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A Mixed Methods Case Study Exploring the Outcomes of Implementing a Digital Learning Management System In A Fourth Grade Language Arts Classroom

Sarah C. Mayberry

A MIXED METHODS CASE STUDY EXPLORING THE OUTCOMES OF IMPLEMENTING

A DIGITAL LEARNING MANAGEMENT SYSTEM IN A FOURTH GRADE LANGAUGE

ARTS CLASSROOM

by

SARAH CARPENTER MAYBERRY

(Under the Direction of Judith Repman)

ABSTRACT

Classrooms of today are in continual flux and state and local mandates are constantly reforming the curriculum in order to help prepare students to compete in a global society; in addition, advancements in technology have greatly impacted today's students and how they learn as well as the way teachers instruct. As educators, we need to recognize what our students need to become successful citizens in today's society, which often requires students to be critical evaluators of various types of information and requires them to become literate across a wide range of literacies. Not only is it critical that classroom teachers instruct students in the effective use of technology and the new literacies, but it is also important that teachers understand the impact that the technology revolution has had on economically disadvantaged students.

The purpose of this mixed-methods study was to explore how the effective integration of information and communication technologies helps identify and develop the skills and behaviors to support the new literacies in a fourth grade classroom of economically disadvantaged students and to better understand the opportunities for access to technology among these students. The study revealed that these skills include participating in on-line discussions, searching for information on-line, sharing created files, engagement in multimedia websites, use of various types of language, exploring Internet browsers, and exploring word processing applications. This

research sought to understand the levels of learning that were encouraged through the discussions and tasks. The levels of learning were based on Bloom's taxonomy and identified the level of cognitive complexity of each discussion and task. The researcher revealed that many of the discussions and tasks did require higher level thinking skills.

Finally, this research study sought to understand the access and use of the Internet by economically disadvantaged students in informal environments. Through survey research, the data described a lack of Internet access and usage among the economically disadvantaged students in this study. Additionally, the data revealed that when the students in this research study used the Internet they typically accessed games, videos, sites of personal interest, and CRCT practice sites.

INDEX WORDS: Social learning, Digital literacy, New Literacies, New literacy skills, Digital natives, Learning management system, Critical literacy, Constructivism

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SARAH CARPENTER MAYBERRY

B.S., Georgia Southern University, 2002

M.Ed, Georgia Southern University, 2004

Ed.S, Georgia College & State University, 2009

A Dissertation Submitted to the Graduate Faculty of Georgia Southern University in

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SARAH CARPENTER MAYBERRY

Major Professor: Judith Repman
Committee: Grigory Dmitriyev
                    Marlynn Griffin
                    Caren Town

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DEDICATION

I would like to dedicate this dissertation to my many family members that continually encouraged me and supported me throughout this tedious process. I would like to dedicate this dissertation to my husband, Scott. He continually supported me and motivated me to believe in myself. This dissertation is also dedicated to my daughter, Lila Kate. She reminds me each day of the important work that educators do, and she motivates me to be the best teacher that I can be for all of the students that I serve. Through her eyes, I understand the importance of creating a stronger and more equal education system that encourages students to be thinkers and active learners.

Finally, I would like to dedicate this dissertation to my parents, Mike and Rebecca Carpenter, my in-laws, and my sisters. Each of them have set a standard for learning and taught me that learning is never final. They encouraged me to dare to dream and to reach my goals.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

In every school, a culture of learning exists; however, it can differ immensely from classroom to classroom. In some classrooms, students are actively engaged in lessons while being directed through teacher guidance; students are a vital part of the learning community as they share their experiences with others in small group learning stations. In some classrooms, students are expected to show their learning through various types of assessments. In these same rooms, students are moving around the classroom from small groups to computers and even other locations throughout the school. The teacher busily manages the different groups and offers attention and advice as the students work. Rather than using a standardized text such as a basal reader to teach reading and literacy understandings, teachers use texts based on student reading level and interest. Other schools have students who sit quietly at their desks and take notes while the teacher lectures at the front of the room. Students have very little interaction among their peers and feedback from the teacher is limited to numerical grades. At the end of each chapter of the textbook, a standardized, pencil and paper test is administered to assess the students' learning. All of the students read from the same reading text regardless of their independent reading level; few to no connections are made between the printed text and the personal lives of the students.

Why do the classrooms described above vary so greatly? Why are some classrooms deeply centered on helping students to become self-directed learners who learn through their own experiences as well as the experiences of others while preparing them for the technology rich world in which we live, yet other classrooms are not? In light of the many changes in

education related to technology and literacy, many classroom teachers struggle to find ways to successfully connect student learning that is meaningful and prepares them for the literate world that is rapidly being changed by information and communication technologies. Often times, these efforts are furthered hampered by constricting and rigid reform efforts like No Child Left Behind (NCLB) and Race to the Top (RTTP). A limited schedule with accountability demands often burden teachers; classroom instruction may tend to look more like skill and drill rather than creative spaces for curiosity and personal learning.

