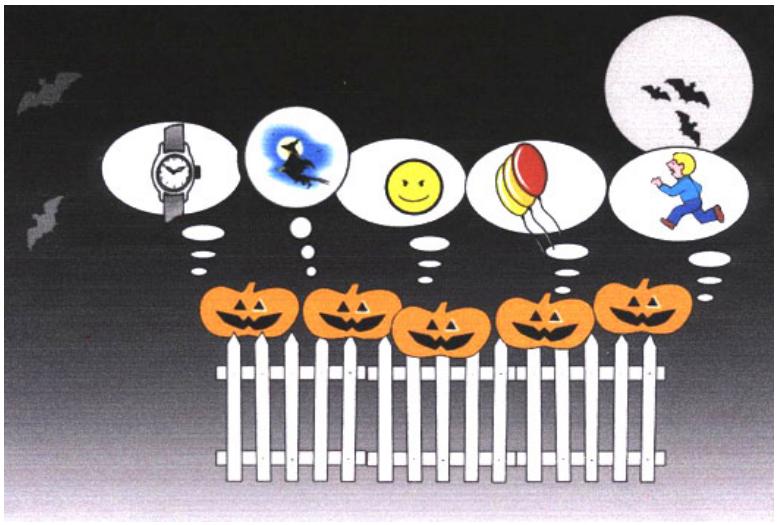

Figure 4.22. Five Little Pumpkins activity.

Transitions.

Danielle also used the smart board as a classroom management technique as a short transition activity when the class finished their Second Daily Dose Skills Block work early and there were a few minutes before the class went to one of their special classes: Art, Music, Library, or Physical Education. One day she brought up *The Berenstain Bears Matchbook Game*

website on the smart board. This website is found at http://pbskids.org.kids.us/games/matchbook/index.html. In this activity, the children picked two books on the screen to reveal the Berenstain character behind it. The children clicked on two books at a time to see if the pictures behind the books matched. If the characters revealed matched the books disappeared. If the characters did not match the books reappeared on the screen. When the children found all the matching characters, Danielle told the children how many tries it took them to find them all. She told the children they had to remember where a character was if they didn't find a match. She played the game until it was time to go to their scheduled special class.

This activity was intended purely as a fun activity. It gave the children the opportunity to play a memory game on the smart board.

This activity involved one mode of meaning making. It used the graphics mode to show the Berenstain Bears characters for the children to match.

This activity incorporated one of the new literacies: clicking. The children clicked on two books and tried to make a match of the characters behind the books.

Summary of Findings for Danielle

The purpose of this study was to investigate teachers' perceptions and practices on using computer technology to facilitate literacy instruction in early childhood classrooms. My within-case analysis looked at the alignment of Danielle's perception and practice on using technology.

Danielle uses a direct instruction approach to her teaching. She believes in strict discipline and expects her children to be very quiet and follow her instructions. The children in her class are not allowed to be off-task. She monitors what they are doing continuously and gives them very little non-directed time.

Danielle's smart board is installed in the front of the tables where she has the children do their individual work. Having it in this location encourages the children to be passive observers of what is done on the smart board because only one child at a time interacts with the smart board. There is little if any talking among the children when someone is interacting with the smart board. When the children are in the area where she does her whole group instruction, the children cannot see the smart board (see Figure 4.23). Danielle's use of the smart board would fall into Reality 1 on the Multiple Realities continuum.

Figure 4.23. Danielle's smart board in her classroom

Several gaps (misalignments) appeared between Danielle's perceptions about using technology and her practices during her literacy lessons during the within-case analysis (see Figure 4.24).

The first gap is between her perception of technology that is available for use in her literacy instruction and technology that is not being using. Danielle's Kindergarten classroom has a new interactive smart board connected to her teacher laptop that has wireless Internet

access. She uses this technology in a very teacher-directed way. On the second questionnaire, when asked about how prepared she felt about using technology in her literacy instruction, she responded that because she has eight years of experience using computers in her classroom, she is comfortable with basic programs and how to work with the Internet. She also wrote that she has many ideas on how to incorporate what she knows into her literacy instruction and doesn't mind taking risks and trying new things.

Danielle: Within-case Gaps between Perception and Practice

Perceptions	Practices
Technology available	Technology not used
Amount of time she thinks she uses technology	Amount of time technology is actually used
Technology is always engaging for the children	Children's engagement
Technology always facilitates instruction	Children's ability to complete independent assignment
Accountability for using technology in instruction	Accountability expectations for use by the principal
Perception about support available	Support not accessed

Figure 4.24. Gaps between Danielle's perceptions and practices.

Danielle wrote a 21st Century Model Classroom technology grant in 2005. In the application for the grant Danielle was asked to explain her vision of a 21st Century Classroom. Her vision was of a classroom environment that is rich in literacy and the learning of reading and writing included a variety of technologies available for the students to use on a daily basis to enhance their understanding of the literacy concepts being taught, but also to build their background knowledge and engage them in the learning process. She felt it was imperative that the use of technology be completely meshed with her teaching of reading and writing. She

wanted a seamless integration of literacy teaching and the use of technology and to give her students a strong base for technology use. She wanted her students to be able to use technology confidently and independently. To create a more technology rich environment in her classroom, she requested a class set of laptops with wireless access for the children to use as well as skills practice software and creativity software.

Danielle received the technology grant. She received a class set of laptop computers and was told that she would be receiving the wireless access for the computers. These were considered part of the "Basics" of the grant. She only received some of the "Extra" equipment and software that she requested. She has these laptop computers sitting on a shelving unit in her classroom but has not used the laptops with the children even though they could be used without wireless Internet access. She has been waiting for the wireless access hub to be installed. During the observation period she was notified that she would not be getting the wireless hub.

When asked why she did not use the laptops without the wireless during the second interview she responded,

> I could get another hub and they could all be plugged up and have access to the Internet, but that's not practical with 5- and 6-year-olds and thirteen computers all over the classroom with plugs coming out of them…that's just a safety hazard that I'm not willing to take. I'm having to regroup and rethink how do I go about using this instructionally when I can't use it the way I intended which was for each child to have their own laptop after they've been taught how to use it in small groups, to use throughout the course of the year when it is appropriate in lieu of paper and pencil.

Therefore, even though Danielle has laptop technology available for each of her children to use, the computer equipment remains unused on the shelves in her classroom.

The second gap is between her perceptions about the amount of time she thinks she uses technology and the actual amount of time technology was used during the literacy instruction block. Danielle rated her frequency of computer technology use during literacy instruction as Moderate. Moderate was defined on the first questionnaire as implementing computer technology on a fairly regular basis. When I went over the questionnaire with the teachers before they rated their frequency of use, I told them to use two to three times a week as a guideline for Moderate use. During the time period that I observed in Danielle's classroom, she used the smart board during 12 of the 13 observation visits or 92% of the time. During eight of the 12 observations (66%), she used the smart board for a lesson or activity in a single learning episode of the literacy instruction block. During five of the 12 observations (41%), she used the smart board for lessons or activities in multiple learning episodes.

She was asked what percentage of time she used technology in her literacy instruction during the second interview. She felt she used technology about 30% of the time. The literacy instruction block consists of four scheduled learning episodes: the Morning Meeting, Reader's Workshop, Writer's Workshop, and the Second Daily Dose of Reading Skills Block. There were 52 learning episodes over the period of the scheduled observations. Looking at the number of learning episodes during the literacy instruction block in which she used technology in her instruction or involved the children in literacy activities compared to the total number of learning episodes, Danielle used computer technology in only 30% of the 52 scheduled literacy instruction block learning episodes. Each literacy instruction block was 180 minutes long for a total of 2,340 minutes of scheduled literacy instruction time. The amount of time she used technology in her literacy teaching and for the children to participate in literacy-related activities

involving technology totaled 430 minutes. Therefore, she used technology for her literacy instruction 18% of the total available literacy instruction block time.

The third gap is between her perception that using technology is always engaging for the children and the children's engagement. To look at this gap, I looked at the children's off-task behavior. In Danielle's classroom, technology was used in two ways: (a) traditional ways such as chart paper, flashcards, or a photo album, and (b) involving new literacies. During 53% of the learning episodes involving technology, the smart board was used in traditional ways. In 47% of the learning episodes involving technology, her use of the smart board involved the use of new literacies. When she used technology in traditional ways, 89% of the time the children were passively involved, and 11% of the time they were actively involved. When she used technology involving new literacies, 13% of the time the children were passive, and 87% of the time they were active. Danielle uses a Direct Instruction approach to teaching and uses strict discipline about student behavior. With her style of teaching and her discipline, the children are not given opportunities to be off-task because she controls what they do and when they do it throughout an activity. However, she also uses the same type of activity repeatedly such as the routines of the Morning Meeting, so children know what to do and what is expected of them very well. There is very little spontaneity in her classroom routines.

The fourth gap is between her perception that technology always facilitates instruction and the children's ability to complete the independent assignment using what they worked on during the instruction. Danielle feels that using technology gives children the opportunities to use visual and kinesthetic learning modalities. She also feels that technology use increases the children's level of excitement for learning. However, she doesn't want the technology to be the only thing the children take away from the lesson. She believes technology itself can sometimes

take away from the content of the lesson because the children get too caught up in what the computer can do and lose track of the learning objective for the lesson. She wants the children to keep their excitement for using the technology, but be sure it is balanced it with their excitement for learning the lesson. Because of her strict control of the children's behavior and the strict control on what they do during an assignment, Danielle very seldom has children who cannot complete the assignment. However, the children don't really do the work independently because she monitors what they do for every step of it. The children are not really given the chance to not follow the directions.

The fifth gap is between her perception of her accountability for using technology in her instruction and the Principal's expectation for the teachers' use of technology. When Danielle was asked about teacher accountability, she said that the Principal has made inquires about how things are going with using technology in her classroom. However, she has talked with the Principal about the problems she has had getting the equipment from the technology grant set up the way she wants it done. She feels the Principal feels the same way she does about the frustration and disappointment of not having the equipment the way she was told it would be.

The Principal has said that she feels she has made it clear to the teachers that they are expected to be using the technology in their instruction with the children. She wants to see the teachers using the smart boards to engage and motivate the children. But she also wants the teachers to let go of some of the more traditional ways of teaching and involving the teachers in using technology is one way to do that.

The last gap is between her perception of the support that is available for teachers to use technology and the support that has not been accessed. Danielle feels that all the Kindergarten teachers support each other's use of technology during literacy instruction and exchange ideas

regularly. She also feels that the Principal and the Literacy Coach support the teachers' use of technology. But, she did not mention any other sources of support for the teachers.

The Media Specialist is another source of support for the teachers. She has offered to the teachers her assistance in developing things to use on the smart board. She also works with the teachers' requests to buy things for use with the technology in the classroom when there is money available. Danielle is aware of some sources of support for her use of the smart board, however she has not made use of all the sources of support that are available to her.

Within-case Findings: Antoinette

Who is Antoinette?

Antoinette is a new teacher. This is her second year of teaching. She has only taught at the Kindergarten level. She moved to Georgia after receiving her education degree. She is single, in her mid-twenties and has an infant daughter.

Antoinette describes her teaching style as hands-on. She teaches the children in her class through examples. She does not allow the children to have much down time because she feels that tends to lead to behavior problems. She also feels that like her children, she is still learning. She believes in discipline but tends to be laid back about it because she says she knows these children and understands the background they come from.

Antoinette defines literacy as the ability to communicate orally and in writing, and decode information. She believes that a literate person can derive and convey meaning through the use of their knowledge in order to achieve a purpose or goal requiring the use of spoken or written language skills. In broad terms, she describes literacy as the ability to make and communicate meaning through the use of a variety of socially contextual symbols.

Antoinette believes reading instruction must be authentic. Her main goal in literacy instruction is to provide authentic, open-ended, targeted instruction. Her students receive instruction in phonemic awareness, decoding strategies, comprehension strategies, and the writing process. She embraces the use of quality children's literature to guide students to develop an appreciation for literature. Phonics, word attack skills, vocabulary development, point of view, story retelling, elements of the story, and various strategies are taught as they are embedded within the literature that is used. She tries to make her instruction fluid and flexible to support sound reading instruction practices. She feels that her teaching approach allows her students to actively participate in the reading and writing processes, helps them respond to literature critically and creatively, encourages them to think beyond printed text, and encourages them to become independent readers by using strategies flexibly and independently.

Self-Rating on Computer Technology Use

On the first questionnaire, Antoinette rated herself on her use of computers in several aspects: (a) her general use of computer technology, (b) her use of computer technology in her teaching in general, (c) her use of computer technology in her literacy instruction, and (d) the frequency of her computer use during literacy instruction.

General Use of Computer

She describes herself as advanced as a computer user. She uses the computer on a daily basis either as a teaching tool or as a teaching resource. She states that she has lots of knowledge about the various computer programs that are installed on her laptop as well as other programs (see Figure 4.25).

Figure 4.25. Antoinette's general use of computer technology scale.

Computer Use in Teaching in General

She describes her use of computer technologies in her teaching in general as midway between average and advanced. She uses computer technology in her classroom everyday. With the addition of the smart board to her classroom, she feels she is able to use it more often for hands-on learning during the school day (see Figure 4.26).

Figure 4.26. Antoinette's use of computer technology in teaching in general scale.

Computer Use in Literacy Instruction

For her use of computer technologies during her literacy instruction, she describes herself as average. She uses it for literacy instruction a basic level. She does not use it as a teaching tool to teach a new concept, she uses it as a resource to enhance learning (see Figure 4.27).

Figure 4.27. Antoinette's use of computer technology in literacy instruction scale.

Frequency of Computer Use during Literacy Instruction

Frequency of computer use was defined at three levels: (a) Occasional Use, (b) Moderate Use, and (c) Frequent Use. These levels of use were given as guidelines for the teachers to use as they rated their frequency of use. She describes the frequency of her computer use during literacy instruction as slightly more than Moderate (see Figure 4.28).

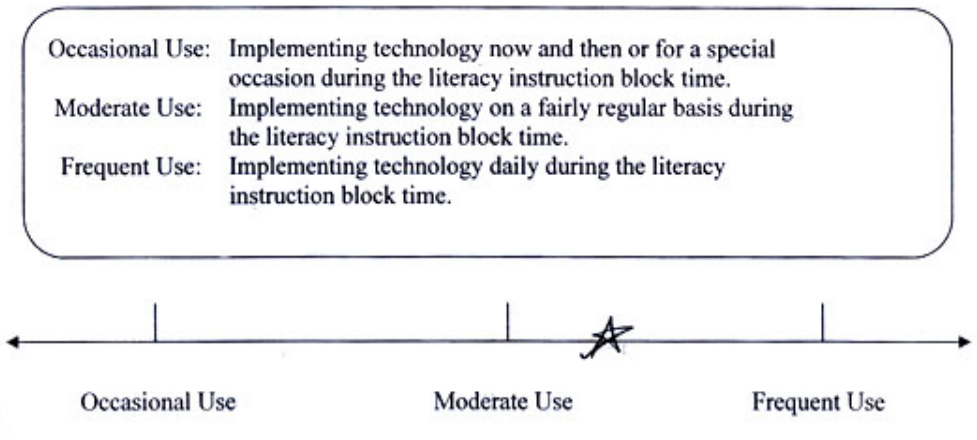

Figure 4.28. Antoinette's frequency of computer technology use during literacy instruction.

Research Questions

In this section I look at my research questions for Antoinette. I begin by looking at the first question: What perceptions do teachers have about using technology during literacy instruction in early childhood classrooms? I conclude by looking at the remaining three questions: (a) What technology are teachers using to facilitate literacy instruction in early childhood classrooms? (b) What modes of meaning making are being supported through the use of technology during literacy instruction? and (c) What new literacies are being used during literacy instruction? as I describe the Antoinette's use of computer technology for the literacy instruction block during the classroom observation visits.

Perceptions About Using Technology

Antoinette feels that technology is a teaching tool that can be an effective enhancement to what is already in place in her classroom. She uses technology as a fun way to get her children actively involved in learning and the learning process. She thinks that using technology effectively can provide her children learning experiences like no other by engaging them as active participants in what they are doing. She is a firm believer that technology can be used in teaching all subjects and at all grade levels.

She feels that using technology fits with her teaching philosophy because it enhances her instruction. The positive aspect of using computers is that it acts as motivation for the children. The children get excited about using the smart board and computer. Because a lot of the technology that she uses is new to the children, she feels they become more active listeners and more engaged in learning. It gets them excited about learning to read and write.

She also feels that using technology makes a teacher's life a little easier because there is less writing required. She can type her mini-lessons and charts instead of writing them by hand. She believes that using technology in this way can act as a good model for the children to see exactly how the letters are formed.

She believes that computers play a big role in the learning environment of the classroom. Computers are used to work toward meeting the standards-based curriculum goals. She uses computers to help the children learn the required skills of the English Language Arts standards. She feels that children need to be exposed to technology as early as possible considering that this is the age of technology and basically everything is technology-based. She would like to see children exposed to it in Pre-Kindergarten or sooner because the more you are exposed to technology the better you are with it. Her children are constantly exposed to technology. She uses computers in literacy as well as the other subject areas of the curriculum.

Technology Used, Modes of Meaning Making, and New Literacies

The literacy block in the Kindergarten classrooms is divided into four learning episodes: (a) Morning Meeting, (b) Reader's Workshop, (c) Writer's Workshop, and (d) Second Daily Dose of Reading Skills Block. The teachers follow an English Language Arts framework of performance standards for reading and writing when they are planning their literacy instruction. The reading performance standards are divided into six areas: (a) Concepts of Print, (b) Phonics,

(c) Phonological Awareness, (d) Vocabulary, (e) Fluency, and (f) Comprehension. There is one performance standard for writing. Appendix V shows the English Language Arts Framework for Kindergarten.

Antoinette was observed using the smart board, her laptop, and Internet websites to engage the children in activities during Morning Meeting, Reader's Workshop, Writer's Workshop, and the Second Daily Dose of Reading Skills Block episodes. She also used the smart board for classroom management short transition times when the class finished early and there were a few minutes before going on to the next learning episode or before the class went out for recess or to one of their special classes: Art, Music, Library, or Physical Education.

Morning meeting.

Antoinette began the school day having the children come to the classroom mat for the daily Morning Meeting. During this meeting, she used the smart board to work on several daily classroom routines.

The Morning Meeting began with reading the morning message. Antoinette created the daily morning message on her laptop computer. She displayed the message on the smart board. She had the children read the message as a group while she tracked the print on the screen with her hand (see Figure 4.29).

The morning message activity worked on two areas of the Reading framework. It worked on Concepts of Print by giving the children an opportunity to recognize that print can inform, to understand that print has meaning and represents spoken language in written form, and to track text from left to right and top to bottom. It also worked on Fluency by giving the children an opportunity to practice reading orally with accuracy and expression.

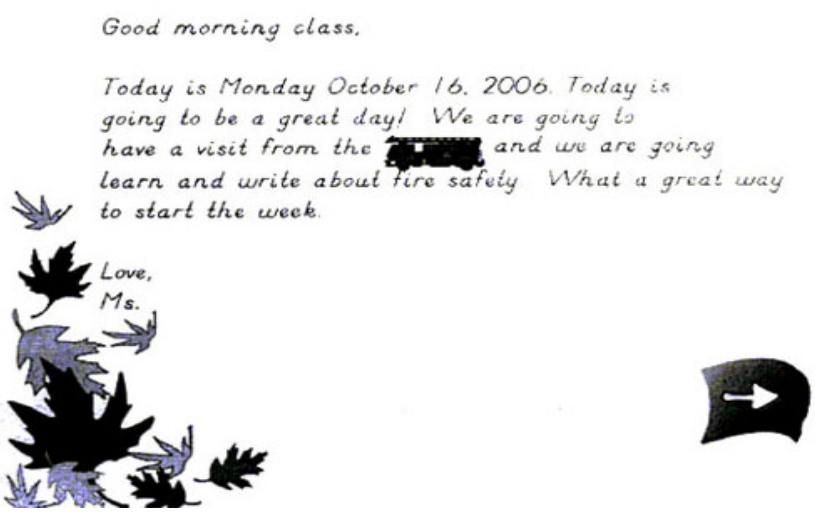

Figure 4.29. Morning message.

This activity involved one mode of meaning making. It used the print mode to display the typed message on the screen.

This activity did not incorporate any new literacies. The children did not interact with the smart board screen. The smart board was used in a traditional way as chart paper with the Morning Message printed on it.