It must be noted that many teachers continue to teach as they always have despite greater access than ever to information and communication technology (ICT) overlooking the fact that social forces, globalization, and the proliferation of ICTs require literacies expand the traditional notions of literacy (Coiro, Knobel, Lankshear, & Leu, 2008; Darling-Hammond, 2010; Leander, 2008; Rosen, 2010). Therefore, it is increasingly imperative to understand ways in which teachers are capable of using ICTs and teaching the new literacies, how students apply and practice new literacies, and how these changes in the classroom impact their learning outside of schools in order to equip them with the 21st century skills necessary for fully functioning in a global society (Coiro, Knobel, Lankshear, & Leu, 2008).

Background of the Study

During the 2011-2012 school year, a diverse group of participants in central Georgia had the invaluable opportunity to attend a local school district meeting, which included school administrators, county administrators, state administrators, teachers, custodians, bus drivers, counselors, media specialists, parents, and community members. This district meeting gave each participant a chance to reflect on the current state of education as well as think about the future of learning as it pertains to students. As part of the discussion, participants were each charged to

recall a specific learning event that would be considered a peak learning experience, which happens when learning is motivational, self-directed, genuine, sometimes difficult, engaging, and lasting. Various personal examples were provided to help participants better understand and define peak learning experiences; it was very important for participants to try and recall such a learning event so that they would be able to identify the characteristics needed to simulate such experiences within the school. Participants worked in groups of eight to share a time when learning greatly impacted their lives in meaningful ways. The discussion was quite dismaying since over half of the group members could not recall a learning experience that fit the described criteria. For those few that could, each of their stories related to learning that had taken place outside of school. Many also noted the importance of new technologies, yet they did not often see current technologies used in the classroom. Upon reflection, many participants started to question why our schools so often fail to focus on intellectually memorable experiences that prepare students for the global society in which they live.

In spite of our demand-laden and curriculum cluttered environment, teachers must find time to consider what gets left out when we hurry to teach too many concepts and rush through each chapter in order to make sure students have been introduced to important concepts on the state standardized test. As educators, we need to recognize what our students need to become successful citizens in today's society, which often requires students to be critical evaluators of various types of information and requires them to become literate across a wide range of literacies.

In *To Understand: New Horizons in Reading Comprehension,* Keene (2008) describes working with teachers and students to help them structure academic environments that reach beyond literacy activities that simply require students to recall information but allow them to

foster true creative, intellectual engagement. She (2008) explains that learning should be a *lived* experience that allows learners to dwell in the mind where they can become captivated, engrossed, and fervent in their desire to understand; learning should allow students opportunities to truly experience their own intellect and should be the path for students to discover the joy of understanding. Keene (2008) points out that many educators rely on state standards to define understanding, and accordingly, literacy understanding is typically defined as being able to recall or retell what was read, answer literal and inferential questions, acquire new vocabulary, and retain and reapply concepts from various types of genres. While practices such as the implementation of performance standards do allow for application of concepts, many tests still require the basic recall of information. Since teachers and schools are held accountable for standardized test scores, teachers often teach in ways that are reflective of the test. However, Keene (2008) encourages educators to conceptualize understanding as a process that goes beyond explicit teaching objectives and allows students "not only to make connections or visualize, to synthesize or question, but also to *think* more effectively and with greater depth and insight, in a wider variety of books and genres, across disciplines, and in all aspects of their lives" (p. 12). Rosenblatt (1978) suggested that truly engaged readers are able to connect him/herself to his/her personal experiences, the text, and to other members of the reading community, which requires active reflection throughout the reading process. Mimi Ito (2010) describes how new technologies support "learning that is highly personalized and learner-centered, driven by passionate interest and social engagement" (para. 2). These technologies have the transformative power to further engage students in the reflective process as they read and respond to literature.

Educators have continually defined and redefined what it means to understand. However, the past few years have refocused efforts to try and stretch traditional understandings literacy in light of new technologies. The past few decades have flooded our society with new technologies and new forms of media, impacting traditional views of literacy and literacy learning. The Internet, along with up to date databases and real time communication applications, now provides teachers and students with information that was not previously available to them because of location and other restrictions. Advancements in information and communication technologies (ICTs) have radically changed the way we work, the way we play, the way we communicate, and the way we learn (Berry, 2011; Dillon, 2006; Harste, 2003; ICT Literacy Panel, 2002; Mills, 2010; Prensky, 2010). The International Reading Association (IRA) has recently noted the shift in literacy as it pertains to learning and has pointed out the importance of being able to effectively integrate information and communication technologies (ICTs) into current literacy practice and instruction (2009). From previous research studies, I understand that effective technology integration occurs when curriculum and technology tools are used to enhance learning in a content area. Integration is achieved when students are able to select technology tools to help them obtain information in a timely manner, that allow them to analyze and synthesize the information, and that support the presentation of information in a professional manner. The proliferation of new forms of information and communication technology (ICT) has resulted in a shift toward a much "wider range of symbolic elements" (Reinking et al., 1998). Consequently, engaging in literate activity today requires one to move beyond mere reading and writing to possess the necessary skills to critically evaluate potentially overt and hidden messages embedded in new forms of communication, as well as the requisite skills to access and

effectively use communication devices in basically every facet of life (Dillon, 2006; Harste, 2003; ICT Literacy Panel, 2002).

Unfortunately, and despite these critical findings, these newer understandings of literacy and the emergence of new technologies have had little impact on the culture of schooling as it relates to learning in many classrooms across the country. Prensky (2010) contends that, "The place where the biggest educational changes have come is not our schools; it is everywhere else *but* our schools" (p. 1). Yet, many educators would likely argue that some form of technology is often seen in many classrooms; the 21st century classroom is becoming popular as local school boards outfit learning environments with electronic whiteboards, computers, document cameras, and iPads. Each year, schools spend more money per student on technology then they did in previous years (November, 2010); yet, educators continue to teach in traditional ways and often view technology as a separate program or entity. Given that many educators have not found innovative practices that match the outside lives of students and that many of the skills the students are developing as a result of new technologies and ways of communication are seldom addressed in school, it is not surprising that high school dropout rates in the United States have stalled at 30% over recent years; however, the impact of dropping out of high school has new and unfortunate consequences in the 21st century (Berry, 2011; Darling-Hammond, 2010; Pew Internet and American Life Project, 2010). Many of today's students are dropping out of school not because they are performing poorly academically, but because they are bored (Berry, 2011; Pew Internet and American Life Project, 2010). Darling-Hammond (2010) reports that the effects of dropping out are especially harsh for students of color and those in households with low incomes, which is important to note since much of this research focused on economically disadvantaged students and their access to learning through technology. She states, "In the years

from 2001-2006, a 21-year-old high school dropout who was Black had less than a one-in-four chance of being employed full-time, and the odds for his White counterpart were less than 45%" (Darling-Hammond, 2010, p. 23). According to Kelly, McCain, and Jukes (2009), recent studies have identified that only "39% of 12th grade high school students believe that schoolwork will have any bearing on their success in later life, only 28% believe that schoolwork is meaningful, and a mere 21% believe that their courses are interesting" (p. 16). According to the Anytime Anywhere Learning Foundation (2011):

> We need to shift our thinking from a goal that focuses on the delivery of something – a primary education – to a goal that is about empowering our young people to leverage their innate and natural curiosity to learn whatever and whenever they need to. (as cited in Richardson, 2012, p. 26)

Not only is it critical that classroom teachers instruct students in the effective use of technology and the new literacies, but it is also important that teachers understand the impact that the technology revolution has had on economically disadvantaged students. The digital divide has come to describe various situations, but for the purpose of this study it describes the discrepancy in access to technology resources between socioeconomic groups. According to a recent study by the Corporation for Public Broadcasting (2003), while children from all income levels have greatly increased their Internet use, low-income students still lag behind other students in both home and school access. Further research posits that students from low socioeconomic backgrounds tend to have lower confidence in their ICT skills and fewer opportunities to develop their ICT skills compared to students from higher socioeconomic backgrounds (Vekiri, 2010). Beers (2004) points out that even though Internet access in

classrooms across the county is on the rise, having access does not mean that students are engaging with meaningful activities while using the Internet.

Many educational researchers have encouraged educators to question how schools operate in relation to the current technologies in society and to consider how the instructional practices used in classrooms either align or disassociate with the learning needs of digital natives (Ito, 2010; Leander, 2008; November, 2011; Russell & Plati, 2002; Trilling & Fadel, 2009). Additionally, it is important for teachers to understand the technology practices that students engage in while outside of the classroom. For instance, recent out-of-school research found that young adolescents largely use ICTs to play games, play music, text message and retrieve online content (Hundley & Shyles, 2010; Lin, Cheong, Kim & Jung, 2010; Luckin et al., 2009; Vekiri, 2009). Young children primilarly use ICTs to write, draw, create pictures, and play basic games (Selwyn, Potter, & Cranmer, 2009). Many educators are turning to research on educational technology as well as the new literacies to understand why many schools have failed to utilize the possible transformative power of technology to help build student awareness and support learning that is rich in dialogue, critical in nature, and allows students to discover the unique and dynamic possibilities of their own intellect. Graham and Perin (2007) describe the critical nature of equipping students for the 21st century environment:

> In an age overwhelmed by information…we should view this as a crisis, because the ability to…organize information into knowledge – can be viewed as tantamount to a survival skill because in the decades ahead, Americans face yet another challenge: how to keep our democracy and our society from being divided not only between rich and poor, but also between those who have access to information and knowledge, and this, to power – the power of enlightenment, the power of self-improvement and self-assertion, the

power to achieve upward mobility, and the power over their own lives to thrive and

success – and those who do not. (p. 2)

According to Hattie (2009), who conducted meta-analyses on over 800 achievement related

influences, computers and computer based learning are some of the most currently researched

topics. However, Hattie (2009) and Cuban (2001) state that, in many cases, computers have not

revolutionized the learning environment. Rosen and Salomon (2007) point out that current

assessment methods are not necessarily aligned with theories and practices of learning. The key

factor is that the integration of new technologies has not challenged the traditional relationships

of knowledge and pedagogy within the classroom (Cope & Kalantzis, 2010; Cuban, 2001; Berry,