The next classroom routine was calendar time. This routine consisted of three parts. Antoinette displayed the monthly calendar in which she had inserted symbols and text to let the children know what would be happening during the month. She directed the children's attention to the calendar. She asked what month it was. She selected a child to come to the screen and point to the month word. Then she asked the children what day of the week it was. She had a child come to the calendar and point to the day of the week word. Then she asked what the number for the day was. She had a child come to the calendar and point to the day's square, and read the number in it. Next she asked the children what year it was. She had a child come to the calendar and point to the year. Finally, she had the entire class say the complete date as she pointed to the day of the week, the month, the number of the day, and the year (see Figure 4.30).

The second part of calendar time involved the days of the week. Antoinette used the smart board to display a list of the days of the week. First, she had the children read the days in order. Next she had them practice reading the days as she pointed to them randomly. Finally, she called on individual children to read the day she pointed to on the screen (see Figure 4.31).

The third part of calendar time involved the months of the year. Antoinette used the smart board to display a list of the months of the year. She placed a symbol next to the current month word to indicate what month it was. First, she pointed to the word beside the symbol and had the children read the word with her. Next, she had the children read the months in the correct order. Next she had them read the month words as she randomly pointed to them. Finally, she called on individual children to read the month word that she pointed to on the screen (see Figure 4.32).

Figure 4.30. Monthly calendar.

Figure 4.31. Days of the week chart

Figure 4.32. Months of the year chart.

Calendar time worked on one area of the Reading framework. It worked on Concepts of Print by having the children recognize that print and pictures on the monthly calendar have meaning and can give them information and by working on the left-to-right pattern used in each

week on the calendar. Learning the days of the week words and the months of the year words reinforces that labels are used to give them information.

The third routine worked on the season of the year. Antoinette created a seasonal chart and added a sentence on it. She displayed the chart on the smart board (see Figure 4.33).

She asked the children to tell her what season it was. Then she had the children read the season sentence with her. She pointed to the word *Fall* on the chart. Next she asked the children to tell what they knew about the season. She gave them the opportunity to talk about activities they liked to do during the fall season.

Figure 4.33. Season chart

The fourth classroom routine worked on the weather chart. Antoinette created a weather chart incorporating the same background as the season chart. The weather chart had a sentence beginning at the center. It also had five weather word choices listed at the bottom (see Figure 4.34). She displayed the weather chart and called on the weather helper for the day to go to the door at the back of the classroom, look outside, and report what the weather is like outside. This helper found the correct weather word label in a pocket holder on the door and attached it to the outside of the pocket.

Figure 4.34. Weather chart.

Then the child came to the smart board and used one of the electronic pens to circle the weather word that described the weather outside. Antoinette had the child read the weather word was circled. Next she had the children read the sentence on the screen and complete it with the circled weather word.

Transitions

To signal the end of the Morning Meeting, Antoinette used Internet activities, one per day, as a transition to the next learning episode. She displayed a chart on the smart board that gave the URL of the Internet website activity for the day (see Figure 4.35). When the children saw this chart, they knew that they would be doing an activity and got very excited. Antoinette clicked on the navigation button in the right corner to go to the Internet website. She incorporated a series of different educational website, using one each day, at the end of the morning meeting to give the children an opportunity to interact with the Internet activities on the smart board. This was her way to let the children "play" on the screen while using and working on their literacy skills. This fit with her teaching philosophy of being hands-on and gave her a way to get the children actively involved in learning.

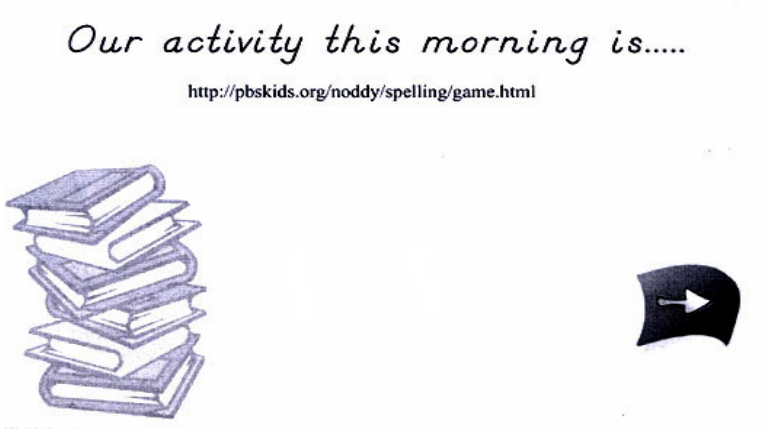

Figure 4.35. Transition activity chart.

The following are some of the website activities she used as transition activities during the classroom observations. The first Internet website visited on one day was Elmo's World Rhyming. This website is found at http://www.pbskids.org/sesame/edlmosworld/index.html. For this activity, Elmo tells the children that he is thinking about rhymes. Elmo opens the closet door and a group of objects fall out onto the floor. Elmo picks out two objects and explains that they rhyme. Then he invites the children to make some rhymes with him. If the children want Elmo to find the rhymes, the children click on Elmo. If the children want to find the rhymes on their own, they click on the closet door. When they click on the closet door, the screen shows two shelves of objects. Elmo tells them to find the object that rhymes with the word he says. When he names the word, a picture for that word appears in a bubble above the goldfish bowl.

There are five pictures on the shelves. Two pictures in the group of objects rhyme with the picture shown. If the children touch an object, Elmo names the object. When the children click on the picture they think rhymes with the picture, Elmo gives them immediate feedback about their choice. If the children click on an incorrect rhyming object, Elmo names the object selected and tells them that object doesn't sound like a rhyme for the picture name and to try

again. If they continue to pick incorrect objects, Elmo gives them clues and tells them to try certain objects. When the children find the correct rhyming pictures, Elmo tells them they are correct and encourages them to find all the objects that rhyme with the picture. When all the rhymes for the picture are found, Elmo gives them two options. He asks the children if they want to share their rhymes with another person or if they want to continue playing the game. If they choose to share with a friend, another screen opens and the children can send an email message to a friend. They fill in the email address information and type a message to their friend. When they click to send the message, they receive a message telling them that Elmo sent their rhymes with care and he's glad they love to share. The other option is to continue to play the game. They click on the arrow that takes them back to the first screen and the game starts again.

This activity worked on the Phonological Awareness area of the Reading framework because it involves oral language. They see pictures of objects and hear Elmo say the picture name but they do not see printed words for the objects shown.

This activity involved three modes of meaning making. It used the graphics mode to show the objects the children would use to rhyme. It used the animation and audio modes for Elmo to explain what the children were to do to play the game and give other directions during the game.

This activity incorporated two of the new literacies: clicking and using touch screen links. The children clicked on the pictures to rhyme with the given word and picture shown. And they used the touch screen link.

Another website she used is *How Do You Feel?* This website is found at http://pbskids. org/rogers/make_believe/feel.htm. This activity reinforces for the children that we all have feelings. It tells them that people can know what we are thinking and feeling when we talk about

our feelings and that our faces help to show how we feel. During this activity, the children have the opportunity to interact on the web page by clicking on the features of the face in the frame to change its expression. Antoinette called on several children to change the eyes, eyebrows, and mouth to create a different face in the frame. Then she asked the children to think of a word to describe how the person in the frame was feeling and why they thought so. She gave the children time to talk about when they had experienced that kind of feeling.

This activity worked on two areas of the Reading framework. It worked on Vocabulary by having the children use their speaking vocabulary to talk about their feelings. It worked on Comprehension by letting the children make connections between the feelings shown and when they might have felt the way the person in the frame feels in their life.

This activity involved only the graphics mode of meaning making. The children used the picture on the screen to talk about their feelings and connect the feeling displayed in the frame with their own life.

This activity incorporated only one of the new literacies: clicking. The children clicked on the eyebrows, eyes, and mouth to change the picture and show a different expression.

Another website she used was *Cookie Monster's Corner*. This website is found at http://pbskids.org/sesame/letter/l.html. In the first activity, Cookie Monster invites the children to play a letter matching game and tells them what they need to do. When the children touch the letter, the computer pronounces the letter sound they are looking for. There are five pictures with the picture words under them on the screen. When the children touch each picture, the computer reads the picture word to them. The children touch and drag the pictures that begin with the same sound as the target letter sound onto Cookie Monster and click on it. If they drag a correct picture onto Cookie Monster and click on it, he eats the picture and burps. If they drag an

incorrect picture onto him, Cookie Monster tells them he cannot eat that cookie and the picture returns to the other pictures on the screen. If the children are having trouble identifying the correct pictures, there is a purple question mark in the bottom right corner of the screen. When children click on the question mark, the pictures starting with the target sound vibrate on the screen as a hint. When all the correct pictures have been found and fed to Cookie Monster, he tells them they are good at playing the cookie game and they can play again. Another letter with different pictures and picture words appears on the screen for the children to continue playing.

Also within this letter activity, the children are given practice matching upper- and lowercase letters on cookies with the letter shown in the top, left corner. The children click and drag the letter cookies onto Cookie Monster. If they drag a correct letter cookie, Cookie Monster eats the cookie, burps, and tells them to find another cookie. If they drag an incorrect letter cookie, Cookie Monster refuses to eat the cookie and tells them to try again. The children receive immediate feedback for their choices and are given help if they need it.

This activity worked on the Phonics area of the Reading framework by having the children practice finding pictures that begin with the letter sound shown in the top, left corner and having the children practice recognizing the upper- and lowercase letters.

This activity involved four modes of meaning making. It used the graphics mode to show the pictures that begin with the identified letter sound. It used the print mode to show the picture words and the upper- and lowercase letters on the cookies. It used the audio and animation modes for Cookie Monster to give the children the directions on how to play the game and feedback while they played.

This activity incorporated three new literacies: clicking, dragging, and using touch screen links. The children clicked on the pictures or the letter cookies to select them. They dragged the

picture or cookie onto Cookie Monster. Then they clicked on Cookie Monster to see if they had selected a correct answer. If they needed help they used the touch screen link to get a hint to help them find the correct answer.

Another website she used is *Spanish Word of the Day*. This website is found at http:// pbskids.org/sesame/word/index.html. At this website, the children are given the opportunity to learn Spanish words. There is a picture scene on the left side of the screen. Beside this picture is a Sesame Street character that pronounces a Spanish word and invites them to find what the Spanish word stands for in the picture. A picture for the Spanish word pronounced is shown above the character's head in a bubble. The children repeated the Spanish word and then found and clicked on the given picture within the picture scene. If the children touch the correct picture, the Sesame Street character gives them positive feedback, sometimes in English and sometimes in Spanish, and pronounces the Spanish word again. Then the character pronounces another Spanish word, shows a picture for the word, and invites the children to play again. The children find and click on the new picture within the picture scene and say the Spanish word again. If they click on an incorrect picture, the character simply says "no" and they can click on something else in the picture scene. As they continue through the activity, when all the objects in a picture scene have been clicked on correctly the scene changes and different Spanish words are pronounced for them to find.

This activity worked on the Vocabulary area of the Reading framework. The children were given the opportunity to learn vocabulary words in Spanish and connect the Spanish words with their English vocabulary words. Antoinette's class has several children who speak Spanish as their first language. This activity gave them a chance to work on building connections between the Spanish words and the English words for the objects shown.

This activity involved three modes of meaning making. It used the audio and animation modes to have the Sesame Street character pronounce the Spanish word for the children. It used the graphics mode to illustrate the Spanish word given for them to connect with the given word.

This activity incorporated only one of the new literacies: clicking. The children clicked on the picture for the Spanish word in the picture scene and received feedback about their choice.

Another website she used worked with the alphabet. This website is found at http://www.abcya.com/alphabet.htm. The children are told by the computer voice that something has happened to the alphabet and it's not in the correct order. They are asked to help put the alphabet back into correct order. They click and drag the alphabet letters into the boxes to get them in the correct order. When all the letters are in the boxes, they click on the checkmark at the bottom right corner to check and see if they have the letters in the correct order. The alphabet letter that should be in each box is shown above the box and the children can check their work.

This activity worked on the Phonics area of the Reading framework by having the children work on recognizing the letters of the alphabet and putting the letters into alphabetical order.

This activity involved two modes of meaning making. It used the print mode to display the letters of the alphabet the children would work with. It used the audio mode to tell the children what happened and ask them to help put the letters back in correct order.

This activity incorporated three new literacies: clicking, dragging, and navigating on the screen. The children clicked on the letter to select it. Then they dragged the chosen letter to the correct box. To participate in this activity the children were required to navigate the letters across the screen to the correct box.

Another website she used was Elmo's World Weather. This website is found at http://www.sesameworkshop.org/sesamestreet/elmosworld/games.php?contentId=12270546. For this activity, Elmo tells the children that today he is thinking about the weather. Elmo wants to go outside to play but he needs to know what kind of clothes to put on. He can't get dressed until he knows what the weather is like outside. He tells the children he wants them to choose a type of weather from the four weather symbols given. When the children touch one of the weather symbols the computer voice names it. When a weather symbol is clicked on, the background of the picture changes to that type of weather. Elmo describes the weather that the background shows. He asks the children to help him decide what clothes to wear when he goes outside. There are different types of clothes to choose from. When the children touch one of the clothing choices, Elmo names the clothing pieces. The children click on the clothes for Elmo to wear. If they choose the correct clothes, Elmo gives them positive feedback by describing the clothes that were selected and thanks them for helping him. Then he tells them to choose a different kind of weather. If they choose inappropriate clothing, Elmo talks about the clothing they selected and why the clothes are not correct. He tells them to try again to find the correct clothing for the weather in the picture.

This activity worked on the Comprehension area of the Reading framework because it allows the children to use their prior knowledge and the graphic features on the screen to do some problem solving.

This activity involved three modes of meaning making. It used the graphics mode to show the weather symbols, the weather backgrounds, and the different clothing choices. It used the audio and animation modes to have Elmo give the children the directions for doing the activity and giving them feedback about their selected responses.

This activity incorporated only one of the new literacies: clicking. The children click on the weather symbol to select the type of weather. Then they click on the clothing they think Elmo should wear for the selected weather.

Another website she used is *Dora the Explorer: Swiper's Spelling Book Game*. This website is found at http://www.nickjr.com/shows/dora/index.html. Clicking on the "playtime" link opens the introduction screen where Dora asks the children if they are ready to play. This screen links to a map and by clicking on the games icon, the children can scroll through the different game choices to find *Swiper's Spelling Book Game*. In this activity, the children are shown a picture on one page of the spelling book. On the facing page, they are shown the picture word spelled out. Dora names the letters and then says the word. Suddenly Swiper, a masked fox, jumps out on the screen and takes all the letters off the word page. He tells the children that they'll never find it now. The screen shows the picture, but on the facing page are blank lines. There are enough lines needed to spell the picture word. Five letters appear above the spelling book. Dora asks the children to click on letters to spell the word. Antoinette had a child click on the beginning letter for the word. The computer named the letter that was clicked on. If the letter chosen was correct, the letter appeared on the blank line on the spelling book page. If the wrong letter was clicked on, Dora told the children to try another one. Antoinette had another child click on the letter for the middle sound. Then she had another child click on the last letter for the final sound in the word. When the word was finished correctly, Dora named the letters to spell the word and then read the word again.

This activity worked on the Phonics area of the Reading framework by giving the children opportunities to practice sounding out words with the consonant-vowel-consonant pattern and then spelling the words.

This activity involved four modes of meaning making. It used the animation and audio modes for Dora to give the introduction to her games and the directions for playing this game and also for Swiper to take the letters and tell the children they would never find the word now. It used the graphics mode to show the pictures in the spelling book. It used the print mode to show the letters the children use to spell the picture word.

This activity incorporated only one of the new literacies: clicking. The children click on the letters to spell the picture word.

Another website she used is *Spell 'n Pop*. This website is found at http://pbskids.org/noddy/spelling/game.html. At this website, Big Ears the elf, asks the children to help spell some words by popping the correct balloons. There are three levels available to practice spelling words. In Level 1, the children are shown a picture. Next to the picture is the picture word with the beginning letter highlighted by a rectangle. Above the picture and picture word are balloons with letters on them. The children are asked to match the beginning letter for the picture word with a letter on a balloon. They click on the balloon. If they click on an incorrect balloon, the balloon deflates and flies away. Big Ears gives different kinds of printed feedback on the screen to tell the children to try again each time an incorrect letter balloon is chosen. If the children make a correct choice, the balloon pops and the letter appears in the rectangle. Big Ears gives correct choices printed feedback telling the children they are doing well. When a word is correctly completed a button saying "carry on" flashes on the screen. When the children click on this button, a new picture and word with a beginning letter in the rectangle for them to match appears on the screen. There is an area under the elf on the screen that keeps track of how many words the children have correctly found and popped the balloons. When they have completed six words correctly, they have two buttons to choose from. One button lets them choose a different

level of the game to try. The other button lets them play the game at the same level again. If they choose to play at the same level again, different pictures and words are used to match the beginning letter of the picture word. If they choose to try a different level, the next level involves matching the letters to spell complete words for the picture shown. The third level involves the children in spelling the picture word on their own. They are given blank lines to show how many letters are in the word and they must spell the word by choosing the correct balloons to fill in the lines.

This activity worked on the Phonics area of the Reading framework by giving the children to practice matching the letter for the beginning sound of a word in Level 1. They continue working on Phonics by matching the letters to spell the beginning, middle, and ending sounds of a word in Level 2. And in Level 3, they work on Phonics by sounding out the word and spelling it.

This activity involved two modes of meaning making. It used the print mode to show the letters on the balloons, for giving the directions on how to play the game, and for giving feedback about the children's answers. It used the graphics mode for the letter balloons, for the word picture, and to show Big Ears who gave the directions and feedback to the children.

This activity incorporated only one of the new literacies: clicking. The children clicked on the letter balloons to match the letters in the words and to spell the picture word on their own.

Classroom management transitions.

Antoinette also used technology for short transition times when the class finished their work a few minutes early. She used technology to provide a brief activity before going on to the next episode, going out for recess, or going to one of their scheduled special classes. The following are activities she used during a short transition time.

The first website is *Word Play*. This website is found at http://pbskids.org/ lions/games/ wordplay.html. For this activity, children watch animations of words acting out their meanings. When a child clicks on a word, the computer pronounces the word and goes to a screen showing the word. Then an animation enhanced with sound effects shows the meaning for the word. There are twenty-five words divided onto three screens. Antoinette named a word shown on the screen and called on children to see if they could find that word. The children went to the screen and clicked on the word they thought she said. The children got immediate feedback to see if they found the correct word when the computer said the word and the animation played.

This activity worked on the Vocabulary area of the Reading framework because it allowed the children to experience what words mean and then talking about the words.

This activity involved three modes of meaning making. It used the print mode to display the words the children could choose to see its meaning. It used the audio and animation modes when illustrating the meaning of each word.

This activity incorporated only one of the new literacies: clicking. The children clicked on a word to select it. The computer pronounced the word and showed the animation showing what the word means.

Another activity she used for a short transition is *Boohbah*. This website is found at http://pbskids.org/boohbah/lwicd.html. For this activity, there are seven different action symbols in circles that can be used to create a pattern. Antoinette created a pattern by clicking on the symbols. The symbols appeared in the row of boxes at the bottom of the screen. When all the boxes were filled, she clicked on the green triangle. The character on the screen performed each of the actions in the pattern. The children followed the actions of the character and performed the actions they saw on the screen. Antoinette could change the appearance of the character by

choosing different color hairstyles, different face colors, and different eyes. By clicking on the eraser, she erased the pattern in the boxes and created a new pattern. She continued making patterns as long as there was time. Sometimes she asked the children to suggest the next action to continue a pattern that she had started. At other times she had children choose the action symbols to create a pattern she gave them based on one of the patterns the class had worked on such as an AB pattern, an ABB pattern, an AAB pattern, or an ABC pattern.

This activity worked on the Concepts of Print area of the Reading framework by reinforcing tracking from left to right and. Another way she used this activity was as a classroom management technique because this activity allowed the children an opportunity to move around when they became restless to get their wiggles out before going on to a new learning activity.

This activity involved three modes of meaning making. It used the graphics mode to show the different actions that could be used to make up the pattern of movements. It used the animation and gestural modes to have the children move their bodies to follow the motions the character on the screen performed.

This activity incorporated only one of the new literacies: clicking. The teacher clicked on the different actions to create a pattern. Then she clicked on the green triangle to start the animation showing the pattern of actions she had created.

Another activity that she used for a short transition time was a video, *How the Alphabet Got Its Order!* This video is found at http://www.starfall.com/n/level-a/learn-to-read/load.htm?f. To access the video, click on the ticket link for the alphabet movie. The video worked with the sounds of the letters and putting the alphabet in order.

This activity worked on the Phonics area of the Reading framework by reinforcing the names and sounds of the letters of the alphabet. The letters make the letter sound as they appear in the video and then are put into alphabetical order.