2011). Cope and Kalantzis, (2010) further emphasize that, "We can use new technologies to

learn old things in old ways" (p. 88). According to Ito (2010),

The problem we are encountering today as educators is that we're living through a radical

paradigm shift in how people engage with and circulate knowledge, but our models for

teaching and learning, and our institutional accountabilities haven't kept up with the

world around us. (para. 20)

Recent local, state, and federal mandates, influenced by implementation of the *No Child*

Left Behind Act (NCLB), have challenged educators to continually raise student achievement

scores according to state and national standardized test measures. Reform efforts such as NCLB

and the more recent Race to the Top (RttT) have been specifically aimed at requiring schools and

districts to adopt various policies that, contrary to popular belief, may actually limit teacher

autonomy and focus on the acquisition of skills needed to pass standardized tests (Berry, 2011;

Cohen, 2011). In light of many of these accountability policies, core academic subjects such as

math and reading have received significant attention. Although reading comprehension has often been limited to recalling important information, the act of reading and the process of understanding have always been important, though varied, components of education; in light of recent reform efforts such as NCLB and RttT, literacy is quickly emerging as a means to measure student performance as well as overall teacher and school effectiveness (Georgia Department of Education, 2010b). According to Moje (2008), the last few years have seen "unprecedented attention given to literacy achievement of adolescents in the United States as spurred by the release of flat or declining reading scores on national tests" (p. 96).

Even with more attention being focused on literacy, educational researchers and authors Linda Christensen and Stan Karp (2003) assert that current educational policy, which is limited in scope and directly related to reform efforts such as the standardization of schools, greatly impacts the way teachers teach and what is taught. More specifically, Christensen and Karp (2003) contend that recent reform efforts have led to an educational environment that "…provides students with a dismal experience based on tests, tracking, and a sanitized curriculum that lacks credibility or sense of purpose needed to engage students or to connect with their communities" (p. 3). Hence, various reform efforts of standardization and accountability, including NCLB and RttT, control what is taught in classrooms across the country, and the teaching of reading and literacy is no exception (Christensen & Karp, 2003; Vinson & Ross, 2003). Accordingly, many students have not been given the opportunity to interact and engage with learning in ways to promote deep, intellectual learning (Berry, 2011).

Denise Pope (2001) has extensively researched students' perspectives of school. Through interviews, observations, and field notes, Pope (2001) echoes the sentiments of Christensen and

Karp (2003) in that many students do not identify school as a meaningful venue towards intellectual engagements; rather, Pope (2001) states:

> These students explain that they are busy at what they call 'doing school.' They realize
> that they are caught in a system where achievement depends more on 'doing' – going
> through the correct motions – than on learning and engaging with the curriculum. (p. 5)

The overreliance upon test scores and school rankings have led to classrooms that are based on "outcome-oriented teaching and learning, memorization and regurgitation of material, and a lack of deep understanding of the concepts being taught" (Pope, 2001, p. 165).

In addition, the current state of standardized testing and accountability policies have led to what Lipman (2003) describes as a pedagogy of powerlessness. Lipman (2003) states, "In sum, accountability measures, basic skills curricula, retention, and probation are both an explicit means of regulating students and teachers and a pedagogy that teaches people to adopt subordinated identities" (p. 92). These policies tend to be specifically aimed to control schools that serve low-income communities of color (Lipman, 2003). Hence, many classrooms operate in an environment of fear; teaching practices do not always reflect the ways that educators and theorists believe that students learn best (Lipman, 2003; Pope, 2001). Rather, the current state of education has greatly dictated how and what is taught in classrooms across the country (Christensen & Karp, 2003; Vinson & Ross, 2003).

Although many teachers have recently subscribed to implementing scientifically, researched based practices in order to improve student test performance, student achievement in the area of reading, according to standardized tests scores, remains poor, and further research has identified a noticeable gap between the performance of white, affluent students who tend to do

well on such test measures as compared to poor, minority students who tend to noticeably lag behind their counterparts (Kaplan & Maehr, 1999; National Center for Education Statistics, 2011). Intervention to assist lagging students must be immediate and is vital for student success. Students who enter middle school behind grade level are more likely to drop out of school, and without effective teachers, these students are not likely to make up missed ground in the future (Kaplan & Maehr, 1999).

With many students currently behind grade level, evidenced by poor performance on standardized tests, it is critical that we find innovative approaches to instruction that will foster intellectual engagement and allow students to construct knowledge of reading that is personal to their lives. It is time for educators to focus on the process of understanding rather than solely equipping students with recall skills to pass basic reading comprehension tests. According to Keene (2008), we can create the learning conditions to allow the depth and breadth of children's thinking to grow and change in ways that help them understand that their minds hold important ideas and to help them find the voice within. Steps to bridge the achievement gap and raise student reading scores are important for reasons other than performance; the Internet rich world that surrounds our students begs teachers to find methods and practices that encourage the use of various technologies to help understand different perspectives in order to make informed decisions.

Literacy instruction should involve teaching students to use more traditional literacies, such as print based texts, as well as literacies that are typical of the post-typographic age that have resulted from the emerging information and multimedia age (Semali, 2001). As these post-typographical texts have emerged, new literacies shaped our understanding of meaning. The new literacies describe how users develop the ability to read, write, comprehend, interpret and interact

with various types of media across numerous platforms (Hamilton, 2009). For the purpose of this study, new literacies were used to define new and emerging literacies that are both print based and digital; the new literacies encompass the multiple literacies with which students interact. With the onset of new and emerging technologies, the American Association of School Libraries (AASL) has redefined the meaning of information literacy: "Information literacy has progressed from the simple definition of using reference resources to find information. Multiple literacies including digital, visual, textual, and technological, now join information literacy as crucial skills for this century" (AASL, 2007, p. 2). AASL (2007) further asserts that learning in the 21st century must be grounded in a social context; "Learning is enhanced by opportunities to share and learn with others. Students need to develop skills to share knowledge and to learn with others, both in face-to-face situations and through technology" (p. 2).

In this study, I investigated how a fourth grade teacher along with the researcher designed discussion topics, assignments and tasks for a learning management system related to various literacy concepts and the ways in which the skills that support the new literacy practices were used by students as they responded to discussions or posts and as they created artifacts to share their learning Additionally, I examined how economically disadvantaged students reported access to and use of technology outside of the classroom.

Autobiographical Roots

In my experience, it is not all that surprising that many school policies and classroom practices are being dictated by student performance on national, standardized test scores and the continual challenge for schools and districts to make *Adequate Yearly Progress* (AYP). As a classroom teacher and media specialist, I have only had the opportunity to teach under the

constraints of such mandates. I know all too well the demands of following a pacing guide and ensuring that instructional lessons align with state standards and district curriculum maps. Unfortunately, I am familiar with teaching that is strictly dependent on district adopted text books and teacher guides to further "inform" my practice as a classroom teacher. Sadly, I have personally experienced how such teaching typically supports shallow, superficial understandings that ensure students have the basic skills to meet the minimal requirements of high-stakes testing.

When I first started teaching, I felt rather certain that I had a strong grasp of various educational issues and concepts as related to learning. I believed that my classroom was a safe and inviting place that set high standards for all students; in my opinion, my classroom was a place that allowed students to experience academic success that would support them throughout their learning. In my eyes, education was the key to helping all of my students to understand their potential and reach their dreams.

After teaching in a rural area for two years, I transferred to an urban school district and became the media specialist of a school that was over 90% African American, with 95% of students qualifying for free or reduced lunch. I constantly struggle to get students excited about reading as daily I encounter students who appear to be apathetic about school and display little passion for learning. I get so frustrated when I work to prepare a lesson that invites students to state their opinion about a specific topic or when I ask for student feedback about various assessments; however, I am most often met with blank stares. It seems that the students always want me to simply give them the answer; they appear to be more concerned with what I think than trying to figure out what they think. In the past, I would throw my hands up in frustration and plug away at the posted standards in order to prepare my students for the upcoming state

assessment. I would catch a glimpse, every now and then, of a student who wanted to share more or wanted to ask me a question that did not follow the "rules" of proper classroom etiquette.

When I heard my students talking at the lunch table or while waiting for the school bus, I heard many rich descriptions of their lives, but for some reason, my students either did not want or did not see the need to share their outside lives with classroom learning. I understand now that there are many variables at play that impact how students interact within a classroom, but I also believe that it is important to invite their lives – the good, the not so good, the happy, the sad, the clear and the confused – into the discussion of learning. As do many educators, I blamed lack of parental support and opposing cultural values, but my journey of learning and learning to understand has encouraged me to honestly confront my own beliefs and views of education.

Over the past few years, my perspective and understanding of the current educational system has been shaped and reshaped, questioned and confronted, defined and redefined. More specifically, my thoughts and beliefs have been challenged to consider both the overt and covert aims of education. Throughout my coursework, I have come to understand that my naïve perception of education as the great equalizer among race and class was not only misguided but deeply rooted in issues of social and political power.

According to Apple (1995), many educators are unaware and blind to the consequences, which include various types inequalities and control, of the current high-stakes testing environment in which we currently operate; Apple (1995) states,

> This [recognizing the patterned impact of hegemonic control] is especially difficult in
> education where an ameliorative ideology and the immense problems educators already

face leave little time for thinking seriously about the relationship between education practices and discourse and the reproduction of inequality. (p. 5)

Vinson and Ross (2006) further explain:

At bottom, high-stakes standardized testing, coupled with the publication of individual students', schools', districts', and states' scores, seek to legitimize certain dominant and dominating images of culture, knowledge, behavior, economics, and politics in an overall effort to discipline and enforce certain 'norms' consistent with the privileged interests of the wealthy and powerful. (p. 246)

Many educators are so focused on ensuring that their students perform well on state mandated tests that they do not fully understand how their teaching practices impact students. I think it is important to note that early teaching practices, especially in elementary school, can have a lasting impact on the future learning of students. As an elementary teacher, I want to light the fire of intellectual engagement so that students will be prepared to understand their learning and their world from a critical and honest perspective.