This activity involved three modes of meaning making. It used audio mode to make the letter sounds and explain putting the letters into alphabetical order. It used print mode to show the lowercase letters. Consonant letters were in black print. Vowels were shown in different colors. It used the animation mode to show the letters getting into alphabetical order and to keep the children's attention.

This video did not incorporate any of the new literacies. The children did not interact with this website on the smart board. The smart board was used in a more traditional way as a video player.

When she needed a short transition activity on a Friday, she brought up the Friday Dance chart on the smart board. This was a chart Antoinette made. When she clicked on the characters on the screen, they did an animated dance (see Figure 4.36).

This activity was intended as strictly a fun activity for the class. It gave the children the opportunity to dance and get their wiggles out.

Figure 4.36. Friday dance chart.

This activity incorporates only one of the new literacies: clicking. The teacher clicked on the characters to start their animated dance and to signal to the children to start dancing

Reader's workshop.

Antoinette created a daily Reader's Workshop chart. At the beginning of Reader's Workshop time, she displayed the chart on the smart board. The chart included the agenda for Reader's Workshop including what the mini-lesson was about, what the class would do during work time, and who would be sharing with the class (see Figure 4.37).

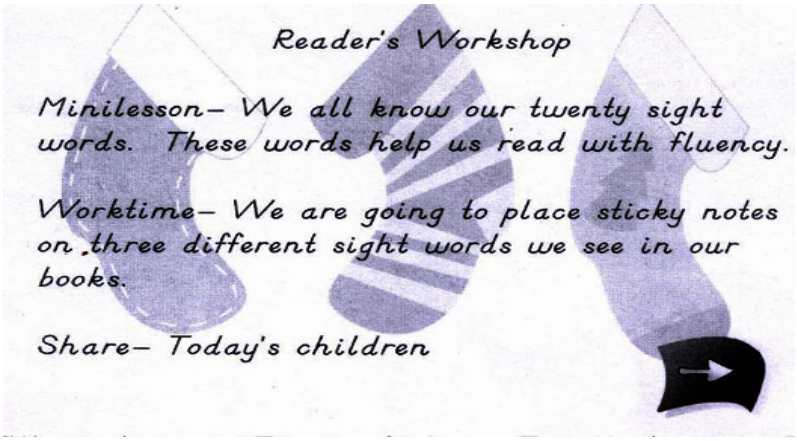

Figure 4.37. Reader's Workshop chart.

This use of technology involved one mode of meaning making. It used the print mode to show the typed chart for Reader's Workshop that day.

This use of technology did not use any of the new literacies. It used the smart board in a traditional way as chart paper.

Another way Antoinette used the smart board during Reader's Workshop was to demonstrate what the children would be working on for their independent assignment. One day she read the nursery rhyme, *Peter, Peter, Pumpkin Eater* (see Figure 4.38). She talked with the children about how everyone has someone who is special to them and how Peter put someone who was special to him in a pumpkin shell to keep her safe.

She encouraged the children to talk about someone who was special for them. Then she demonstrated what they would do on their paper for the assignment. She brought up a blank screen on the smart board. She drew a pumpkin shell on the screen and added a rectangular window. She drew a picture of someone who was special to her in the window. Next she wrote a sentence under the window telling who she put in the pumpkin shell and why. Her sentence was about Aiden and why she put Aiden in the pumpkin shell. She had the children help her spell some of the words in her sentence by sounding out the words and used “kid spelling”. When she is finished the demonstration, Antoinette reviewed the directions for the assignment step by step. She gave each child a sheet of paper with a pumpkin shell on it. Antoinette expected the children to draw the picture of the person they would put in their pumpkin shell to keep them safe first. Then they were to write their sentence telling whom they drew and why they put that person in the pumpkin shell. She encouraged the children to write their sentence on their own by sounding out the words and using “kid spelling” for any words they didn’t know how to spell.

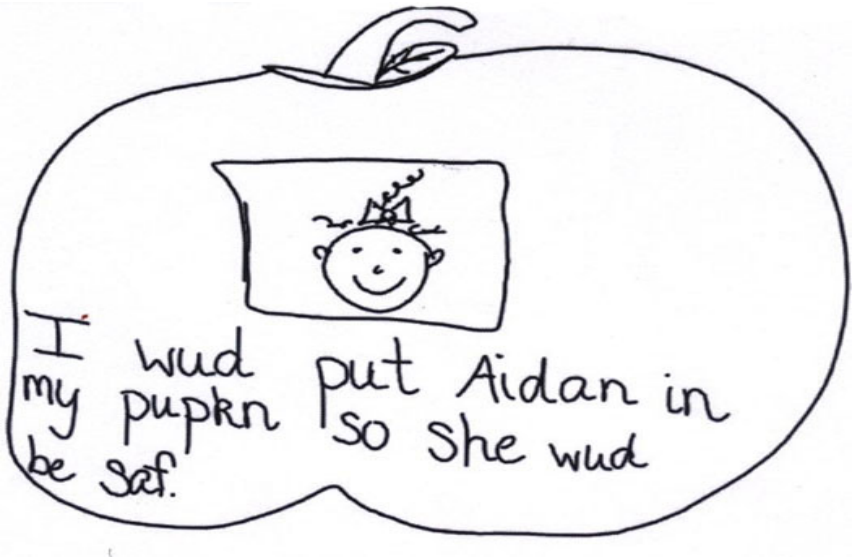

Figure 4.38. Who is special to you? demonstration example.

This activity worked on the Writing framework by having the children write about a familiar person, use phonetically spelled words to create their meaning, use a left-to-right pattern of writing in their sentence, and practice using capitalization at the beginning and punctuation at the end of the sentence.

This activity involved two modes of meaning making. It used the graphics mode to show the picture drawn by the teacher on the top half of the screen. It used the print mode to show the sentence written under the picture.

This activity incorporated only one of the new literacies: screen writing. The teacher used the electronic pen to draw her picture and then write the sentence about the picture on the screen.

Writer's workshop.

Antoinette used the smart board everyday during Writer's Workshop. She created a daily Writer's Workshop chart and displayed it on the smart board. The chart included the agenda for Writer's Workshop including what the mini-lesson for the day was about, what the class would do during work time, and who would be sharing today (see Figure 4.39).

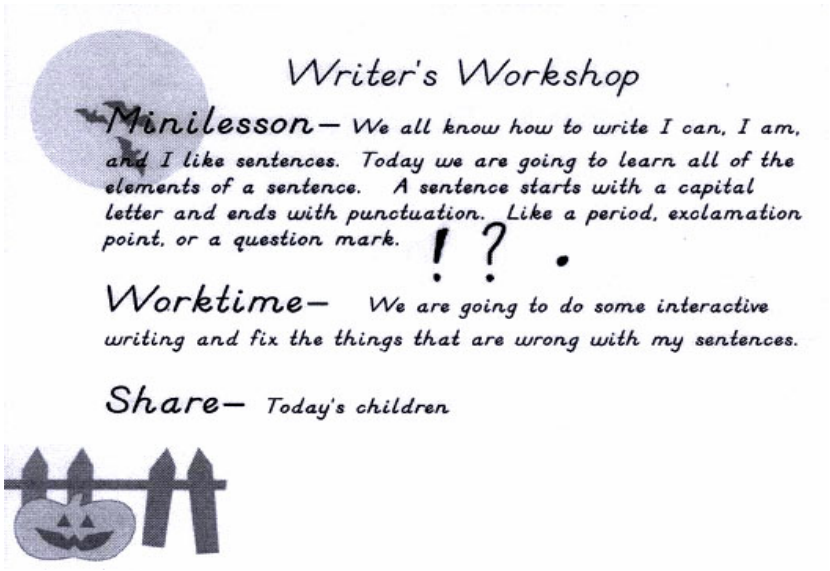

Figure 4.39. Writer's Workshop chart.

This use of technology involved one mode of meaning making. It used the print mode to show the typed chart for Writer's Workshop that day.

This use of technology did not use any of the new literacies. It used the smart board in a traditional way as chart paper.

Another way Antoinette used the smart board during Writer's Workshop was to demonstrate for the children what they would be doing for their independent assignment (see Figure 4.40). One day she began the lesson by displaying a chart on the smart board showing six steps good writers use when they write. She read each step with the children.

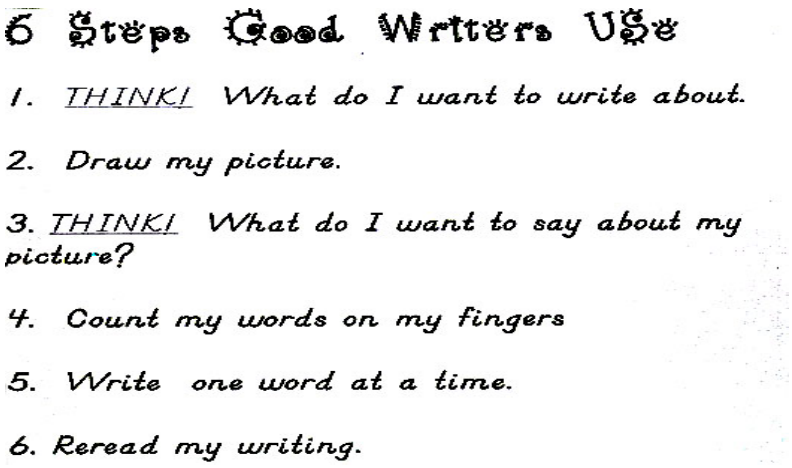

Figure 4.40. Good writer's chart.

Then she modeled each step. First, she did a think-aloud about what she wanted to write about. Second, she brought up a blank screen on the smart board, made a line across the board, and drew a picture of what she decided to write about above the line. Third, she did a think-aloud about what she wanted to say about her picture. Fourth, she said the sentence she wanted to write, counted the words on her fingers, and drew a line for each word on the smart board below her picture. Fifth, she wrote her sentence, one word at a time, on the lines. For the last step, she reread what she had written.

She told the children they would follow the steps on the good writer chart when they did their writing assignment. She read through each of the steps on the chart again. She showed the children the paper they would use. The assignment paper had a blank area on the top half and writing lines on the bottom half. She gave each child a piece of the paper and they began working on the assignment. She reminded the children to think about what they want to write about before they start drawing the picture. She also told them to use "kid spelling" when they wrote their sentence. She displayed the good writer chart on the smart board during work time so the children could refer to it as they worked. Antoinette monitored their work and made sure they followed the steps on the good writer's chart (see Figure 4.41).

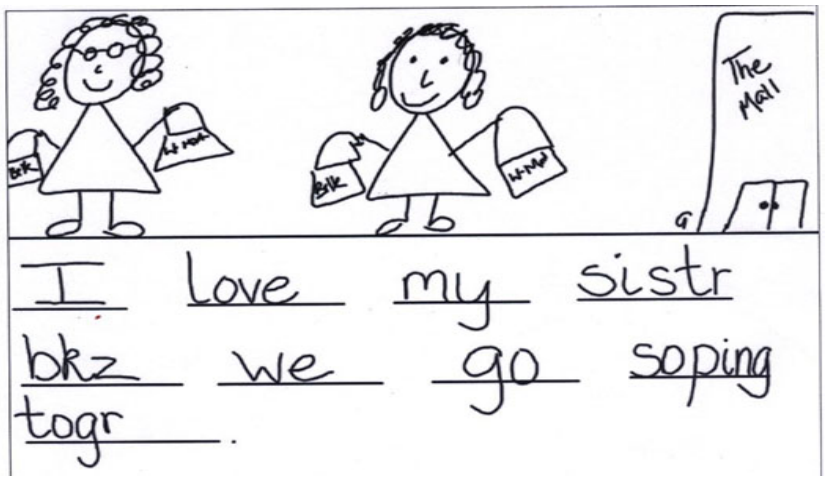

Figure 4.41. Writing Workshop demonstration example.

This activity worked on the Writing framework by having the children write about a familiar person, by using phonetically spelled words to create meaning, to use the left-to-right pattern of writing, and having the children practice using capital letters at the beginning and punctuation marks at the end of their sentence.

This activity involved two modes of meaning making. It used the graphics mode when the teacher drew her picture. It used the print mode when she wrote her sentence on the lines under her picture.

This activity incorporated only one of the new literacies: screen writing. The teacher used the electronic pen to draw her picture. Then she used the pen to make a line for each word in her sentence and then write her sentence on the lines.

Second Daily Dose of Reading Skills Block.

One example of an activity Antoinette used during the Second Daily Dose of Reading Skills Block reviewed and reinforced using correct capitalization and punctuation in sentences. (see Figure 4.42). Antoinette brought up five sentences on the smart board. She had the children read the first sentence. She asked them if they saw a mistake in the first sentence. As a prompt, she asked how a sentence begins. She called on a child to come up to the smart board and point to the mistake in the sentence and correct it. The child used an electronic pen to write a capital letter at the beginning of the sentence to correct the sentence on the smart board. Antoinette asked the children to tell her what comes at the end of this sentence. She called on a child to circle the period at the end of the first sentence. The child used the electronic pen to circle the period at the end of the sentence. She followed the same procedure to have the children find and correct the mistakes in each sentence and then circle the punctuation mark at the end.

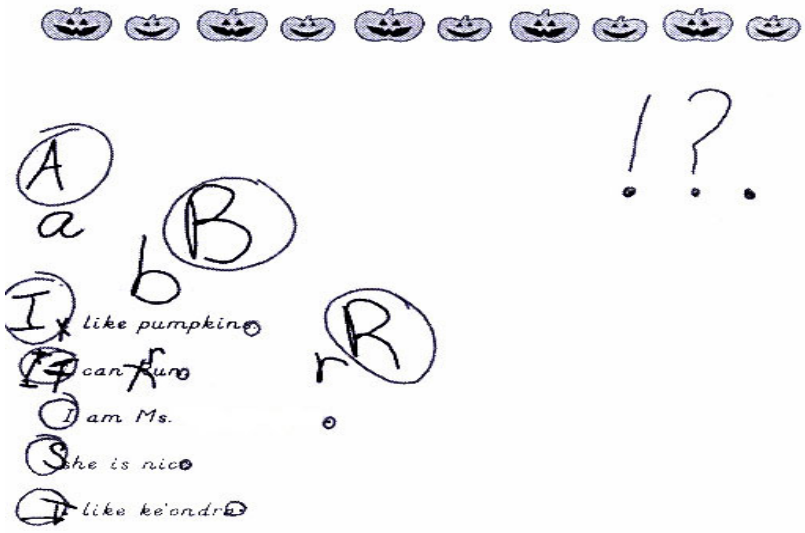

Figure 4.42. Correcting sentences lesson.

This activity worked on the Writing framework by having the children find and correct the mistakes in sentences. It reinforced using capital letters at the beginning of a sentence and punctuation marks at the end of the sentence.

This activity involved one mode of meaning making. It used the print mode to show the typed sentences that had mistakes in them.

This activity incorporated only one of the new literacies: screen writing. The children used the electronic pen to correct the mistake in each sentence and then circle the punctuation mark at the end of each one.

Another example of an activity Antoinette used during the Second Daily Dose of Reading Skills Block involved a poem and singing the words of the poem as a song. The children would recite the poem and then sing the song for another Kindergarten class for a Reader's Theatre presentation. She displayed the poem, *Today It Is Raining*, on the smart board. She began by having the children practice reading the poem. Then she asked the children to name the words in the poem that started with the /r/ sound. When a child named a word starting with the /r/ sound, she told the child to underline the word on the screen. Then she had the children find the punctuation marks in the poem. She called on children to circle the punctuation marks on the screen. Next she erased the markings on the screen and had the children practice reading the poem again. Finally, she told the children they would be singing the words of the poem as a song during their presentation. She played a song file and the children practiced singing the words of the poem along with the music.

This activity worked on three areas of the Reading framework and the Writing framework. It worked on Concepts of Print by having the children track the text from left to right and top to bottom as they read the poem. It worked on Phonics by having the children name and

underline the /r/ words. And it worked on Fluency by having the children practice reading the poem smoothly and accurately. It also worked on Writing by having the children recognize the different punctuation marks used at the end of the sentences in the poem and circle them.

This activity involved only one mode of meaning making. It used the print mode to show the typed poem on the screen that the children read, sang, and interacted with.

This activity incorporated only one of the new literacies: screen writing. The children used the electronic pen to underline the /r/ sound words in the poem, write the correction for the mistake in the sentence, and circle the punctuation marks.

Summary of Findings: Antoinette

The purpose of my study was to investigate teachers' perceptions and practices on using computer technology to facilitate literacy instruction in early childhood classrooms. My within-case analysis looked at the alignment of Antoinette's perception and practice on using technology.

Anotinette uses a socio-cognitive approach to her teaching. She encourages her children to talk and help each other, and be very actively involved in learning. She views her role as the teacher as a facilitator of learning and teachers by examples.

Antoinette's smart board is the focal point of the room. It is installed in the front of the classroom where she has the children gather for whole group instruction. This location allows the children to actively participate and interact with each other during whole group time. Antoinette organizes her classroom in a very open way where one area blends into another. The tables are located in the center of the classroom. No matter where the children are in the classroom, they are able to see the smart board (see Figure 4.43).

Antoinette's use of the smart board is very planned. She carefully preplanned the transition activity for each day at the end of the morning meeting. She used the smart board in all of the literacy learning episodes. Sometimes within a single learning episode she used the smart board in both a traditional way as a chart or chart paper and involving new literacies. She skillfully wove the use of the smart board into her lessons. Antoinette's use of the smart board would fall within Reality 2 on the Multiple Realities continuum.

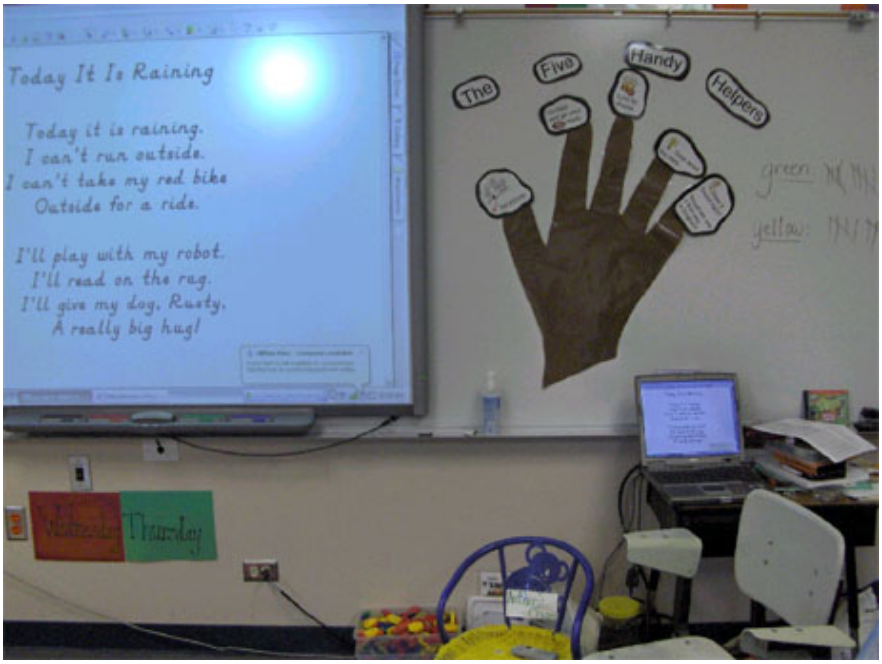

Figure 4.43. Antoinette's smart board in her classroom.

While doing the within-case analysis of the data about Antoinette several gaps (misalignments) appeared between her perceptions about using technology and her practices during her literacy lessons (see Figure 4.44).

The first gap is between her perception of technology that is available and technology that is not used. Antoinette has computer technology available in her classroom. She has a smart board, a teacher laptop, and a desktop computer dedicated for children's use. She uses her laptop computer and the smart board often, but there are lessons that she works on with the children that

she could use this technology for, but does not. For example, for the Reader's Theatre activity with the *Today It Is Raining* poem, she used the smart board to display the poem and to play the music for the children to sing the words of the poem in her own classroom. However, even though the Kindergarten room where her class was to present the poem had the same computer technology, she chose to use a poster board chart of the poem when they performed it. She could have used the smart board in the other classroom to display the poem but did not make use of the available technology. She also has a desktop computer that is dedicated for use by the children. Even though some of the Internet website activities that she had used on the smart board could be used on this desktop computer by the children independently this computer was not used at all. This computer was placed on a counter in the back of the classroom with things piled around it and was not used by the children.

Antoinette: Within-case Gaps between Perception and Practice

Perceptions	Practices
Technology available	Technology not used
Amount of time she thinks she uses technology	Amount of time technology is actually used
Technology is always engaging for the children	Children's engagement
Technology always facilitates instruction	Children's ability to complete independent assignment
Perception about training available	Training she took
Accountability for using technology in instruction	Accountability expectations for use by the principal
Perception about support available	Support not accessed

Figure 4.44. Gaps between Antoinette's perceptions and practices.

The second gap is between her perceptions about the amount of time she thinks she uses technology and the actual amount of time technology was used during the literacy instruction block. Antoinette rated her frequency of computer technology use during literacy instruction as between Moderate and Frequent. Moderate use was defined on the first questionnaire as implementing computer technology on a fairly regular basis. When I went over the questionnaire with the teachers before they rated their frequency of use, I told them to use two to three times a week as a guideline for Moderate use. Frequent use was defined as implementing computer technology daily. During the time period that I observed in Antoinette's classroom, she used the smart board during 13 of the 13 observation visits or 100% of the observations. During 2 of the 13 observations (15%), she used the smart board for a lesson or activity in a single learning episode of the literacy instruction block. During 11 of the 13 observations (84%), she used the smart board for lessons or activities in multiple learning episodes. In 4 of the 13 observations (30%) she used the smart board during all four learning episodes.

She was asked what percentage of time she used technology in her literacy instruction during the second interview. She felt she used technology about 55% of the time. The literacy instruction block consists of four scheduled learning episodes: the Morning Meeting, Reader's Workshop, Writer's Workshop, and the Second Daily Dose of Reading Skills Block. There were 52 literacy-learning episodes over the period of the scheduled observations. Looking at the number of learning episodes during the literacy instruction block in which she used technology in her instruction or involved the children in literacy activities compared to the total number of learning episodes, Antoinette used computer technology in 63% of the 52 scheduled literacy instruction block learning episodes. Each literacy instruction block was 180 minutes long for a total of 2,340 minutes of scheduled literacy instruction time. The amount of time she used

technology in her literacy teaching and for the children to participate in literacy-related activities involving technology totaled 950 minutes. Therefore, she used technology for her literacy instruction 40% of the total available literacy instruction block time.

The third gap is between her perception that using technology is always engaging for the children and the children's engagement. To examine this gap, I looked at the children's off-task behavior. In Antoinette's classroom, technology was used in two ways: (a) traditional ways such as chart paper, a CD player, a chart, flashcards, or a photo album, and (b) involving new literacies. During 37% of the learning episodes involving technology, the smart board was used in traditional ways. In 63% of the learning episodes involving technology, her use of the smart board involved the use of new literacies. When she used technology in traditional ways, 34% of the time the children were passive, and 66% of the time they were actively involved. When she used technology involving new literacies, 5% of the time the children were passive, and 95% of the time they were active. In looking at the children's behavior during lessons and activities when technology was used in traditional ways, children were off-task 25% of the time. During lessons and activities when technology involved using new literacies, they were off-task 4% of the time.

The fourth gap is between her perception that technology always facilitates instruction and the children's ability to complete the independent assignment using what they worked on during the instruction. For the assignments connected with a lesson or activity that used technology in a traditional way, 31% of the time the children could not complete the assignment on their own. For assignments connected with a lesson or activity that used technology involving new literacies, 17% of the time the children could not complete the assignment.

The fifth gap is between her perception of the training that is available and the training she has decided to take part in. On the second questionnaire, Antoinette was asked about the technology training she had taken. She responded that the one course she had to take was not helpful and didn't teach her anything because she had already been exposed to the smart board in college. However, she does feel that she would like to see a workshop offered that would show teachers how to enrich their instruction and show them how to do it.

When asked how she finds out about technology training that is offered, she said it is through email or an electronic newsletter. When she was asked to list any technology training she had taken, she only listed the workshop on using the features of the smart board that was required of all the teachers.

In the first interview she was asked about taking one of the technology courses and she felt it was a logistical problem. She contends that it's really hard because not all the workshops are free to teachers, teachers have to sign up for them, and often they don't have enough space for everyone. She also added,

> If you went to one of the classes in order to earn your PLU for that class, you had to have someone come and observe how you integrated it. But, there's not just anyone who comes in and says, 'Hey, I can help you out with this.'

According to the district technology specialist who works with the teachers at this school, from the beginning of the school year until the end of November there have been six technology-training courses offered to the teachers at this school. All of these training classes are free and are open to any teachers at this school who want to attend.

In the interview with the Literacy Coach, when asked about opportunities for teachers to get training, she said the biggest issue always is time. If a teacher takes a class in the afternoon,

they've given up their planning time for that afternoon and that puts them behind. She feels if teachers had more hours in the day many more would be learning a lot more about technology.

The sixth gap is between her perception of her accountability for using technology in her instruction and the principal's expectation for the teachers' use of technology. During the second interview Antoinette was asked that since teachers are held accountable for so much in their classroom, how were teachers being held accountable for using technology in their instruction. She replied "We're not held accountable to teach our children about technology or use technology at some point during our instruction."

When asked if the Principal makes any inquiries to the teachers to get an idea of what they are doing with technology, she said she didn't think so. Then she commented that the Principal really likes to see the teachers using technology in the classroom, gets excited when she comes in and sees the children actually using the smart boards, and is really supportive of the use of technology. As she finished her response to the question on accountability, she added, "I feel like that is somewhere that we need to be somewhat more accountable."

Cross-case Findings

Cross-case analysis begins when the analyses of the individual cases are completed. During cross-case analysis, the researcher tries to develop an explanation that fits across the individual cases. "Ultimately, cross-case analysis differs little from analysis of data in a single qualitative case study" (p. 195). This level of analysis can lead to identifying themes that conceptualize the data from all the cases (Merriam, 1998).

During the cross-case analysis I began looking for what was similar among the cases. Then going through the data again, I looked across the cases to distinguish differences or anything that stood out as unique to a particular case.

When I looked across the cases, to display my data from the cross-case analysis, I created a cross-case comparison chart. This chart includes four headings: (a) Technology used, (b) Facilitating literacy instruction, (c) Modes of meaning making, and (d) New literacies – Interactive. Categories are listed under each heading. Categories under the Technology used heading include (a) smart board, (b) laptop, (c) websites, and (d) software. Categories under the Facilitating literacy instruction heading include (a) daily routines, (b) transitions, (c) Writer's Workshop, (d) Reader's Workshop, (e) Reader's Theatre, and (f) literacy skills. Categories under the Modes of meaning making heading include (a) print, (b) animation, (c) audio/music, (d) graphics, (e) gestural, (f) spatial, (g) linguistic, and (h) multimodal. Categories under the New literacies - interactive heading include (a) click, (b) drag, (c) touch screen links, (d) navigating, and (e) screen writing with an electronic pen. I arranged the chart by teacher and the approach she takes for her teaching. For this chart, I used the following scale:

✓- = 0 -1 time ✓ = 2 - 3 times ✓+ = 4 or more times

I have broken the cross-case comparison chart into the four sections and report on each one. Appendix W includes a completed Cross-case Analysis Comparison Chart.

All three Kindergarten teachers feel that using technology during instruction is always motivating for the children's learning. For my next cross-case comparison, I created a chart to display findings about the level of children's engagement with technology and their ability to complete assignments independently. The categories for this chart include (a) active engagement, (b) passive engagement, (c) off-task behavior, and (d) independent assignment completion. From the within-case analysis data about each teacher's use of technology, I calculated the percentage of time for the children's engagement within each of these categories. Appendix X includes a completed Children's Engagement chart.

For a final cross-case comparison, to display the data about the gaps identified between the teachers' perceptions and practice on using technology during each within-case analysis, I created a Gaps chart. The chart is arranged by teacher name. Under each teacher's name I identified the approach she uses for her teaching. In the chart if the gap was identified for a teacher, I put a check mark under that teacher's name. This allowed me to see which gaps the teachers had in common. It also let me see if there might be any differences among the teachers. Appendix Y shows a completed Gaps chart

Cross-case Comparison Chart

Technology Used

In examining the technology the teachers used, I went back through the within-case findings to see what type of computer technology each teacher used and how often she used it during the observation period in each classroom (see Figure 4.45).

Cross-case Analysis
✓- = 0- 1 time **✓ = 2-3 times** **✓+ = 4 or more times**

Teacher	**Erin**	**Danielle**	**Antoinette**
Teaching Philosophy	Socio-Cognitive Spontaneous	Direct Instruction	Socio-Cognitive Planned
Technology Used			
Smart Board			
laptop			
website			
software			

Figure 4.45. Cross-case comparison chart: Technology used section.

Smart board.

All three of the teachers used the smart board at the "4 or more times" level. Each of the Kindergarten classrooms is equipped with an interactive smart board and the teachers use it as their main type of computer technology. However, there is a range of use between the teachers in the different learning episodes within their literacy instruction block: Morning Meeting, Reader's

Workshop, Writer's Workshop, and Second Daily Dose of Reading Skills Block. There is also a range of the use of the smart board for transition times among the teachers.

Antoinette used the smart board most often. She was observed using it in all four types of learning episodes during her literacy instruction. She used it daily for the Morning Meeting routines, Reader's Workshop chart, and Writer's Workshop chart. She used it over half the time for the Second Daily Dose of Reading Skills Block. And she used it daily for the transition that signaled the end of Morning Meeting time. Her use of it for other classroom management transitions was less consistent because that use hinged on the children finishing their work early and that did not happen every day.

Danielle was observed using the smart board in three of the learning episodes during her literacy instruction. She used it daily for working on the classroom routines during the Morning Meeting. The next episode that she used it on a fairly consistent basis was the Second Daily Dose of Reading Skills Block. She used it, but very seldom, during Reader's Workshop and for a classroom management transition.

Erin was observed using the smart board in all four of the learning episodes but her use varied widely. She used it almost daily during the Morning Meeting as a CD player to play songs and have the children sing along. The other episodes she used the smart board for, in descending order of the frequency, were the Second Daily Dose of Reading Skills Block, Writer's Workshop, Reader's Workshop, and for classroom management transitions.

Laptops.

Each of the teachers used their laptop computers daily for varying purposes. Use of the smart board requires the teacher's to use their laptop computer to access and display files they

have saved on the laptop or on disk or to be able to access the Internet. Therefore, whenever they used the smart board, they were also using the laptop computer.

They were also required to send their attendance and lunch count to the school office via an in-school network. And all of the teachers used their laptop computers to check email during the school day. This school uses email on a regular basis to send out information from the principal, the school office, and other faculty members on a regular basis.

Websites.

Internet websites were used by all the teachers but to differing degrees. Antoinette used website games and activities most often as a transition activity to signal the end of her Morning Meeting episode. She used them with the whole group. She used a wide variety of websites to allow her children to learn while “playing”.

Erin were observed using website activities with small groups of children. She had her children divided into centers and they used the websites as part of their center time rotation.

Danielle was observed using only one website. It was used as a classroom management transition for a very brief amount of time with the whole class, but not all the children had the opportunity to participate in it.

Software.

Looking at their use of computer software, all the teachers used the software that was installed with the smart board most often. Antoinette was the only teacher who was not observed using other types of software programs or applications. She used the smart board software.

Erin used creativity software to create the class book. She rarely used the installed smart board program during the observations.

Danielle used PowerPoint to make digital flashcards that she arranged into a slideshow. She used this slideshow from time to time at the beginning of the Second Daily Dose of Reading Skills Block before moving on to the main lesson activity but not as a transition activity.

Facilitating Literacy Instruction

The next section of the chart examined what the teachers used to facilitate their instruction with technology during the literacy instruction block. It also looked at the literacy skills from the Reading/Writing frameworks involved in the activities (See Figure 4.46).

Cross-case Analysis
✓- = 0- 1 time ✓ = 2-3 times ✓+ = 4 or more times

Teacher	**Erin**	**Danielle**	**Antoinette**
Teaching Philosophy	Socio-Cognitive Spontaneous	Direct Instruction	Socio-Cognitive Planned
Facilitating Literacy Instruction			
Daily Classroom Routines			
Transitions			
Writer's Workshop			
Reader's Workshop			
Reader's Theatre			
Skills			
concepts of print			
phonological awareness			
vocabulary			
phonics/spelling			
fluency			
comprehension			
writing sentences			

Figure 4.46. Cross-case comparison chart: Facilitating literacy instruction section.

Daily classroom routines.

The smart board was used to complete daily classroom routines during the Morning Meeting by Antoinette and Danielle. Antoinette used the smart board during all of her morning routines. Sometimes the children were passive such as during the Morning Message and calendar time. Sometimes they were active participants such as when completing the weather chart.

Danielle used the smart board for her daily classroom routines. The children were passive while doing the Morning Message and the days of the week. They were more active when working on the weather chart. And they were the most active when completing calendar time. The children interacted with the smart board one at a time while the rest of the class watched.

Erin did not use the smart board to work on daily classroom routines. During her Morning Meeting, she consistently used the smart board as a CD player to play music files and the children sang along with the songs.

Transitions.

Antoinette used the smart board daily for a planned transition at the end of her Morning Meeting. She used a variety of website games and activities that reinforced literacy skills found in the Reading framework. Sometimes her role was as a facilitator to guide the children through what to do during the Internet activity and to call on children to take turns to participate. Other times her role was more of an observer to monitor what the children did because the website used audio instructions and feedback during the activity. She used classroom management transitions less frequently because their use depended on how well the children were working on the other learning episode lessons and if they finished early.

Danielle and Erin used transition activities much less often. They were both observed using a classroom management transition only once. Both times it was an Internet game that was used strictly as a fun activity and it was used for only a short time.

Writer's workshop.

Antoinette used the smart board daily to display her Writer's Workshop chart giving the agenda for the day. She also used it quite regularly for demonstrating and modeling what the children would be doing during their independent work time assignment. In both of these uses, the children had a passive stance. She used it occasionally to involve the children in using new literacies on the screen during Writer's Workshop. At these times the children had a more active stance.

Erin used the smart board to create a class book titled *Look at Me*. Beyond showing the children what a page of the book would look like, she did not use the smart board to teach during Writer's Workshop. The children interacted with the smart board one at a time when they wrote their sentences on the screen to create their book page.

Danielle was not observed using the smart board during Writer's Workshop.

Reader's workshop.

Antoinette used the smart board daily to display her Reader's Workshop chart giving the agenda for the day. She also used it quite regularly for demonstrating and modeling what the children would be doing during their independent work time assignment. In both of these uses, the children had a passive stance.

Erin was observed using the smart board very seldom during Reader's Workshop. When she did use it, she used the activity to demonstrate what the children would be doing individually during their work time at the end of the lesson.

Danielle was observed using the smart board only once during Reader's Workshop. She displayed the directions for making the tissue paper flowers for the children to wear for Hispanic Heritage Night. The children were very passive and did not engage at all with the smart board during its use for this activity.

Second daily dose of reading skills block.

All the teachers used the smart board for a variety of purposes during this learning episode. Antoinette used it most often. In the activities she used on the smart board during this episode the children were actively engaged in some activities such as when they corrected sentences on the screen to work on using capitalization and punctuation. For other activities such

as working on a Reader's Theatre poem/song, part of the time they were passive and part of the time they were actively engaged with the screen.

Erin used the smart board for a work center during this episode. She divided the children into three small groups and rotated them in and out of the smart board activity center while she worked with a small group in another center.

Danielle used the smart board only occasionally during this episode. While doing an activity, most of the children were passive because only one child interacted with the screen at a time. She also used it as digital flashcards as a quick activity before or after the main lesson.

Literacy skills.

All the teachers used the smart board to work on literacy skills that make up the English Language Arts Framework for Reading and Writing. The Concepts of Print area of the Reading framework was worked on most often. The frequency that the other literacy skills were involved in the smart board activities, in descending order, were Comprehension, Phonics, Vocabulary, Writing, Fluency, and Phonological Awareness.

Modes of Meaning Making

The next section of the chart examined what modes of meaning making that were found in the activities or lessons (see Figure 4.47). All of the smart board activities involved one or more modes of meaning making. The print mode was the most frequent mode involved in activities. Graphics was the second most frequent mode found. Other modes, in descending order of the frequency they were used in the activities, include audio/music, animation, spatial, and gestural. If an activity involved two or more modes to be able to do the activity properly, it was also counted as a multimodal mode.

Cross-case Analysis

✓- = 0-1 time **✓ = 2-3 times** **✓+ = 4 or more times**

Teacher	Erin	Danielle	Antoinette
Teaching Philosophy	Socio-Cognitive Spontaneous	Direct Instruction	Socio-Cognitive Planned
Modes of Meaning Making			
print			
animation			
audio/music			
graphics			
gestural			
spatial			
multimodal			

Figure 4.47. Cross-case comparison chart: Modes of meaning making section.

Antoinette and Danielle used multimodal activities, however in different ways. Danielle's use of multimodal activities was very teacher-directed and usually engaged only one child at a time while the rest of the class was passive. Antoinette's use of multimodal activities was more student-centered and engaged more children actively participating during the activity. Erin's multimodal activities were used in small groups. She divided the children into work centers and the children rotated through each center during the learning episode.

New literacies – interactive.

The next section of the chart examined the new literacies that were involved in the activities and lessons (see Figure 4.48). The smart board was used in two ways: (a) in a traditional way and (b) involving new literacies. When the teachers used activities that involved new literacies, these new literacies were interactive to make something happen on the screen. By far, the new literacies used most often was clicking on something to activate it. The next most frequently used of the new literacies was dragging something from one location to another on the screen. The other interactive new literacies used, in the order of frequency of use, were navigating on the screen, screen writing using an electronic pen, and touching a screen link.

Antoinette involved her children in using the interactive new literacies most often because she used more Internet websites with the children.

Cross-case Analysis

✓- = 0-1 time **✓ = 2-3 times** **✓+ = 4 or more times**

Teacher	Erin	Danielle	Antoinette
Teaching Philosophy	Socio-Cognitive Spontaneous	Direct Instruction	Socio-Cognitive Planned
New Literacies – Interactive			
click			
drag			
touch screen –link			
navigate on screen			
screen writing w/ electronic pen			

Figure 4.48. Cross-case comparison chart: New literacies-interactive section.

Children's Engagement with Technology

The teachers used the smart board in two ways: (a) in a traditional way such as chart paper, a CD player, video player, or a photo album and (b) involving new literacies. For the next cross-case comparison, I looked at the level of children's engagement with technology and their ability to complete assignments independently. First, I looked at whether the children were in an active or passive stance while the smart board was being used. Second, I looked at whether the children were off-task. And third, I looked at whether the children could complete the independent assignment connected to the lesson that involved the use of technology. Appendix X includes the completed Children's Engagement chart.

Active or Passive Stance

Children in Antoinette's class were active 34% of the time when the smart board was used in a traditional way. They were active 95% of the time when the smart board involved using

new literacies. They were passive 66% of the time when the smart board was used in a traditional way, and passive 5% of the time when it involved using new literacies.

In Danielle's classroom, the children were actively engaged 11% of the time when the smart board was used in a traditional way. They were actively engaged 87% of the time when the smart board involved using new literacies. The children were passive 89% of the time when the smart board was used in a traditional way, and passive 13% of the time when it involved the use of new literacies.

Erin's children were active 46% of the time when the smart board was used in a traditional way. They were active 74% of the time when the smart board involved using new literacies. Her children were passive 54% of the time when the smart board was used in a traditional way, and passive 26% of the time when it involved using new literacies.

Off-task Behavior

The second area of children's engagement with technology I looked at was whether the children were off-task during a lesson involved the use of technology. In Antoinette's class, the children were off-task 25% of the time when the smart board was used in a traditional way. They were off-task 4% of the time when it involved using new literacies.

In Erin's class, the children were off-task 61% of the time when the smart board was used in a traditional way. They were off-task 50% of the time when it involved the use of new literacies.

In Danielle's classroom, children were off-task 0% of the time whether the smart board was used in a traditional way or when it involved using new literacies because she retains strict control of their behavior. She is very teacher-directed when working with her children and

monitors closely what the children are doing while they work on their assignments. She makes sure the children all complete the assignment.

Gaps Between Perception and Practice

As a final step of the cross-case analysis, I looked at the Behavior, the Active/Passive, and the Independent Assignment Completion columns to determine if there was an alignment or misalignment between these three columns to show gaps between the teacher's perception and her practice on using technology during her literacy instruction. I also looked at the interview transcripts and questionnaires for each teacher to see if their perceptions on topics such as the technology training, accountability for technology use, and support for using the technology aligned or misaligned with information gotten on these topics through classroom observations and individual interviews with the Principal, Literacy Coach, and Media Specialist. The last topic I looked at was the amount of time technology was used during the literacy instruction block. I looked to see if each teacher's perception was about how much time she thought she used technology in her instruction aligned or misaligned with how much time was it was actually used based on observations in the classroom.