Statement of the Problem

Recent reform efforts such as the standardization of schools, NCLB, and Race to the Top have focused on creating effective learning cultures as a means of improving student achievement. However, such efforts have caused many teachers to teach in ways that are reflective of standardized tests. In addition, new and emerging technologies have greatly impacted students' lives inside and outside of the classroom. Although many schools have adopted new technologies, there seems to be a gap in how teachers can effectively integrate technology and new literacy practices while trying to meet the demands of reform to successfully

use technology to further students' thinking and investigations. As previously stated, effective technology integration allows students to learn in ways that are not necessarily possible with traditional teaching methods. In addition, effective technology integration gives students opportunities to learn not only within the physical structure of the classroom but also encourages them to extend their learning through their own ideas, the perspectives of others, and creates a culture of self-directed learning so that students are not solely dependent on the teacher's working knowledge of various subject matters. However, many economically disadvantaged students are not afforded opportunities to engage in self-reflective and directed learning; in addition, the digital divide further widens the gap for these students' learning that takes place outside of the classroom. Finally, effective technology integration requires teachers to help students understand the different types of technologies and how to manipulate them while learning. Students can then develop the necessary skills and dispositions to effectively engage in technology based learning communities and become effective users of information both inside and outside of the classroom.

In thinking about how students create and use knowledge, many researchers express a concern that knowledge in schools has often been pre-constructed and students are seen as recipients of knowledge rather than constructors (Anderson, 2008; Berry, 2011). However, the use of technology and the integration of the new literacies may be tools that can help to break down these pre-constructed constraints to support learning that is student centered and meaning to their personal lives. When given the opportunity to construct and share knowledge, what do our students do? Do students practice the use of new literacies? Do students strictly rely on teachers for answers and understandings? Do students us their own experiences to help form their understandings? When given the time and space, how do students use, if at all, the

experiences of others to shape their own perspective? A key focus of this research aimed to explore how economically disadvantaged students in a fourth grade classroom used various technologies and the new literacies such as posting, threaded discussion, blogging, and multi-model textual features embedded in a digital learning management system to apply their understandings and perspectives of various concepts related to literacy.

Research Questions

The purpose of this study was to explore how the effective integration of ICTs helps identify and develop the skills and behaviors to support the new literacies in a classroom of economically disadvantaged students and to better understand the opportunities for access to technology among these students.

Specific questions that guided this research study are:

1. What level of learning, as specified by Bloom's Taxonomy of learning, is supported in the design of on-line learning?
2. What new literacy skills are practiced by students as they engage in on-line discussions?
3. How does a digital learning management system facilitate interactions among students?
4. How do economically disadvantaged students access ICTs in informal environments?

Significance of the Study

Ultimately, students should have the greatest influence and responsibility in shaping the learning culture. Although the learning culture is an area that is commonly formed by teachers and school policies, it is critical to the success of students and their future learning. This study

explored how teachers can bridge the demands of a standardized curriculum, a time demanding instructional schedule, and the integration of technology and the new literacies to help economically disadvantaged students develop and share their learning inside and outside of the classroom in an urban elementary school in central Georgia. As a result, this study provides teachers with relevant information for future teaching strategies and provides teachers with a different avenue to meet the individual needs of the students.

Many demands are placed on classroom teachers, and as a result, they often leave the profession due to stress and frustration, which is sometimes due to the various mandates and policies that stifle their creativity and autonomy (Berry, 2011). This study could be useful to professional learning communities among school professionals to prepare and support classroom teachers who struggle to find ways to effectively integrate technology and help prepare students for the new literacies. It could provide them with information that can be used to revise or supplement their understandings of how technology impacts minority students and how literacy instruction can be expanded beyond traditional print.

As a passionate media specialist, the researcher found this study to be very helpful as the researcher worked to mediate the curriculum and instructional needs of teachers and the learning needs of students. The researcher was interested in deepening her current level of understanding of how to integrate technology in ways that support both student centered learning and state mandates such as the Georgia Performance Standards and the anticipated Common Core Standards. More importantly, the researcher sought to understand how the economically disadvantaged students whom the researcher serves are impacted by the digital divide. The results of this study helped the researcher to make more informed decisions about the use of technology in schools that have a high percentage of disadvantaged students as well as the new

literacy skills that students currently use or the ones that emerged through the integration of technology in the classroom.

Finally, this study provides the classroom teacher who participated in this research with information regarding her instructional behaviors as they relate to levels of thinking when expecting students to apply newly learned literacy concepts as well as how students engage with others throughout the learning process. This study contributes to the ongoing research that examines how technology can be used in the classroom and its impact on minority students. As a result of the findings from the study, further research may evolve, especially from researchers who are interested in conducting similar studies in other regions.

Limitations

This study was delimited to fourth grade teachers and economically disadvantaged students in one elementary school in Central Georgia. Furthermore, the case study focused on six economically disadvantaged students that have shown achievement in literacy through teacher reported grades and interest in technology projects through club activity or teacher recommendation. Additionally, digital data for this study was delimited to information shared on the learning management system (LMS).

Definition of Terms

The following terms have been defined for the purpose of clarity in the presentation of this study.