A total of seven gaps were identified during the with-in case analyses of the data. During the cross-case analysis, all three teachers showed evidence of six of the seven gaps: (a) Technology available / Technology not used; (b) Technology is always engaging and fosters student engagement / Children's engagement; (c) Technology always facilitates instruction / Children's ability to complete independent lesson assignments; (d) Accountability for using technology during instruction / Accountability expectations for use during instruction by the principal; and (e) Amount of time the teacher thinks technology is being used / Amount of time technology is actually used, (f) support available / support not accessed.

Antoinette and Erin showed evidence of the additional seventh identified gap – Training available/Training not taken. Appendix Y includes the completed Gaps Chart.

Findings from the Cross-case Analysis

There were several findings from the cross-case analysis. The first finding is that the way a teacher approached the use of technology seemed to be affected by her approach to teaching. The teacher with the socio-cognitive approach who planned out the technology she would use during her literacy learning episodes to engage her children had more active learners, less off-task behavior to interfere with learning, and more children who could complete their independent assignment. The teacher with the direct instruction approach had much more passive learners who were given very few opportunities to interact with the technology because it was usually done one child at a time while the rest of the children watched. The children were able to complete the lesson assignments because they were not allowed to be off-task. She strictly monitored and led them throughout work time. The teacher with the socio-cognitive approach who used technology spontaneously was sporadic in her use. Sometimes when she used it spontaneously, it did not work the way she wanted it to or it was less effective for what she wanted it to do due to lack of preplanning and/or not having a lesson goal for using it. This sometimes resulted in more off-task behavior and more children who could not complete the lesson assignment during work time.

The second finding is that the new literacies are embedded in the activities or lessons when technology was used. None of the teachers specifically taught the children how to do the interactive new literacies. The children learned to do them through their participation in the activities or lessons. The children helped each other if someone was having trouble with using

one of the interactive new literacies. They were more than happy to tell a child what to do, show a child what to do, or actually help the other child who was having trouble.

The third finding was that the amount of time technology was actually used during literacy instruction was generally below 50%. Each day the scheduled literacy instruction block is three hours long. Within that time period there are 2,340 minutes available for literacy instruction. Erin used technology to facilitate literacy instruction the least amount of time. She used it for 370 minutes or 15% of the literacy instruction block. Of the 52 learning episodes, Erin used technology in only 32% of the episodes.

Danielle used technology to facilitate literacy instruction the next least amount of time. She used it for 430 minutes or 18% of the literacy instruction block. Of the 52 learning episodes, Danielle used technology in only 32% of episodes.

Antoinette used technology to facilitate literacy instruction the greatest amount of time. She was the only teacher who used it more than 50% of the time. She used it for 950 minutes or 63% of the learning episodes.

The fourth finding was that the children have minimal individual time to interact with the technology. The length of time the activities and lessons involving technology lasted varied. When I examined how much time a child actually interacted with the smart board during an activity, the amount of time was very small. For example, during one transition using the Cookie Monster's letter/sound activity, Antoinette used the activity for 20 minutes. There were 14 children in her class. She tried to give as many children as possible to have a chance to participate in the activity. When it was a child's turn to participate, each child interacted with the smart board about 30 seconds per turn. Only a few children during this activity had more than one turn.

The last finding was that gaps between the teachers' perceptions and practices on using technology during literacy instruction persist. Whether the teacher was a veteran teacher or a new teacher didn't seem to have an effect on the gaps that were identified. There was only one gap that was not identified for all the teachers. Danielle is the only teacher who took technology-related training. But, even though she took the training offered, she was not the teacher who used technology to facilitate literacy instruction the most. The other gaps identified were evident for all the teachers.

Limitations of the Study

After working on this study, I feel there are several limitations to it. The first limitation is the time of the school year during which it was conducted. This study was conducted very early in the first semester. School had only been in session for three weeks before the observations began. If this study had been conducted during the second semester of the school year, the results may have come out differently.

The second limitation is that with the strong focus on the teacher, it was difficult to understand students' insights and perspectives on the use of the computer technology. The children were necessary participants but only to be able to observe the teachers' practices of using technology during their literacy instruction. The insights and perspectives of the children on using technology were not studied.

The third limitation is that it would be difficult to find out if the teacher's use of technology was effective for the children's literacy achievement. There was no pre- or post-tests given to the children to see if their literacy achievement improved after the teachers used the technology during their instruction.

CHAPTER 5

IMPLICATIONS

Computer technology has become a fact in American life. Computers are exerting a huge influence on how we live, work, and play. New technologies are now essential tools for businesses and a primary way for people to acquire information. To prepare students to live and work in a technological society, schools have started to enlist the most relevant technological resources and innovations available (Office of Technology Assessment, 1995).

Many children in early childhood classrooms today have been surrounded by a world of technology from the day they were born. They do not know a world without the impact of technology on many aspects of their lives. The potential for technology to change what and how they learn during literacy instruction in the classroom is phenomenal. Schools are beginning to recognize the need to "teach for children's literacy futures" (Leu & Kinzer, 2003, p. 5) and to empower students by integrating the use of technology into the literacy curriculum to provide them with the education they both need and deserve.

> Technology is transforming how we think about education. Computers have changed the way the world works. And we need to make sure our children have the skills to compete in this new global economy. Every single child deserves the opportunity to succeed in the 21st Century (Paige, 2005, para. 5-6).

The purpose of this study was to investigate teachers' perceptions and practices on using technology to facilitate literacy instruction in early childhood classrooms. To guide this study I chose four questions:

1. What perceptions do teachers have about using technology during literacy instruction in early childhood classrooms?
2. What technology are teachers using to facilitate literacy instruction in early childhood classrooms?
3. What modes of meaning making are being supported through the use of technology during literacy instruction?
4. What new literacies are being used during literacy instruction?

After doing the within-case analysis for each teacher and a cross-case analysis, several findings were identified. First, a teacher's approach to teaching influences the way she integrates technology. Second, new literacies are embedded in technology activities, not taught specifically. Third, the amount of time technology is used during instruction is generally small. Fourth, children have minimal individual time to interact with technology. And fifth, gaps (misalignments) between the teachers' perceptions and practices on using technology during literacy instruction persist.

After looking at the findings from this study, there are several implications for research that I can see. There are also several implications for practice.

Implications for Further Research

The first implication for research is that there is a need for longer studies to observe changes in computer use across the year. Most of the studies in the literacy field reporting on research on using computers with reading and writing in the classroom have been short-term studies. These studies covered a wide range of skills involved with reading skills and writing. Mitchell and Fox (2001) examined the effectiveness of using two computer programs that were designed to increase phonological awareness. Boling, Martin, and Martin (2002), investigated

whether a computerized multi-sensory approach to teaching reading would increase the vocabulary development of first grade children. Cuddeback and Ceprano (2002) studied the use of the Accelerated Reader program with early readers. In 2000, van Daal and Reitsma examined how children at the Kindergarten level could independently acquire initial reading and spelling skills through the use of computer-assisted practice. Mioduser, Tur-Kaspa, and Leitner (2000) examined the unique contribution of computer-based instruction compared to more conventional instruction for the acquisition of early reading skills. Barrerra, Rule, & Diemart (2001) investigated the effects of writing on the computer versus writing by hand for the same students. And Lewin (2000) conducted a study concerned with electronic books being used to supplement literacy instruction.

All of these short-term studies focused on the children's use of technology in reading and writing and its effect on their literacy abilities. None of the short-term studies looked at the teacher when the technology was used.

The second implication for research is that there is a need to examine the influence of a teacher's implementation of technology on their perceptions. Currently in the field most of the studies on perceptions are about how perception influences instruction, not how instruction influences perception. For example, Hadley and Sheingold's (1993) nationwide survey looked at teachers who were experienced at integrating computers into their teaching. Their results revealed that teachers that incorporated technology into their teaching believe they have transformed their teaching practice. Another study on perception was Karchmer's study in 2001. The purpose of her study was to explore the perceptions of thirteen exemplary teachers on how the Internet influenced literacy and literacy instruction in the classroom. She concluded that the

teachers knew what they needed to teach but there is a need to explore how to teach these skills through the use of new technologies.

My study traces teachers' perceptions to their practice. There are no studies at this time to say that when teachers implement technology under specific conditions it actually has a reverse effect and transforms their perceptions or gives them a more realistic perception.

The third implication for research is that there is a need for understanding teachers' approaches to teaching in order to tailor training to accommodate new literacies and modalities. Honey and Moeller's (1990) study explored teachers' thinking on how and why teachers do or do not use technologies in their classrooms. These researchers were interested in seeing if there were patterns in teachers' pedagogical beliefs, how teachers talked about what they did in their classrooms, and their instructional objectives that either facilitated or kept them from integrating technology into their curriculum. A second interest was in what would enable teachers and schools to integrate technology into the classroom environment in meaningful ways. The findings of this study showed that high-tech teachers use student-centered pedagogical beliefs to facilitate effective integration of technology into their curriculum and instruction. These teachers made conscious and deliberate efforts to find computer applications that support the kinds of student-centered practices they employ in their classroom. For teachers with educational beliefs and practices that are more traditional there are different and more complicated barriers to integrating technology into their instruction. In order to integrate it into their curriculum, "the very nature of their classroom practices would have to change (p. 13)."

Becker (2000) reported the results of a Teaching, Learning, and Computing survey done in 1998. Data from the survey reported that under the right conditions where teachers' personal philosophies support a student-centered, constructivist pedagogy that involves collaborative

projects, computers are becoming a valuable and well-functioning instructional tool. Traditionally teaching practice was characterized by an emphasis on skill and knowledge transmission that goes from teacher to children. The transmission pedagogy derives from a theory of learning in which student's understanding comes out of carefully planned direct instruction on a skill or topic and guided practice on questions about the topic. The way a teacher uses computers indicates her underlying pedagogical philosophy and teachers who believe in the traditional transmission-oriented approach to teaching find most applications of computer technology incompatible with their instructional goals and use a more limited range of computer applications.

The findings of my study resonate with Becker (2000) and Honey and Moeller's (1990) results. My findings suggest teachers' philosophies and approaches to instruction are the lens through which their use of technology works. We need more research to look at how we can differentiate training for teachers with different approaches to teaching. We need to show them how technology can fit in with their pedagogical beliefs. We need to show them how using technology can be used to teach in ways that are specific to them, their lessons and curriculum, and their classroom. We need to help teachers understand what the new literacies are and how to accommodate them within their lessons. We need to help teachers understand the benefits of using multiple modes of meaning making to give children alternative ways to construct meaning and how to involve modes, beyond the print mode into their teaching. Training is critical to getting teachers to make the move from traditional methods of teaching to more integrated methods involving technology.

Implications for Practice

The first implication for practice is that there is a need for a stronger accountability tie between training and implementation of technology use in the classroom. All three teachers had training available to them provided by the school district. From the beginning of the school year through the observation period of the study, six technology-training classes were offered. Two of the training classes were related to using the smart board. One of the training classes was specifically related to literacy. All of the Kindergarten teachers took the one training that was mandatory for all the teachers before they could begin using the smart board in their classroom. This training provided basic information about the smart board and introduced the teachers to the kinds of things they might do with it. None of them took advantage of other training that might help them implement the smart board technology within their instruction, although one of them had taken some other training previously. According to one teacher, there is no follow up when they do take a training class to see how they are implementing what was learned during the training into their teaching. They were required to take the smart board class, but no one followed up to see what they did with it.

All of the teachers felt it was their choice as to whether they used the smart board with the children. They felt they were not held accountable for using the smart board in their instruction. This differed markedly with the expectations of the principal. According to the Principal, she has told the teachers that she expects them to use the smart board. The primary reason smart boards were installed in the classroom was to be used by the children to give them additional ways of learning. She said she would like them to expand beyond traditional methods of instruction and use the technology to help the children be able to progress to the best of their abilities by engaging them in different ways of learning with and through the technology.

The second implication for practice is that there is a need to capitalize on new modalities to foster affective and cognitive engagement to transfer to independent work. These Kindergarten teachers used the smart board in two ways. First they used it in traditional ways such as a chart, a CD player, a video player, or chart paper. Second they used it involving new literacies. The children were much more actively engaged in the lessons in which the technology involved new literacies. For example, many of the transition activities observed involved new literacies and more than one mode of meaning making. During these activities the children seemed more engaged because of the modes of meaning making such as animation, audio and/or music, and graphics.

In examining the amount of time children were engaged during a lesson, there was much less off-task behavior when the children were engaged with technology involving new literacies and multiple modes of meaning making. After completing a lesson involving the use of technology, when the children were actively engaged in using the technology and involved the use of new literacies and multiple modes of meaning, their ability to complete the independent lesson using what had been taught during the lesson was higher than when the children viewed a lesson as passive observers while technology was used by the teacher only.

The third implication for practice is that there is a need for instructional teacher materials to include technology resources and activities to facilitate traditional and new literacies. All of the Kindergarten teachers commented that they wished there were sources of ideas available for using technology in their literacy instruction with their reading materials. They all explained that the teachers at the Kindergarten level share ideas for using technology when they meet for their weekly planning meeting. But, they would still like more already planned and developed ideas to use. They also wished they had more time to plan and prepare lessons that involve technology.

Planning and time to work with the technology was a unanimous concern. They all reacted positively about the idea of having a source they could go to for lessons that coordinate with the English Language Arts Reading and Writing Framework of performance standards and skills.

The Principal also commented that many of the teachers on the faculty still use traditional ways of teaching and rely on textbooks and manuals for planning their lessons. She feels that it is important to get the teachers to understand that technology engages the children in more active learning. Including technology resources and activities to facilitate traditional and new literacies in teacher's materials could give those teachers who already use technology additional ideas to use as they incorporate technology into their lessons and could act as a springboard for developing other possible ideas specific to their children's needs. It could show teachers who are reluctant to use technology because they don't feel they know how to use it or teachers who are resistant and don't see how technology can fit in with what they are teaching that technology can be used with their curriculum and how it can be used within their lessons and teaching. Also some teachers feel that using technology in their instruction is something to be added on instead of seeing how it can be seen as an integral part of a lesson. Having ideas for both traditional and new literacies included in the teacher's materials could change that view by having resources and activities available for them.

Moving Forward

After completing this study about in-service teachers perceptions and practices on using technology to facilitate literacy instruction in early childhood classrooms and seeing how their perceptions and their approach to teaching had an effect on how they integrated technology into their instruction, another area of research, I would like to pursue is working with pre-service teachers and their perceptions about the use of technology in teaching literacy. Pre-service

teacher educators need to ensure that undergraduate students understand the connections among technology including new literacies, their instructional philosophy, and student learning so they begin to intertwine them to make each indispensable to what is being taught and what is being learned.

Preservice teachers' personal views and experiences with education form the basis of their future classroom practice. If we want teachers to use technology as an integral tool for teaching, we need to start working with pre-service teachers to get them to value using technology. Niederhauser and Stoddart (2001) contend that teachers use technology in ways that are consistent with the teacher's personal beliefs about curriculum and instructional practice. I intend to work with groups of pre-service teachers to find out their perceptions about using technology as students and work with them on learning about how technology might be used as an integral tool in their future classrooms. Then when they move into their first classroom, I intend to continue working with them as they implement technology into their teaching to see if their perceptions change.

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APPENDIX A

STUDIES INVESTIGATING

COMPUTERS AND PHONOLOGICAL AWARENESS

Appendix A: Studies Investigating Computers and Phonological Awareness

Researcher	Year	Methodology	Purpose	Findings
Hurford	1991	Experimental	To track the phonemic processing skills of young beginning readers.	A relationship exists between phonemic processing and reading skills. Digital-to-analog conversion has presented a way for disabled readers and possible at-risk students to interact with a carefully controlled phonemic environment. As a result disabled readers have been able to improve their phonemic processing abilities.
Barker & Torgeson	1995	Experimental	To investigate the effectiveness of newly-developed computer software to increase phonological awareness in young children at risk for reading failure in first grade.	Training increased the children's ability to perform phonological awareness tasks as well as orally presented tasks of phoneme analysis.
Wise, Ring, & Olson	1999	Experimental	To examine whether children with different initial profiles might vary systematically in their benefits from the different types of instruction	Training led to large, highly significant gains for children with reading disabilities compared to gains of children with similar reading problems in the regular class. These results are empowering for teachers.
Howell, Erickson, Stanger, & Wheaton	2000	Experimental	To investigate the effects of the Intellitools Reading Program on: (a) onset-rime word decoding skills, (b) phonemic awareness skills, (c) sight word recognition skills and (d) developmental writing and spelling skills of 1st grade students.	Results are encouraging and provide evidence that a balanced approach to early reading instruction delivered via a carefully constructed computer-based program can be highly effective in increasing a variety of critical skills in young children at risk of reading failure.
Wise, Ring, & Olson	2000	Experimental	To explore how individual differences among children affected outcomes from 27-29 hours of training for children with reading difficulties	Readers with phonological deficits reading at lower reading levels will profit from explicit training in phonological awareness and decoding. As readers improve, the balance of instruction should include increasing amounts of accurate and fluent reading in context with balanced instruction in comprehension.

APPENDIX B

STUDIES INVESTIGATING

COMPUTERS AND VOCABULARY

Appendix B: Studies Investigating Computers and Vocabulary

Researcher	Year	Methodology	Purpose	Findings
Leton & Pertz	1984	Experimental	To simultaneously implement automated reading in a remedial reading program and evaluate its effectiveness.	Random selection of 1st grade students failed to yield comparable groups and the contrast of adjusted posttest scores was not significant. Second grade groups indicated significant achievement gains for the experimental group.
Davidson, Coles, Noyes, & Terrell	1991	Experimental	Whether the speech is intelligible to the children? Whether speech-feedback accelerated acquisition of sight vocabulary?	The computer was perceived as only slightly less intelligible than the teacher. Digitized speech used is sufficiently intelligible to enable children to benefit from using the computer. The system has great potential for helping children learn to read.
Davidson	1994	Experimental	Whether the speech is intelligible to the children? Whether speech/feedback accelerated gains on tests of sight vocabulary?	Results from the sight vocabulary test indicate the system can have an effect on learning to read. Results suggest that the system might be advantageous for pupils provided it is properly managed and objectives were not too ambitious. The use of this system, with more software would be cost-effective means of supplementary teaching.
Davidson, Elcock, & Noyes	1996	Experimental	Evaluate system on gains on tests of sight vocabulary. Examine if time using the system related to the gains. Examine if amount of help requested by subjects was related to their gains.	Results suggest the system can have beneficial effects for children who have access to it. Findings support the conclusion that children will benefit from practice in reading and suggest that this practice can be undertaken using a computer.
Pinkard	2001	Experimental	To explore if Rappin' Reader or Say Say Oh Playmate can serve as effective mechanism to help students use oral knowledge or lyrics as a scaffold in acquiring a written language.	Low SES African-American children can have the same or better improvement rate as middle and high SES European-American students. Students did improve their sight vocabulary by an average of 21%. African-American students performed as well or better than their European-American counterparts

APPENDIX C

STUDIES INVESTIGATING

COMPUTERS AND COMPREHENSION

Appendix C: Studies Investigating Computers and Comprehension

Researcher	Year	Methodology	Purpose	Findings
Calvert, Watson, Brinkley, & Penny	1990	Experimental	To examine effects of action and verbal labels (i.e. naming the object) on children's recall of words in a computer learning context.	Features like action differentially support recall of information depending on the characteristics a child brings to the computer learning situation. Action facilitates verbal recall more so than presentation of the same visual objects in still frame. Computer software adds a new dimension of movement to learning that can't be captured in print media.
Matthew	1997	Experimental	If reading comprehension increases when reading electronic texts. Comprehension of traditional print story-books was compared to comprehension when reading interactive CD-ROM storybooks.	Readers' comprehension can be increased by electronic texts. Comprehension is enhanced by the multi-sensory environment of interactive CD-ROM storybooks and increased motivation to read electronic texts.
White & Kuhn	1997	Experimental	Is there a difference in information recall as related to how information is presented?	No significant difference among the modes of presentation, whether students read material by themselves, had the material read by the teacher, or viewed the multimedia presentation on the computer. The modes where the student interacted with the material produced the greatest amount of factual knowledge recall.
Topping & Paul	1999	Experimental	If differences in reading practice might explain some differences in student reading performance.	A positive relationship between reading practice and reading ability has been strengthened by the study. Some evidence that one causal direction is from practice to achievement. Some evidence to suggest states with higher average tested reading performance have higher levels of reading practice, if the AR sample is representative in these states. Some evidence that private schools have higher rates of reading practice then public schools.