Asynchronous discussion – Electronic communication where postings/threads accumulate over time; not all participants have to be gathered at the same time. Discussions can take place over a period of time (Grisham & Wolsey, 2006).

Blog (Web log) – A website in which journal entries and personal headlines are posted on a regular basis and are of interest to the user; commonly consists of hypertext, digital images, and hyperlinks (McKenna, 2006).

Digital divide – The gap that exists between individuals with varying socio-economic, attitudinal, and geographic levels of access to information and communication technologies (McKenna, 2006).

Digital Learning Management System – Web-based technology used to plan, implement, and assess a specific learning process. Typically, a learning management system provides an instructor with a way to create and deliver content, monitor student participation, and assess student performance. A learning management system may also provide students with the ability to use interactive features such as threaded discussions, conferencing, and discussion forums (Salavuo, 2008).

Information and communication technologies (ICTs) – Information technology that supports communication and information sharing through digital access (Leu, et al., 2004).

Message board - Data systems that allow users to share information over a period of time; message boards also allow users to share posts (Roblyer, 2004).

Multi-modal – The integration of multiple ways of knowing and multiple modes of communication including text, images, art, music, drama and technologies (Mills, 2010).

New Literacies – The new literacies of the Internet and ICTs describe how users adapt skills and strategies to effectively use information as technologies impact how information is used and shared (Leu, et al., 2004).

Post – The act of posting a message on an online message board (Wolsey, 2004).

Threaded discussion - An asynchronous discussion or conversation taking place in an on-line community that allows users to view and comment on different users posts (Wolsey, 2004).

Summary

Research has shown that many classrooms across the county are not fostering a culture of learning that supports the needs of 21st century learners. Furthermore, research shows that the new literacies are critical to developing students that are literate across a broad range of contexts and functions. However, little research has been conducted to identify how teachers who work during a time of standardized curriculum and rigid accountability policies have been able to offer instruction to elementary, minority students that nurture and utilize new literacy practices. By conducting this study, the researcher was able to provide insight to the body of existing literature on economically disadvantaged students and their use of the new literacies as well as their access to and use of the Internet in informal environments.

CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

In an effort to create a learning environment that supports students' personal understanding, deep questioning of meaning, and critical thinking, I have drawn upon a variety of research that is related to knowledge production, the new literacies, critical literacy and 21st century learning. In addition, three major bodies of research, constructivism, critical literacy, and emergent theories of new literacies, inform my theoretical perspective as a learner, teacher, and researcher. The convergence of new technologies makes it difficult to understand learning from one theoretical standpoint. According to Bonk (2009), "We are emerging from an age when prevailing theories helped us understand and utilize learning technologies, though often unsuccessfully, to a time when technologies are part of a much more complex learning environment" (p. 356). The aforementioned theories and research provide the framework and perspective needed for educators to better understand learning and teaching in the digital age; furthermore, these theories embrace the need for classrooms and instructional practices to meet the needs of learners in ways that are relevant to students' lives and encourage meaning making, innovative approaches to information literacy integration, and the power of social learning that are an essential element of evolving information literacy concepts.

Over the history of education, there have been many reform efforts impacting how and what is taught in classrooms across America. The aims of teaching have shifted over time from moral and character education, to teaching for an industrial society, to offering standardized curriculum and instruction, and to teaching for a knowledge society (Berry, 2011; Christensen &

Karp, 2003; Kridel, 2009). If educators want to truly impact the lives of our students and make learning a meaningful event that will continue to excite them inside and outside of the classroom, we must start to consider not only what we teach but also how we teach, and in the context of educational technology, we must question how students use technology rather than whether or not they use it in schools (Berry, 2011; Cuban, 2003; Hargreaves, 2003; Hull & Schultz, 2001; Lam, 2000; Lemke, 1998; O'Dwyer, Russell, Bebell, & Tucker-Seeley, 2005).

Issues of pedagogy have been embedded in teacher education programs, professional development initiatives, and instructional improvement plans throughout the recent history of schooling and education. Educators have long understood that how we teach is just as important as what we teach (Berry, 2011; Cuban, 2003; Friedman, 2006; Hargreaves, 2003; O'Dwyer, Russell, Bebell, & Tucker-Seeley, 2005). Friedman (2006) stated that "*how* we educate our children may prove to be more important than *how much* we educate them" (p. 302). Unfortunately, the lives and cultures of learners today have changed more rapidly than the pedagogical methods in most classrooms and schools across America (Berry, 2011; Goldberg, Russell, & Cook; 2004; Hull & Schultz, 2001; Lam, 2000; Leander, 2008). The following review of literature presents three theoretical underpinnings, which are constructivism, critical literacy, and the emergent theory of the new literacies; in addition, I have presented timely research on how technology has impacted learning and factors related to teaching students in the 21st century. Additionally, I describe relevant research studies, both qualitative and quantitative, that have attempted to better understand the relationship between literacy and ICTs in institutional and informal learning environments.