APPENDIX D

STUDIES INVESTIGATING

COMPUTERS AND DECODING AND SPELLING

Appendix D: Studies Investigating Spelling and Decoding

Researcher	Year	Methodology	Purpose	Findings
English, Gerber, & Semmel	1985	Experimental	To investigate if engaged time spent on task is positively correlated with greater achievement, and if computer use tends to diminish engagement.	Results may be interpreted to indicate that microcomputer-administered dictation spelling tests may interfere with the cognitive processes required in spelling for learning handicapped students or add to the problem-solving burden confronted by these students in conventional assessment.
Jones, Torgeson, & Sexton	1987	Experimental	To evaluate a computer program designed to improve the word analysis or decoding skills of poor readers	Results indicate that Hint and Hunt I Program can be used to provide practice that is effective in increasing the fluency of phonological decoding skills in reading disabled children.
Cunningham & Stanovich	1990	Experimental	Compare spelling performance when writing and when using letter tiles to spell words. Investigate a condition where children spelled words by typing them on a computer keyboard. Investigate the efficacy of saying the names of the letters as in the Simultaneous Oral Spelling technique.	Results confirm that training involving writing results in better spelling performance than that attained when training was carried out with tiles and did not involve handwriting. Experiment 2 replicated the finding of Experiment 1 in that training using handwriting was superior to training with tiles and training using a computer.
Wise, Olson, & Treiman	1992	Experimental	To compare the benefits of whole word, BOSS-syllables, onset-rime sub-syllables, and single-grapheme units as aids to word learning.	Presenting words as wholes is as helpful for short-term learning as presenting them segmented into smaller units. Phoneme-by-phoneme units were the least beneficial for all children. Sub-syllables were as helpful for short words as larger units were, and syllables were as helpful as whole words, even for short-term learning.
Scrase	1997	Experimental	To test practicalities of using scanners linked to computers with speech-synthesizers with 7-year-old children.	Children with "global" reading-delay make the most progress with this system. The system is more effective at improving reading than spelling.

APPENDIX E

STUDIES INVESTIGATING

COMPUTERS AND WRITING

Appendix E: Studies Investigating Computers and Acquiring Early Reading Skills

Researcher	Year	Methodology	Purpose	Findings
Goodwin, Goodwin, Nansel, & Helm	1986	Experimental	To investigate effects of computer use on preschoolers' knowledge of reading-readiness concepts and on attitudes toward the computer.	Microcomputer experiences had no effect on the reading skills. Whether or not children had adult assistance made little difference. Study findings lend little support to claims that have been made about positive effects of microcomputer use by preschoolers.
Gore, Morrison, Maas, & Anderson	1989	Experimental	If the computer could be used to teach young children pre-reading skills, especially skills which would directly translate to learning to read in a traditional classroom setting. If subjects could learn basic computer literacy skills without direct instruction and drill.	Specific reading skills can be taught using CAI. The computer provided necessary drill and practice on reading skills. Results of observations indicate the key element in effectively integrating the computer in the preschool program is the selection of developmentally appropriate software.
Boone, Higgins, Morari, & Stump	1996	Experimental	Does hypermedia software provide a strong pedagogical tool for developing or improving letter recognition skills in kindergarten students of varying ability levels? Will the amount of interaction between the students and the software change?	Hypermedia pre-reading software can provide a strong pedagogical tool for developing or improving letter recognition skills in kindergarten students. The amount of interaction between a kindergarten student and a hypermedia pre-reading lesson can be expected to remain relatively constant on weekly lessons over the course of one school year.
Erdner, Guy, & Such	1998	Quasi-Experimental	To explore the potential for CAI to improve acquisition of learning skills in reading development. To examine the relationship of CAI to the development of 1st grade students' reading skills over a complete academic year.	Findings suggest CAI is a viable supplement to traditional reading-instructional practices. CAI can enhance the learning process for some first graders. The unique characteristics of the computer seem to allow for new educational strategies in which the interaction between the student and the learning materials is individualized, attractive, and effective.

APPENDIX F

STUDIES INVESTIGATING

COMPUTERS AND WRITING

Appendix F: Studies Investigating Computers and Writing

Researcher	Year	Methodology	Purpose	Findings
Chang & Osguthorpe	1990	Experimental	To measure the effects of picture-word processing on the reading of Kindergarteners.	Results show the computerized picture-word processor program helped improve Kindergarten children's reading and writing skills over six weeks, but also appeared to have positive attitudinal effects on the children.
Borgh & Dickson	1992	Experimental	To examine the role of synthesized speech during individual use of a word processor.	Results suggest practical applications of "talking" word processors in the classroom. A speech synthesizer could be used to facilitate children's experimentation in the roles of reader, writer, listener, and speaker. Results indicate using a "talking" word processor can lead to increased levels of editing by young children.
Cohen	1993	Experimental	What would be the contribution of synthesized foreign-language speech output to the specific form of computer-supported learning for young children? Is auditory feedback an essential component in the acquisition of reading, or in the learning process in general?	Children were encouraged in their learning processes by the learning situation that was offered. The voice input enhanced the awareness and the speed of acquisition for learning a foreign language, both oral and written, by young children. As these children entered regular primary school, they had a basic knowledge of the French language and a reading ability far beyond native French-speaking children without these opportunities. The children's attitudes and behaviors showed they knew how to be independent in their work.
Chambless & Chambless	1994	Experimental	To compare the academic gains made by 2nd grade students who used Writing To Write classroom networks in second grade and Writing to Read in grades K-1 with those who received traditional instruction in K-2.	The Writing to Write program is an effective educational tool for significantly improving academic achievement of 2nd grade students. Computer-based technology is a powerful tool for teachers to use to motivate students and help them develop higher level thinking skills. It adds a new dimension to thinking and learning.

Lachs & William	1998	Experimental	To examine what children could achieve using hypermedia authoring tools, in particular with non-linear structure.	Primary school pupils are capable of constructing hypermedia stories with non-linear structures with minimal support from others. The use of non-linear structures appears to encourage the integration of separate media to a much greater extent than with linear structures.

APPENDIX G

STUDIES INVESTIGATING

COMPUTERS AND ELECTRONIC BOOKS

Appendix G: Studies Investigating Computers and Electronic Books

Researcher	Year	Methodology	Purpose	Findings
Boone & Higgins	1993	Experimental	To evaluate the impact of multimedia reading materials in a hypermedia format based on the basal reading series being used on children's development of reading skills, participation in reading-related classroom activities, and yearly achievement gains in language skills.	Year 1 results indicate hypermedia CAI reading lessons as a supplement to basal reader instruction hold possibilities for educational use, especially with lower-achieving students Year 2 results corroborated Year 1 findings especially with lower-achieving students. Year 3 achievement gains were markedly less than in Years 1 & 2, although the software was more instructionally complete and should have provided stronger educational intervention.
Miller, Blackstock, & Miller	1994	Experimental	To what extent is the recall list a reliable indicator of reading improvement? What can be learned about a student's reading strategies when using Discis storybooks? How does a student's reading of Discis storybooks differ from his or her reading of hard covered books? Do children differ in their patterns of accessing the help features available in Discis storybooks? Are there particular strategies that students could be taught to maximize the benefit that can be derived from the technology?	Results indicate repeated readings of Discus storybooks with assistance features activated produce a diminution of "search of meaning" miscues as measured by the number of times a student accesses the help features of the program. Combining repeated readings of the same story with the reader assistance features available in Discus books provides a valuable instruction tool for teachers. Discus storybooks may be used most productively if teachers sit beside a child while reading, observing traits and planning future instruction based on observations.

Chu	1995	Experimental	To investigate the various types of reader behavior and literary responses to a computer-based literary experience.	Results indicate young readers are capable to making intertextuality connections to interactive computer books.
Adam & Wild	1997	Experimental	Will using CD-ROM based, multimedia technology storybooks as a strategy in teaching and learning reading, encourage a positive attitude to reading in the reluctant reader and enhance existing positive attitudes to reading in the willing reader?	Reluctant readers from both treatment and control groups recorded a similar and positive development in attitude towards reading over the treatment period. Willing readers maintained their strong positive attitude towards reading.
de Jong & Bus	2002	Experimental	To test how much book format facilitates attention for meaning, phrasing, and text features, comparing reading of a regular and electronic form of the same pictures storybook. To test how the book format relates to internalizations of story meaning, verbal text, and word recognition. To test how reading sessions and subsequent internalizations differ as a function of children's level of emergent literacy.	The expectation that electronic books have the potential to yield reading sessions that are similar or more challenging than those with regular books is not confirmed. Exploration of electronic books is not a replacement for regular book-reading sessions but is a valuable supplement. Suitable electronic books offer overlapping and complementary experiences with the written form of words and the story content. Combined with non-dependence on adult support, electronic books are a useful addition to regular book-reading sessions at home and particularly in Kindergarten classrooms.

APPENDIX H

TEACHER CONSENT FORM

Teacher Consent Form

I, _____, agree to participate in a research study titled "Teachers Using Technology to Facilitate Literacy Instruction in Kindergarten Classrooms", which is being conducted in my classroom with Ms. Mary Susan Love, Doctoral Candidate in the Department of Language and Literacy Education, University of Georgia (706-542-2718) serving as the principal investigator under the supervision of her major professor, Dr. Linda D. Labbo, Professor in the Department of Language and Literacy Education, University of Georgia (706-542-2718). I understand that participation is entirely voluntary and I can withdraw my consent at any time without penalty and have the result of my participation, to the extent that it can be determined, returned to me, removed from the research records, or destroyed.

The following points have been explained to me:

1. The purpose of this project is to investigate how teachers are using computer technologies to facilitate literacy instruction at the Kindergarten level.

2. There are no direct benefits associated with participation.

3. I will be observed as I teach my regularly scheduled literacy/language arts time as I normally do. My students will participate in my literacy instruction and learning experiences as they normally do. I will also complete a questionnaire, participate in two scheduled 1-hour interviews, and collect examples of my student's work from learning experiences involving the use of computer technologies.

4. I will be audio taped while I am teaching in class during the observations. I will also be audio taped during the two 1-hour individual interviews. I understand that the audiotapes will be erased upon the completion of the dissertation research requirements.

5. No discomforts, stresses, or risks are foreseen.

6. The results of this participation will be confidential and will not be released in any individually identifiable form without my prior consent, unless otherwise required by law.

7. The researcher will answer any further questions about the research, now or during the course of the project and can be reached at 706-542-2718 or through email at mslove@uga.edu. If I have concerns or questions about the project, Dr. Labbo can be reached at 706-542-2718 or through email at llabbo@uga.edu.

I understand the procedures described above. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

_____	_____	_____
Name of Researcher	Signature	Date

706-542-2718
mslove@uga.edu

Name of Participant	Signature	Date

Please sign both copies, keep one and return one to the researcher.

Additional questions or problems regarding your rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-mail Address *IRB@uga.edu*

APPENDIX I

PARENT CONSENT FORMS IN ENGLISH AND SPANISH

Parent Consent Form

I agree for my child, _____, to participate in a research study titled "Teachers Using Technology to Facilitate Literacy Instruction in Kindergarten Classrooms", which is being conducted in (name of teacher will appear here)'s classroom with Ms. Mary Susan Love, Doctoral Candidate in the Department of Language and Literacy Education, University of Georgia (706-542-2718) serving as the principal investigator under the supervision of her major professor, Dr. Linda D. Labbo, Professor in the Department of Language and Literacy Education, University of Georgia (706-542-2718). I understand that participation is entirely voluntary; my child and I can withdraw my consent at any time without penalty and have the result of my child's participation, to the extent that it can be determined, returned to me, removed from the research records, or destroyed.

The following points have been explained to my child and me:

1. The purpose of this project is for my child's teacher to participate in a study to investigate how teachers are using computer technologies to facilitate literacy instruction at the Kindergarten level.
2. There are no direct benefits associated with participation.
3. Students will be observed as they participate in their regularly scheduled literacy/language arts time. Examples of my child's work from learning activities involving the use of computer technologies may be collected.
4. No discomforts, stresses, or risks are foreseen.
5. The results of this participation will be confidential and will not be released in any individually identifiable form without my prior consent, unless otherwise required by law.
6. The researcher will answer any further questions about the research, now or during the course of the project and can be reached at 706-542-2718 or through email at mslove@uga.edu. If I have concerns or questions about the project, Dr. Labbo can be reached at 706-532-2718 or through email at llabbo@uga.edu.

I understand the procedures described above. My questions have been answered to my satisfaction, and I agree to allow my child to participate in this study. I have been given a copy of this form.

_____	_____	_____
Name of Researcher 706-542-2718 mslove@uga.edu	Signature	Date
_____	_____	_____
Name of Parent or Guardian	Signature	Date

Please sign both copies, keep one and return one to the researcher.

Additional questions or problems regarding your rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-mail Address IRB@uga.edu

Forma de Consentimiento de los Padres

Yo estoy de acuerdo que mi hijo, _____,participe en una investigación- estudio llamado "Maestros Usando Tecnología para facilitar la enseñanza en los salones de Kindergarten", que se va hacer en el salón de _____ con Ms. Mary Susan Love, Candidata al Doctorado en el Departamento del Lenguaje y Educación Literaria, de la Universidad de Georgia (706-542-2718) como la investigadora principal bajo la supervisión de su profesora principal, Dr. Linda D. Labbo, Professora en el Departamento del Lenguaje y Educación Literaria de la Universidad de Georgia (706-542-2718). Yo entiendo que la participación en esta investigación es totalmente voluntaria; mi hijo y yo podemos retirar este permiso en cualquier momento sin ninguna penalidad, obtener el resultado de la participación de mi hijo, removerlo de la investigación, o destruirlo.

Los siguientes puntos han sido explicados a mi y a mi hijo:

1. El objetivo de este proyecto es que el maestro de mi hijo participe en un estudio para investigar como los maestros están usando tecnologías y computadores en la enseñanza literaria en el salón de kindergarten

2. No hay beneficios asociados con la participación

3. Los estudiantes van a ser observados cuando ellos participen en sus clases regulares de lectura/artes del leguaje. Ejemplos del trabajo de mi niño en actividades de aprendizaje usando tecnología y computadores pueden ser recogidos

4. Incomodidades, estrés, o riesgos no son previstos

5. Los resultados de esta participación son confidenciales y no se harán públicos sin mi permiso.

6. La investigadora va recibir cualquier pregunta sobre esta investigación ahora o durante el transcurso de la investigación. La investigadora puede contactarse en el 706-542-2718 o a través de email: mslove@uga.edu. Si usted tiene preguntas o dudas sobre este proyecto, Dr. Labbo puede contactarse en el 706-532-2718 o a través del e-mail: llabbo@uga.edu.

Yo entiendo todos los procedimientos descritos anteriormente. Todas mis preguntas han sido contestadas, y yo doy consentimiento para que mi hijo participe en esta investigación. He recibido una copia de esta forma

_____	_____	_____
Nombre de la Investigadora 706-542-2718 mslove@uga.edu	Firma	Fecha
_____	_____	_____
Nombre Padre o Guardián	Firma	Fecha

Por favor firme las dos copias, devuelva una a la investigadora y quédese con la otra.

Preguntas adicionales o problemas sobre sus derechos como un participante en una investigación deben ser dirigidas al presidente del Institutional Review Board, de la Universidad de Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Teléfono (706) 542-3199; dirección de correo: IRB@uga.edu

APPENDIX J

LITERACY COACH CONSENT FORM

Literacy Coach Consent Form

I, _____, agree to participate in a research study titled "Teachers Using Technology to Facilitate Literacy Instruction in Kindergarten Classrooms", which is being conducted in Fowler Drive Elementary with Ms. Mary Susan Love, Doctoral Candidate in the Department of Language and Literacy Education, University of Georgia (706-542-2718) serving as the principal investigator under the supervision of her major professor, Dr. Linda D. Labbo, Professor in the Department of Language and Literacy Education, University of Georgia (706-542-2718). I understand that participation is entirely voluntary and I can withdraw my consent at any time without penalty and have the result of my participation, to the extent that it can be determined, returned to me, removed from the research records, or destroyed.

The following points have been explained to me:

1. The purpose of this project is to investigate how teachers are using computer technologies to facilitate literacy instruction at the Kindergarten level.

2. There are no direct benefits associated with participation.

3. I will participate in one 30-minute scheduled individual open-ended interview about the use of computer technologies in my school. I understand that my individual interview will be audio taped. I understand that the audiotapes will be erased upon the completion of the dissertation research requirements.

4. No discomforts, stresses, or risks are foreseen.

5. The results of this participation will be confidential and will not be released in any individually identifiable form without my prior consent, unless otherwise required by law.

6. The researcher will answer any further questions about the research, now or during the course of the project and can be reached at 706-542-2718 or through email at mslove@uga.edu. If I have concerns or questions about the project, Dr. Labbo can be reached at 706-542-2718 or through email at llabbo@uga.edu.

I understand the procedures described above. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

_____	_____	_____
Name of Researcher 706-542-2718 mslove@uga.edu	Signature	Date

_____	_____	_____
Name of Participant	Signature	Date

Please sign both copies, keep one and return one to the researcher.

Additional questions or problems regarding your rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411;Telephone (706) 542-3199; E-mail Address *IRB@uga.edu*

APPENDIX K

QUESTIONNAIRE 1

Teacher Questionnaire 1

Fall 2006

Dear ( ),

Thank you for being interested in participating in this study for my doctoral dissertation, *Teachers' Perceptions and Practices on Using Technology to Facilitate Literacy Instruction in Kindergarten Classrooms*.

I appreciate that you are willing to provide me with this requested information.

Please complete this brief questionnaire and then seal it in the brown envelope provided. I will stop by your classroom and pick up your completed questionnaire on _____.

Thank you again for your time and interest in my study.

Sincerely,

Mary Susan Love
Doctoral Candidate
University of Georgia
Dept. of Language & Literacy Education
mslove@uga.edu
706-542-2718 Reading Education office

As you are working on each item, if more space is needed, please write on the back of the page or attach additional sheets to the questionnaire.

Including this school year, how many years have you been a teacher? _____

How many years have you taught at the Kindergarten level? _____

What other grade levels have you taught? _____

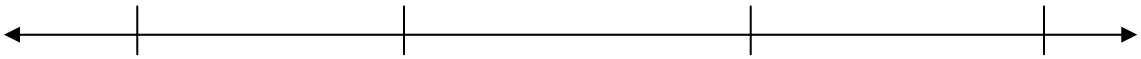
Please describe your teaching style.

Please describe your philosophy on teaching literacy.

Please describe your philosophy of using technology.

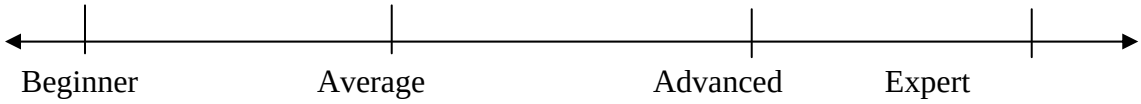
For each of the following items, place an X at any point along the scale line to show how you evaluate yourself for each question.

How would you describe yourself as a computer user?



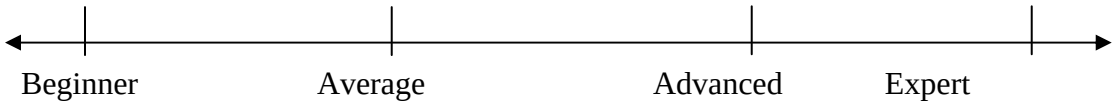
Why did you rate yourself at that point?

How would you describe yourself on your use of computer technologies in your teaching in general?



Why did you rate yourself at that point?

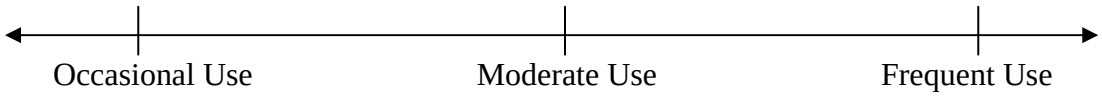
How would you describe yourself on your use of computer technologies during your literacy instruction?



Why did you rate yourself at that point?

How would you describe the frequency of your use of computer technologies during your literacy instruction?
Use the following defintions to help guide your response for this item.

Occasional Use: Implementing technology now and then or for a special occasion during the literacy instruction block time. Maderate Use: Implementing technology ona fairly regular basis during the literacy instruction block time. Frequent Use: Implementing technology daily during the literacy instruction block time.



Thank you for completing the questionnaire!

APPENDIX L

QUESTIONNAIRE 2

Teachers' Perceptions and Practices
on Using Technology
to Facilitate Literacy Instruction
in Kindergarten Classrooms

Teacher Questionnaire
Fall 2006

Dear ( ),

Thank you for being a participant in this study on how teachers are using technology during literacy instruction in Kindergarten classrooms. I appreciate your willingness to give me your input on this topic.

Please complete each item on this questionnaire and then seal it in the brown envelope provided. I will pick up your questionnaire on _____.

Because the information you provide will be used as data for the writing of my dissertation, to provide anonymity to you as a participant, please select a pseudonym for yourself that you would like used.

Pseudonym selected: (first name only)_____

Thank you again for being a part of my study.

Sincerely,

Mary Susan Love
Doctoral Candidate
University of Georgia
Dept. of Language & Literacy Education
mslove@uga.edu
706-542-2718 Reading Education Office

As you are working on each item, if more space is needed, please write on the back of the page or attach additional sheets to the questionnaire.

1. How do you use the computers in your classroom with the children? (Check all that apply.)

_____ skill-and-practice drills (not games)

_____problem-solving software such as simulations

_____word processing

_____working on multimedia projects

_____visiting educational websites

_____finding information on the Internet

_____instructional games

_____CD-Rom talking books

_____other (Please explain)

2. Do you have a Smart Board in your classroom? _____Yes _____No
   If yes, give an example of how you use the Smart Board during your literacy instruction with the children.

3. Have you used the computer to involve your students in digital language experience activities (DLEA)? _____Yes _____No
If yes, please describe one of your DLEA lessons and what the children did.

The Language Experience Approach (LEA) is a method of teaching reading through creating stories using children's own language and personal experiences. The guiding principles of LEA are: (a) what is thought can be spoken, (b) what is spoken can be written, and (c) what is written can be read (Douville, 2000). **Digital Language Experience Activities (DLEA)** enhance LEA experiences by adding digital photography and creativity software. In DLEA there are four key steps: (a) the teacher sets up a learning activity, (b) the teacher photographs the children engaging in the activity using a digitial camera, (c) the teacher imports the digitial pictures into creativity software and the children compose a multimedia story or photo essay about the activity, and (d) during follow-up activities, the children interact with the multi-media story for additional literacy learning (Labbo, Eakle, & Montero, 2002).

4. What types of technologies have you used with your children?
(Check all that apply.)

_____regular printer

_____color printer

_____digital camera

_____digital video camera

_____multimedia authoring software (i.e. KidPix, PowerPoint)

_____Smart Board

_____scanner

_____digital audio recording

_____ other (please specify) _____

Choose one type of technology that you have used and explain how you used it during your literacy instruction.

5. Does this school district require you to take technology training?
___Yes ___No

How well do you feel you are prepared to use computer technologies and the Internet during your literacy instruction?

_____Not prepared _____Somewhat prepared _____Well prepared

Why do you feel that way?

6. What technology related professional development training, technology workshops, or technology courses have you taken?
   Please briefly describe each one and what it involved.

7. How do you use the National Educational Technology Standards for Teachers in planning and implementing your use of computer technologies for your literacy instruction? (A copy of the ISTE teacher standards will be provided if requested.)

8. How do you feel technology has helped you in your literacy teaching?

9. What do you feel are barriers to using computer technologies in your literacy instruction?

10. What would you like to do with your children involving computer technologies and/or the Internet during your literacy instruction that you have not done?

Thank you for completing this questionnaire.

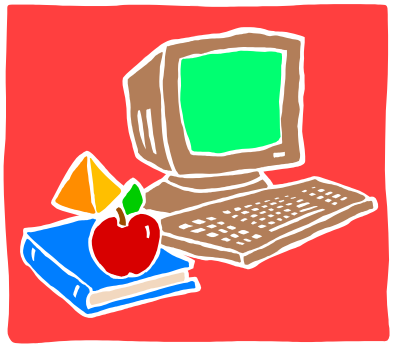
Your input is very much appreciated.

Please place the completed questionnaire in the brown envelope provided.

I will stop by and pick it up. See you then.

APPENDIX M

INTERVIEW GUIDE 1



Interview Guide 1

1. Please tell me about yourself.

2. Please describe yourself as a teacher to someone who has never met you.

3. On the first teacher questionnaire, you described your teaching philosophy. How does using computer technologies fit with your teaching philosophy?

4. What do you feel are positive aspects of using computers and computer technologies in the early childhood classroom?

5. Thinking back on your past experiences working with computer technologies, tell me about a positive experience that you have had using technology during your literacy instruction. Why did you decide to integrate technology into that experience? What effect did the use of technology have on the children during this learning experience?

6. What do you feel are negative aspects of using computers and computer technologies in the early childhood classroom?

7. Thinking back again, tell me about a negative experience you have had using computer technologies during your literacy instruction. Why did you decide to integrate technology into that experience? What do you think happened and why did it turn out to be a negative experience? What effect did the use of technology have on the children during this learning experience?

8. On the questionnaire, you responded about how prepared you feel about using computer technologies in your literacy instruction.
   How do you think your feelings about your technology training affects your decisions for integrating computer technologies into your literacy teaching?

9. In what ways do you think computer technologies are used in schools that are negative for teachers in general? How have computer technologies been used negatively for you?

10. How do you see using computers as part of your classroom learning environment?

11. What role or roles do you think computer technologies can play in the literacy curriculum?

12. How would you describe your school's "culture" in terms of computer technologies use?

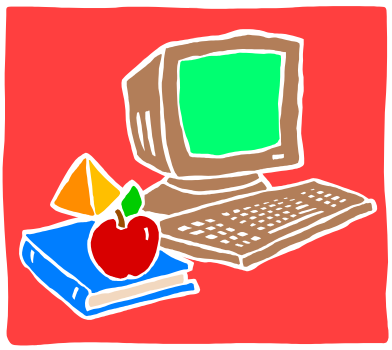
13. What would you tell first year teachers about integrating computer technologies into their literacy instruction?

14. What do you think would be the best assistance for getting teachers to integrate computer technologies into their literacy instruction more?

15. Describe the ideal use of computer technologies in the Kindergarten literacy curriculum.

APPENDIX N

INTERVIEW GUIDE 2



Interview Guide 2

1. How has integrating computer technology changed your teaching practices?

2. How important do you think integrating computer technology is for your learning curriculum?

3. How do you feel using computer technology has helped you in implementing the Kindergarten literacy curriculum?

4. How has using computer technology affected the way you organize the space in your classroom?

5. Do you have certain criteria you use for integrating computer technology to accomplish your literacy instructional goals?

6. What other technology equipment would you like to have available in your classroom to use with your students? How would you incorporate that new equipment into your literacy instruction?

7. On the first questionnaire, you described the frequency of your use of computer technology during your literacy instruction as (Occasional Use/Moderate Use/ Frequent Use). How do you think you could increase your computer technologies use during your literacy instruction?

8. The International Society for Technology in Education (ISTE) has established National Educational Technology Standards for Teachers. How important do you think having national technology standards for teachers is? How well do you think you meet each standard? How important are those standards when you are planning ways to use computer technologies in your literacy instruction?

9. How do teachers at this school share ideas for integrating computer technologies into their literacy instruction? Do teachers involve their students in collaborative projects using computer technologies? Have you involved your children in any collaborative projects with other teachers at this school or at other schools?

10. What personal goals have you set for yourself for using computer technologies in your literacy instruction?

11. Looking at the Kindergarten standards for reading and writing, do you use technology more to work on some stadards more than others? Why?

12. Which of the standards have you integrated technology into?
    Concepts of Print
    Phonological Awareness
    Phonics
    Fluency
    Vocabulary
    Comprehension
    Writing

13. Looking at the elements within each standard, what elements have you integrated technology into your teaching?

14. What subject areas do you integrate techbnology in?

15. Please give the percentage of your technology use in your instruction in the subject areas.
    Reading/Language Arts
    Social Studies
    Math
    Science

16. How are teachers held accountable for using technology in their classrooms?

17. What effect does using technology have on the children's cognitive learning?

18. Is there anything that you have not had the chance to say about using computer technology to facilitate your literacy instruction that you would like to add now?

APPENDIX O

COMPLETED CODING CATEGORY CHART

Coding Category Chart (Blank)

Category 1:	**Skills**		
Source	**Teacher**	**Line#**	**Text**

APPENDIX P

COMPLETED CODING CATEGORY CHART

Completed Coding Category Chart

Category 1:	**Skills**		
Source	**Teacher**	**Line#**	**Text**
Q1	J	003	ability to decode information
Q1	J	008-009	use of language skills, be they spoken or written
Q1	J	010	targeted reading instruction
Q1	J	013- 014	phonemic awareness, process writing, decoding strategies, comprehension strategies
Q1	J	016-018	phonics, word attack skills, vocabulary development, point of view, retelling, story elements, and other strategies
Q1	J	038-039	literacy instruction at a very basic level
Q1	J	041	teach a new concept
O1	J	069	points to each word
O1	J	075-076	capital letters and punctuation marks
O1	J	079	fill in some of the words
O1	J	084	follow directions
O1	J	085	punctuation marks
O1	J	088	find capital letters and punctuation marks
O1	J	106	points to the words
O1	J	108	capital letters in the sentence
O1	J	111-112	points out the punctuation mark (period)
O1	J	118	letter sounds for the alphabet letters
O1	J	125-126	make our picture match our words
O1	J	143	writing their sentences
O1	J	143	use their own spelling to write their sentences
O1	J	146	reinforces the rubric requirements
O1	J	181	reinforce letter sounds – the letter L
O1	J	186	work on L, T, O, J, N, P, Q
O1	J	187	finding pictures

O1	J	188	letter sound
O1	J	188	finding the letter
O1	J	210	points to each word
O1	J	213	find the words that start with “r”
O1	J	220	period at the end of the sentence
O1	J	221-222	rereads each sentence and points to the words
O1	J	223	capital letter
O1	J	224	what sentences end with
O1	J	226	points to each word
O1	J	240	sight words
O1	J	241	read the words together
O1	J	243	read the word
O2	J	026	how many days there are in the week
O2	J	028	how many months there are in the year
O2	J	059	spacing the words
O2	J	066	reads the three sentences as a group
O2	J	067	spaces between words
O2	J	076-077	building the sentence
O2	J	082	putting the words in his sentence in correct order
O2	J	083	reads the sentence to him
O2	J	090	draw a picture to match their words
O2	J	149	predict what the story is about
O2	J	211	what the story will be about to get them to make predictions
O3	J	020-021	points to the letters in the word
O3	J	032-033	works on some Spanish words
O3	J	051	make the sentence "We draw everyday."
O3	J	053-054	build the sentence "We write everyday."
O3	J	056	build the sentence "We read everyday."
O3	J	063	cut the sentence strip apart

O3	J	063-064	cut the sentences apart into words and the period
O3	J	065	arrange the words on their write paper
O3	J	087	points to the words
O3	J	095	pattern created of the motions
O3	J	096	follow the pattern of actions
O3	J	100	guess what the words are abased on the pictures
O3	J	116-117	circles the words
O3	J	118-119	sound out words to spell words
O3	J	125	write their sentence
O3	J	125-126	draw the picture to match the sentence
O3	J	137	child wrote, "I can play."
O3	J	140	second child wrote, "I can jump."
O3	J	142	third child wrote, "I can play."
O3	J	143	fourth child wrote, "I can color."
O3	J	171	points to the words
O3	J	171	read the poem
I1	J	070-071	beginning, middle, and ending sounds
I1	J	071-072	sight words
I1	J	192	rhyming and their phonics
I1	J	321-322	teach phonics or they teach letter sounds or letter names and letter recognition
Q2	J	001	skill-and-practice drills (not games)
Q2	J	114	graphed
Q2	J	115	wrote
O4	J	064-068	asks (questions)
O4	J	068	retell the information they remember
O4	J	111-112	asks the children a question
O4	J	112	name the things in the soup
O4	J	145-146	find the mistakes and correct them
O4	J	147	what is at the beginning of every sentence

O4	J	153	types of sentences
O4	J	201	find the different punctuation marks
O4	J	205	notice the capital letters and punctuation marks
O5	J	116	picture matches her words
O6	J	053	where the story took place/setting
O6	J	055	characters in the story
O6	J	056	read the story
O6	J	056	read the parts of the characters
O6	J	060	reviews the characters
O6	J	062	where the story takes place
O7	J	012	day of the week
O7	J	013	name of the month and the year
O7	J	017	characteristics of the Fall season
O7	J	018	report on the weather
O7	J	019	weather word
O7	J	019-020	finds the work 'fog' on the weather chart
O7	J	024	how many months there are in the year
O7	J	037	explain what characters are
O7	J	037-038	name the animals that are the characters
O7	J	040	name the characters in those stories
O7	J	047	pretend to be a character
O7	J	048	pretend to be a monkey
O7	J	049	ask her questions
O7	J	050	pretends to be an elephant
O7	J	051	questions to ask him
O7	J	053	pretends to be the hippo
O7	J	061-062	text-to-text connection
O7	J	063-064	find a character in one of their books
O7	J	069-070	name their character and has each one read their book

O7	J	078	letters of the alphabet
O7	J	078-079	sounds the letters make
O7	J	080-081	make the sound and do the action
O7	J	084	give the sound
O8	J	030	day it is today
O8	J	030	day was yesterday
O8	J	033	what day it will be tomorrow
O8	J	033	what month it is
O8	J	034	what months was last month
O8	J	034-035	what month it will be next month
O8	J	037-038	points to the days and has the children read the words
O8	J	038-039	how many days are in one week
O8	J	045	how many months there are in the year
O8	J	046	read the names of the months as she points to each one
O8	J	047-048	children read the words
O8	J	053-054	what happens to the trees and the leaves in the Fall
O8	J	061-062	find the sign for today's weather and hangs it on the door
O8	J	088	read the book like a robot
O8	J	088-089	read it fluently in their normal voice
O8	J	156-157	repeat the directions
O8	J	168-169	writing their sentences to go along with their picture
O8	J	208-209	identify vowels
O8	J	211	find the vowels
O8	J	212-213	find a vowel letter and underline it
O8	J	215-216	give the sound the vowel makes
O9	J	021-022	reviews the month and year
O9	J	022	count the days
O9	J	023-024	count how many days
O9	J	029	read the name of the day

O9	J	030	reviews how many days there are in a week
O9	J	034	read the name (month)
O9	J	041	what season it is
O9	J	042	how we know it is the fall season
O9	J	045	reports on the weather outside and changes the weather sign
O9	J	069	what kind of story
O9	J	070	who the characters were
O9	J	072-073	tell what happened in the story in their own words
O9	J	074-075	what happened in the beginning of the story and the end of the story
O9	J	086	read the new book
O9	J	086-087	retell what happened in the story in his own words
O9	J	089	response to the book
O9	J	104	read their story fluently
O9	J	132-133	write a sentence about what they are thankful for and why they are thankful for it
O9	J	137	write their sentences
O9	J	166	copy the sentence neatly
O9	J	182	spelling his words
O10	J	034	what month it is…day…year
O10	J	035	write the date on papers
O10	J	038	count how many days
O10	J	039	count how many school days
O10	J	043	how many days are in a week
O10	J	044	order of the days
O10	J	045	read the name of the day
O10	J	052	read the names of the months
O10	J	058	what season is it
O10	J	058-059	how they know it is fall and what happens in the fall
O10	J	062-063	checks the weather outside and reports that it is sunny…changes the weather word sign
O10	J	072	children count

O10	J	090-091	make predictions about what they thought the story would be about
O10	J	091-092	parts of the book
O10	J	095-096	make some predictions about what will happen next
O10	J	099-100	sequence events happened
O10	J	100	retell the story
O10	J	147-148	children predict what the book is about
O10	J	192	describe the ladybug
O10	J	198	writing describing words about their leaves
O10	J	219	write about their leaves using describing words
O10	J	228	writing about the leaf
O10	J	231	use kid spelling
O10	J	232	stretch out the words to hear the letters in the word
O10	J	307-308	sorting the letters of the alphabet into two categories: vowels and consonants
O10	J	314	sort the letters into two columns
O11	J	027-028	what day it is and what day is tomorrow
O11	J	030	count the number of days
O11	J	031-032	count the number of school days
O11	J	034-035	how many days are in a week
O11	J	036	read the words together
O11	J	043	read those words
O11	J	046-047	read the word
O11	J	049	read the words in order
O11	J	055-056	what season is it
O11	J	056	how we know it is fall
O11	J	071	children count
O11	J	100	predict what they think the book is about
O11	J	104-105	tell something that they noticed in the book
O11	J	110-111	reviews what the title page is and the author/illustrator of the story
O11	J	113	tell what they liked about the book

O11	J	121	self-to-text connections
O11	J	129	class chants about text-to-self connection
O11	J	186-188	children help spell some of the words for her sentences by stretching the words out
O11	J	206	writing describing words for themselves
O12	J	010-011	track the words on the smart board…the class read the message together
O12	J	021	names of the month, number of the day, and the year
O12	J	022	count the days
O12	J	023	count the number of school days
O12	J	024	count the number of days
O12	J	025-026	count the number of days
O12	J	030	read the days of the week
O12	J	031-032	names of the days
O12	J	033	tell the word
O12	J	040	read the names of the months
O12	J	041	name the month she points to
O12	J	049-050	name of the season
O12	J	052	reports today's weather
O12	J	060-061	count by 5s…count by 1s
O12	J	068-069	sound out several words
O12	J	072-073	find the letter on a balloon
O12	J	084	find a holiday word
O12	J	092	find a second (holiday) word
O12	J	097	characters and setting
O12	J	102-103	children make comments about what they think will happen in the story
O12	J	106	tell what was the same in the two stories
O12	J	113	name the characters
O12	J	115	tell the setting in the book
O12	J	121-122	read their books and find the characters
O12	J	122	notice the setting for one

O12	J	128-129	talk about what was in the story and where these things were in the story
O12	J	134-135	predict what the story is about from the title
O12	J	136	reads the story together
O12	J	138	talk about the story after reading it
O12	J	150	point to the words as he reads
O12	J	222-225	children help sound out the words using kid spelling and sight words
O12	J	244	draw their picture of what they talked about
O12	J	245-246	drawing lines of each word that they want to write in their sentence
O12	J	255	read their sentence
O12	J	256-257	sound out the words
O12	J	263-264	read what they wrote to her
O12	J	286	class read all the steps on the chart together
O12	J	287-288	different children tell the steps one at a time in order
O12	J	294-295	read the refrain together as it comes up in the story
O13	J	010	read the message with her as she tracks the words with a yardstick
O13	J	023-024	what day was yesterday, what days it will be tomorrow, and what today is
O13	J	027	count the number of days
O13	J	028	count the number of days
O13	J	029	count the days
O13	J	032-033	read the names of the days
O13	J	036	read the words
O13	J	042	say the names of the months together
O13	J	046	what season it is
O13	J	046	why we know it's fall
O13	J	047-048	reports that today is sunny…puts the word 'sunny' on the weather sign on the door
O13	J	052	count by 10s to 100
O13	J	052	count by 1s
O13	J	079	characters of the story
O13	J	081	where the story took place

O13	J	098-099	text-to-text-to-text connection
O13	J	112	what they see on the cover and asks each one to make a prediction about what the book will be about based on the cover
O13	J	115-116	point to the words as the child reads
O13	J	118	tell her what happened in the book
O13	J	148-149	children read the steps aloud
O13	J	154-155	drawing their pictures
O13	J	157	write their sentences
O13	J	196	read the sentence again

APPENDIX Q

CODING CHART – SET 2 (BLANK)

Coding Chart – Set 2 (Blank)

Category 6:	**Technology used in traditional ways**								
Episode	**Instruction Focus**	**Source**	**Teacher**	**Line#**	**Text**	**Technology Used As**	**Student Behavior**	**Active Passive**	**Independent Assignment Completion**

APPENDIX R

COMPLETED CODING CATEGORY CHART

Completed Coding Chart – Set 2

Category 6:	**Technology used in traditional ways**								
Episode	**Instruction Focus**	**Source**	**Teacher**	**Line#**	**Text**	**Technology Used As**	**Student Behavior**	**Active Passive**	**Independent Assignment Completion**
	Perception	Q1	J	030	teaching tool				
	Perception	Q1	J	030	resource				
	Perception	Q1	J	032	computer programs provided on laptops				
	Perception	Q1	J	054	smart board				
1	Reader's Workshop	O1	J	092	background music playing that is stored on the computer	CD player	_	P	_
2	Writer's Workshop	O1	J	130	writes elements of the rubric on the smart board	Chart	+	P	_
2	Writer's Workshop	O1	J	137	demonstrates what they will do on their paper (like chart paper)	Chart Paper	+	P	_
2	Writer's Workshop	O1	J	138	demonstrates how the paper on the smart board earns the stars	Chart Paper	+	P	_
3	Reader's Theatre	O1	J	208-209	poem on the smart board for reader's theatre	Chart	+	A	+
3	Reader's Theatre	O1	J	216	list of songs on the smart board for the children to sing	CD player	+	A	+
3	Reader's Theatre	O1	J	219	highlight the beginning letter of the sentence on smart board	Chart Paper	+	A	+
4	Skills Block	O1	J	243	read the words showing on the smart board	Flashcard	+	A	_
1	Classroom Mgmt	O2	J	020	taking attendance	Role list	_	P	
2	Reader's Workshop	O2	J	035-036	Reader's Workshop instructions on the smart board	Chart	+	P	_
3	Writer's Workshop	O2	J	141-145	Writer's Workshop instructions on the smart board	Chart	_	P	_
3	Writer's Workshop	O2	J	164-166	uses the smart board to demonstrate the directions/ draws a picture and writes, "I like Mrs. Jenny."	Chart	_	P	_

1	Reader's Workshop	O3	J	035-036	brings up plans for Reader's Workshop	Chart	+	P	_
2	Writer's Workshop	O3	J	111-112	recreates what the paper will look like	Chart Paper	+	P	_
2	Writer's Workshop	O3	J	113	demonstrates how the children will do their work	Chart Paper	_	P	_
2	Classroom Mgmt	O3	J	124	background music	CD player	_	P	_
2	Writer's Workshop	O3	J	137-138	rubric on the smart board	Chart	+	P	+
3	Classroom Mgmt	O3	J	147	plays background music	CD player	_	P	
4	Reader's Theatre	O3	J	167-168	poem/song: Today It Is Raining	Chart	+	A	+
	Perception	Q2	J	001	skill-and-practice drills (not games)				
	Perception	Q2	J	005	educational websites				
	Perception	Q2	J	007	instructional games				
	Perception	Q2	J	117	regular printer				
	Perception	Q2	J	118	color printer				
1	Morning Meeting	O4	J	013-021	morning message on the smart board	Chart	+	A	+
1	Morning Meeting	O4	J	023	calendar on the smart board	Bulletin Boardd	+	A	+
1	Morning Meeting	O4	J	026	days of the week on the smart board	Chart	+	A	+
1	Morning Meeting	O4	J	031-032	months are listed down the center of the screen	Chart	+	A	+
1	Morning Meeting	O4	J	035	picture on the smart board for the weather	Chart	+	A	+
2	Writer's Workshop	O4	J	119-127	Writer's Workshop on the screen	Chart	_	P	_
2	Classroom Mgmt	O4	J	168	classical music playing in the background	CD player	_	P	_
1	Writer's Workshop	O5	J	101-104	Writer's workshop instruction	Chart	_	P	_

1	Writer's Workshop	O5	J	107	writes the examples: I like cats. They are fun. I can play with them.	Chart Paper	+	P	_
1	Morning Meeting	O6	J	005	morning message on the smart board	Chart	+	P	+
1	Morning Meeting	O6	J	015	calendar on the smart board	Bulletin Board	+	A	+
1	Morning Meeting	O6	J	016-017	days of the week screen	Chart	+	A	+
1	Morning Meeting	O6	J	020	next screen is the months of the year	Chart	+	A	+
1	Morning Meeting	O6	J	025	next screen is about the seasons	Chart	+	A	+
1	Morning Meeting	O6	J	036	weather screen on the smart board	Chart	+	A	+
1	Morning Meeting	O6	J	037	several choices at the bottom of the screen	Chart	+	A	+
2	Reader's Workshop	O6	J	041-045	Reader's Workshop	Chart	_	P	+
1	Morning Meeting	O7	J	016-027	morning message on the smart board	Chart	+	A	+
1	Morning Meeting	O8	J	029	next screen on the smart board is the calendar	Bulletin Boardd	+	A	+
1	Morning Meeting	O8	J	037	next screen is the Days of the Week	Chart	+	A	+
1	Morning Meeting	O8	J	052	next screen is about the season	Chart	+	A	+
1	Morning Meeting	O8	J	060	next screen is the weather screen	Chart	+	A	+
1	Morning Meeting	O8	J	062-063	circles the symbol for Windy on the smart board	Chart	+	A	+
2	Reader's Workshop	O8	J	069-075	Reader's Workshop screen	Chart	+	P	_
3	Writer's Workshop	O8	J	150-153	draws a pumpkin shell on the board. She draws a picture of her baby in the window. Then she writes her sentence under the picture using kid spelling	Chart Paper	+	P	_

4	Transition Activity	O8	J	240	practice screen for writing the letters	Paper	+	A	+
4	Transition Activity	O8	J	243	blank screen and children practice letters she demonstrates first	Paper	+	A	+
1	Morning Meeting	O9	J	011-018	morning message on the smart board	Chart	+	A	+
1	Morning Meeting	O9	J	021	calendar screen	Bulletin Board	+	A	+
1	Morning Meeting	O9	J	028	days of the week screen	Chart	+	A	+
1	Morning Meeting	O9	J	033	next screen is the months of the year	Chart	+	A	+
1	Morning Meeting	O9	J	041	next screen is about the season	Chart	+	A	+
1	Morning Meeting	O9	J	044	next screen is about the weather	Chart	+	A	+
1	Morning Meeting	O9	J	046	circles the weather word on the smart board	Chart	+	A	+
2	Reader's Workshop	O9	J	055-060	next screen showed Reader's Workshop	Chart	_	P	_
3	Writer's Workshop	O9	J	111-116	Writer's Workshop screen on the smart board	Chart	+	P	_
3	Writer's Workshop	O9	J	121	shows pictures of different quilts on the smart board	Photo Album	+	P	_
3	Writer's Workshop	O9	J	123	demonstrates what they will do by writing on the board	Chart Paper	+	P	_
3	Writer's Workshop	O9	J	125-126	demonstrates that they will draw a picture on the paper of who they are thankful for	Paper	+	P	_
3	Writer's Workshop	O9	J	126-127	demonstrates by drawing a picture on the smart board to illustrate the sentence she wrote	Chart Paper	+	P	_
1	Morning Meeting	O10	J	016-025	first screen is the morning message	Chart	+	A	+
1	Morning Meeting	O10	J	033	next screen is the calendar	Bulletin Board	+	A	+

1	Morning Meeting	O10	J	042	next screen is the Days of the week screen	Chart	+	A	+
1	Morning Meeting	O10	J	057	next screen is about the season	Chart	+	A	+
1	Morning Meeting	O10	J	061	next screen is the weather screen	Chart	+	A	+
1	Morning Meeting	O10	J	064-065	circles the weather word on the smart board	Chart	+	A	+
1	Morning Meeting	O10	J	068-070	number chart on the smart board…touches each number square, the square rotates and turns to a different color	Chart	+	A	+
2	Reader's Workshop	O10	J	077-084	Reader's Workshop screen	Chart	+	P	_
3	Writer's Workshop	O10	J	179-183	Writer's Workshop	Chart	+	P	_
1	Morning Meeting	O11	J	010-016	morning message on the smart board	Chart	+	A	+
1	Morning Meeting	O11	J	027	next screen is the calendar	Bulletin Board	+	A	+
1	Morning Meeting	O11	J	034	next screen is the Days of the Week	Chart	+	A	+
1	Morning Meeting	O11	J	037-038	circle the days of the week on the smart board	Chart	+	A	+
1	Morning Meeting	O11	J	039	circle the day tht will be tomorrow	Chart	+	A	+
1	Morning Meeting	O11	J	041	circle the day that names yesterday	Chart	+	A	+
1	Morning Meeting	O11	J	045	next screen is the months of the year	Chart	+	A	+
1	Morning Meeting	O11	J	055	next screen is the season screen	Chart	+	A	+
1	Morning Meeting	O11	J	065	next screen is the weather screen	Chart	+	A	+
1	Morning Meeting	O11	J	070-071	count to 100	Chart	+	A	+

2	Reader's Workshop	O11	J	084-089	Reader's Workshop instructions on the smart board	Chart	+	P	_
1	Morning Meeting	O12	J	009-018	morning message on the smart board	Chart	+	A	+
1	Morning Meeting	O12	J	020	calendar on the smart board	Bulletin Board	+	A	+
1	Morning Meeting	O12	J	028	next screen is the days of the week	Chart	+	A	+
1	Morning Meeting	O12	J	029	helper cards on the white board	Flashcard	+	A	+
1	Morning Meeting	O12	J	039	next screen is the Months of the year	Chart	+	A	+
1	Morning Meeting	O12	J	049	next screen is the weather screen	Chart	+	A	+
1	Morning Meeting	O12	J	053-054	circle 'cloudy' and 'sunny' on the smart board	Chart	+	A	+
1	Morning Meeting	O12	J	057-058	counting chart on the screen…she touches each square which turns from gray to red	Chart	+	A	+
2	Reader's Workshop	O12	J	075-082	Reader's Workshop screen	Chart	+	P	+
3	Writer's Workshop	O12	J	192-200	Writer's Workshop screen on the smart board	Chart	+	P	_
3	Writer's Workshop	O12	J	202-210	screen with 6 Steps Good Writers Use	Chart	+	P	_
3	Writer's Workshop	O12	J	212-222	screen with blank lines on it…draws a picture on the top half of the screen…writes a little nine on her pictures to remind he how many she is going to write…begins writing her sentence words	Paper	+	P	_
1	Morning Meeting	O13	J	009	morning message on the smart board	Chart	+	A	+
1	Morning Meeting	O13	J	051	screen works on counting to 100	Chart	+	A	+
1	Morning Meeting	O13	J	022	calendar screen on the smart board	Bulletin Board	+	A	+

1	Morning Meeting	O13	J	032	next screen is the Days of the Week	Chart	+	A	+
1	Morning Meeting	O13	J	041	changes screen to the Months screen	Chart	+	A	+
1	Morning Meeting	O13	J	045	next screen is about the season and weather	Chart	+	A	+
2	Reader's Workshop	O13	J	064-071	Reader's Workshop instructions on the smart board	Chart	+	P	_
3	Writer's Workshop	O13	J	142	Writer's Workshop innstructions+E126 on the smart board	Chart	+	P	+
3	Writer's Workshop	O13	J	144-145	6 Steps Good Writers Use	Chart	+	P	+
4	Skills Block	O13	J	174-176	writes the word 'one' on the screen…next she writes the words 'three', 'six' , and 'five' on the screen. Writes the numeral next to each number word'	Chart Paper	+	A	+
4	Skills Block	O13	J	178-179	writes the sentence: Every number has a number word to match it.	Chart Paper	_	P	_
4	Skills Block	O13	J	181-183	writes the number word 'seven' on the screen…girl writes the numeral under the word	Chart Paper	+	A	+
4	Skills Block	O13	J	183-184	writes the number 'nine' on the screen…girl writes the numeral under the word	Chart Paper	+	A	+
4	Skills Block	O13	J	187-188	writes the word 'three' on the screen…boy writes the number on the screen	Chart Paper	+	A	+
4	Skills Block	O13	J	190-191	writes the word 'one' …boy writes the numeral on the screen	Chart Paper	+	A	+
4	Skills Block	O13	J	192-193	writes the word 'five'…boy writes a 5 after she helps him	Chart Paper	+	A	+
4	Skills Block	O13	J	194-195	writes the word 'four'…boys writes the number 4.	Chart Paper	+	A	+
4	Skills Block	O13	J	205	writes the sentence on the smart board with her finger	Chart Paper	+	P	_

APPENDIX S

CROSS-CASE COMPARISON CHART (BLANK)

Cross-case Comparison Chart

✓- = 0- 1 time **✓ = 2-3 times** **✓+ = 4 or more times**

Teacher	Erin	Danielle	Antoinette
Teaching Philosophy	Socio-Cognitive Spontaneous	Direct Instruction	Socio-Cognitive Planned
Technology Used			
Smart Board			
laptop			
website			
software			
Facilitating Literacy Instruction			
Daily Classroom Routines			
Transitions			
Writer's Workshop			
Reader's Workshop			
Reader's Theatre			
Skills			
Concepts of Print			
Phonological Awareness			
Vocabulary			
Phonics/Spelling			
Fluency			
Comprehension			
Writing sentences			
Modes of Meaning Making			
print			
animation			
audio/music			
graphics			
gestural			
spatial			
multimodal			
New Literacies – Interactive			
click			
drag			
touch screen –link			
navigate on screen			
screen writing w/ electronic pen			

APPENDIX T

CHILDREN'S ENGAGEMENT CHART (BLANK)

Children's Engagement Chart

Teacher	**Erin**	**Erin**	**Danielle**	**Danielle**	**Antoinette**	**Antoinette**
	Traditional use	**New Literacies**	**Traditional use**	**New Literacies**	**Traditional use**	**New Literacies**
active child stance						
passive child stance						
off-task behavior						
independent assignment completion						

APPENDIX U

GAPS CHART (BLANK)

GAPS CHART

✓ = If gap is seen for the teacher

Perception		Practice	Teacher		
			Erin	**Danielle**	**Antoinette**
Technology available		Technology not used			
Amount of time teacher thinks technology is used		Amount of time technology is actually used			
Technology is always engaging/ fosters student engagement		Level of student engagement			
Technology always facilitates instruction		Children's completion of independent assignment			
Training available		Training taken			
Accountability for using technology in instruction		Accountability expectation of use by principal			
Support available		Support not accessed			

APPENDIX V

ENGLISH LANGUAGE ARTS – KINDERGARTEN FRAMEWORK

Kindergarten ~ Reading

ELAKR1
Concepts of Print
The student demonstrates knowledge of concepts of print.

"GPS Talk"	"Kid Talk"
★ a. recognizes that print and pictures (signs and labels, newspapers, and informational books) can inform, entertain, and persuade	I read for fun. I read to learn.
b. demonstrates that print has meaning and represents spoken language in written form	Print is my talk written down.
★ c. tracks text read from left to right and top to bottom	I read from left to right and top to bottom.
d. distinguishes among written letters, words, and sentences	I write letters. I write words. I write sentences!
e. recognizes that sentences in print are made up of separate words	I write sentences. Sentences are words put together that make sense.
f. begins to understand that punctuation and capitalization are used in all written sentences	I begin my sentences with a capital letter and end them with a punctuation mark.

ELAKR2 *Phonological Awareness* The student demonstrates the ability to identify and orally manipulate words and individual sounds within those spoken words.	
a. identifies and produces rhyming words in response to an oral prompt and distinguishes rhyming and non-rhyming words	I can rhyme. I can tell when words rhyme and when they don't.
b. identifies component sounds (phonemes and combinations of phonemes) in spoken words	I hear and say the sounds I hear in words.
c. blends and segments syllables in spoken words	I say the syllables in words slowly and then put them back together again.
d. segments the phonemes in high frequency words	I say the sounds in my sight words.
e. blends spoken phonemes to make high frequency words.	I put each sound in my sight words together to say them.

ELAKR3 *Phonics* The student demonstrates the relationship between letters and letter combinations of written words and the sounds of spoken words.	
a. demonstrates an understanding that there are systematic and predictable relationships between print and spoken sound.	I point to each word as I read.
b. recognizes and names all uppercase and lowercase letters of the alphabet	I say the names of all the letters of the alphabet, capital and lower case too!
c. matches all consonant and short-vowel sounds to appropriate letters	I know the sounds of all the letters of the alphabet.
d. blends individual sounds to read one-syllable decodable words	I use letter sounds to make words.
e. applies learned phonics skills when reading words and sentences in stories	I use letter sounds and chunks to figure out "bumpy" words.

ELAKR4 *Fluency*		ELAKR5 *Vocabulary*	
The student demonstrates the ability to read orally with speed, accuracy, and expression.		The student acquires and uses grade-level words to communicate effectively.	
a. reads previously taught high frequency words at the rate of 30 words correct per minute	I can read 30 sight words in one minute!	a. listens to a variety of texts and uses new vocabulary in oral language	I listen carefully when my teacher reads to us. I'm listening for interesting new words. I'm a word detective!
b. reads previously taught grade-level text with appropriate expression	I change my voice when I read to match the feelings of the characters.	b. discusses the meaning of words and understands that some words have multiple meanings	I use these "sticky" words when I talk and when I write. I talk about interesting new words! I know that some words have more than one meaning.

ELAKR6
Comprehension

The student gains meaning from orally presented text.

a. listens to and reads a variety of literary (e.g., short stories, poems) and informational texts and materials to gain knowledge and for pleasure	I listen and learn when my teacher reads to my class. I enjoy read-alouds!
b. makes predictions from pictures and titles	I make predictions by talking about the pictures and the title.
c. asks and answers questions about essential narrative elements (e.g. beginning-middle-end, setting, characters, problems, events, resolution) of a read-aloud text	I tell about the beginning, middle, and end of a story. I tell about the characters and the setting. I tell about the problems and resolution too!
d. begins to distinguish fact from fiction in a read-aloud text	I tell when my teacher is reading fact or fiction.
e. retells familiar events and stories to include beginning, middle, and end	I tell the beginning, middle, and end of an event or a story.
f. uses prior knowledge, graphic features (illustrations), and graphic organizers to understand text	I use what I know to help me understand stories. I check the picture. I use graphic organizers.
g. connects life experiences to read-aloud text	I make text-to-self connections.
h. retells important facts in the students' own words	I retell all the important parts of a story in my very own words.

Kindergarten ~ Writing	
ELAKW1 ***Writing*** The student begins to understand the principles of writing.	
★ a. writes or dictates to describe familiar persons, places, objects, or experiences	I write about important people, places, things, and experiences.
★ b. uses drawings, letters, and phonetically spelled words to create meaning.	I use drawings, letters, and "kid writing" to tell a story.
★ c. accurately prints name, all uppercase and lowercase letters of the alphabet, and teacher-selected words	I write my name and all the capital and lowercase letters. I spell with "kid writing" and sometimes I spell the grown-up way.
★ d. uses left-to-right pattern of writing	I write from left to right.
e. begins to use capitalization at the beginning of sentences and punctuation (periods and question marks) at the end of sentences	I use capital letters at the beginning of my sentences and periods or question marks at the end.

APPENDIX W

CROSS-CASE COMPARISON CHART - COMPLETED

Cross-case Comparison Chart

✓- = 0- 1 time **✓ = 2-3 times** **✓+ = 4 or more times**

Teacher	Erin	Danielle	Antoinette
Teaching Philosophy	Socio-Cognitive Spontaneous	Direct Instruction	Socio-Cognitive Planned
Technology Used			
Smart Board	✓+	✓+	✓+
laptop	✓+	✓+	✓+
website	✓	✓-	✓+
software	✓-	✓-	✓+
Facilitating Literacy Instruction			
Daily Classroom Routines	✓-	✓+	✓+
Transitions	✓-	✓-	✓+
Writer's Workshop	✓-	✓-	✓+
Reader's Workshop	✓	✓-	✓+
Second Daily Dose of Reading Skills	✓-	✓-	✓+
Skills			
Concepts of Print	✓	✓+	✓+
Phonological Awareness	✓-	✓-	✓-
Vocabulary	✓	✓-	✓+
Phonics/Spelling	✓-	✓-	✓+
Fluency	✓-	✓	✓+
Comprehension	✓	✓	✓+
Writing	✓-	✓-	✓+
Modes of Meaning Making			
print	✓+	✓+	✓+
animation	✓-	✓-	✓+
audio/music	✓+	✓-	✓+
graphics	✓+	✓-	✓+
gestural	✓-	✓-	✓
spatial	✓	✓	✓+
multimodal	✓	✓	✓+
New Literacies – Interactive			
click	✓	✓	✓+
drag	✓	✓	✓+
touch screen –link	✓-	✓	✓
navigate on screen	✓-	✓	✓+
screen writing w/ electronic pen	✓-	✓-	✓+

APPENDIX X

COMPLETED CHILDREN'S ENGAGEMENT CHART

Children's Engagement Chart

Teacher	**Erin**	**Erin**	**Danielle**	**Danielle**	**Antoinette**	**Antoinette**
	Traditional use	**New Literacies**	**Traditional use**	**New Literacies**	**Traditional use**	**New Literacies**
Active child stance	46%	74%	11%	87%	34%	95%
Passive child stance	54%	26%	89%	13%	66%	5%
Off-task behavior	38%	40%	0%	0%	25%	4%
Independent assignment completion	61%	50%	100%	100%	55%	12%

APPENDIX Y

COMPLETED GAPS CHART

GAPS CHART

✓ = If gap is seen for the teacher

Perception		Practice	Teacher		
			Erin	**Danielle**	**Antoinette**
Technology available		Technology not used	✓	✓	✓
Amount of time teacher thinks technology is used		Amount of time technology is actually used	✓	✓	✓
Technology is always engaging/ fosters student engagement		Level of student engagement	✓	✓	✓
Technology always facilitates instruction		Children's completion of independent assignment	✓	✓	✓
Training available		Training taken	✓		✓
Accountability for using technology in instruction		Accountability expectation of use by principal	✓	✓	✓
Support available		Support not accessed	✓	✓	✓