Constructivism

"How do we help each teacher envision a future for his or her students that is not pathological?" (Ayers & Ford, 1996, p. 326). As a passionate educator, Ayers has worked to address the many inequalities embedded within the context of schooling, many of which have developed from pressure for schools to produce better student test scores (Berry, 2011) . Teaching is more than state mandated tests, and the heavy influence of political ideology in schools has narrowed students' opportunities to develop complex literacies (Christensen & Karp, 2003; Cummins, Brown, & Sayers, 2006; Knobel & Lankshear, 2006; Paugh, Carey, King-Jackson, & Russell, 2007). Educators are charged with helping each student discover their intellectual ability and the joys of learning; however, many classrooms have not been able to create models of learning, especially literacy learning, that encourage negotiation, collaboration and innovation (Dyson, 2003; Keene, 2008).

Theories of constructivism assert that students learn best when allowed to construct their own knowledge and information in ways that are meaningful to them (Fosnot, 1996; von Glasersfeld, 2005). The theoretical framework of this study is based on a belief that knowledge or "knowing" is the result of a "constructive" process through which learners develop their own understandings; from this perspective, the meaning making behaviors that are investigated in this work and in previous related research are intrinsic to a constructivist theoretical framework (Fosnot, 1996).

In constructivist terms, knowledge is not created in a vacuum but it is greatly impacted by students' social and cultural environments (von Glasersfeld, 2005). Constructivist theorists argue that students should be given various experiences in which they can construct knowledge rather than being passive recipients (Gredler & Shields, 2010, Schunk, 2012), and through interaction, exploration, equilibration, and scaffolding of knowledge construction within the social world,

learners construct meaning throughout these processes (Bruner & Ratner, 1978; Piaget, 1977, Vygotsky, 1986). In other words, knowledge is not something that teachers simply impose on students, but knowledge is formed within the learner in relation to their experiences, prior knowledge, and lived reality (Bruner & Ratner, 1978; Schunk, 2012; von Glasersfeld, 2005). According to von Glasersfeld (2005) and Cambourne (2002), one of the basic premises of constructivism is that knowledge is related to the environment in that it is understandable and shaped by the students' perspective; one of the major setbacks in many classrooms is that teachers assume and infer that students will construct knowledge with little to no guidance. However, the learning environment is greatly impacted by numerous issues including social, cultural, and historical factors. von Glasersfeld (2005) reminds educators that, "When we intend to stimulate and enhance a student's learning, we cannot afford to forget that knowledge does not exist outside a person's mind" (p. 5).

In particular, this process of exploration is present in literacy. As children interact with literacy events, whether they are print, multiliteracies, numeric, or technological, they construct hypotheses about the function and purposes of the literacy. Learners come to understand that "learning language is learning how to mean" (Goodman, 1984, p.102). Immersed in literate events, children come to appreciate that they can make sense through the use of literacy.

When teachers allow students to use technology in ways that support their understandings, encourage deep, critical questioning, and work to construct their own ideas of concepts, the schooling environment becomes more supportive of students' needs, interests, and learning (Anderson, 2008; Rosen, 2010). Two important studies, SITES and TLC, have related instructional methods embedded in constructivist theory and the use of technology and innovative pedagogical practices (Becker, Wong, & Ravitz, 1999; International Association for

the Evaluation for Educational Achievement, 1999). Through various quantitative and qualitative

collection methods, these studies identified that (a) teachers with constructivist beliefs are more

likely to use new media in their teaching methods and investigate innovateive practices for

implementation and (b) innovative pedagogical practices through new media and ICTs often

engaged learners in activities and experiences that were considered knowledge management

where students were involved in the construction of knowledge (Anderson, 2011; Becker, Wong,

& Ravitz, 1999; International Association for the Evaluation for Educational Achievement,

1999).

In studying educational technology and constructivism, Papert (1998) adapted the

constructivist perspective and applied it to children engaged in the use of technology. The result

was a rich learning environments that was associated with a programming language, Logo. In

this particular environment, students were given LEGO building blocks to construct machines.

The machines were then connected to computers and students were able to write a program

through the previously described programming language that allowed the machines to move

(Sargent, Resnick, Martin, & Silvermann, 1996; Resnick, Ocko, & Papert, 1988). The National

Association for the Education of Young Children (2003) acknowledged that software for young

children should be implemented as an active agent for learning and extending children's learning

abilities and such technology supports constructivist theory. Additionally, the National Council

of Teachers of English (2008) issued a position statement addressing multi-modal literacies,

which stated that young children are sophisticated readers and producers of multi-modal work;

they should be given various learning opportunities to frequently engage in these new literacies.

For instance, many studies support the use of electronic books, including CD-ROM storybooks,

and story avatars to help students construct meaning by making connections between the story

development as well as between the characters and plot (DeJong & Bus, 2004; Lefever-Davis & Pearman, 2005; Liu, Liu, Wang, Chen, & Su, 2012). Larson (2010) qualitatively studied how students use technologies such as digital readers to help them respond, connect, and share literacy experiences in a digital format. The students used the digital readers to record many of their ideas and thoughts throughout the reading process as they made various connections among story elements as well as their personal lives (Larson, 2010). Furthermore, she discovered that the students' use of note taking could be grouped into five main types of responses that relate to the construction of meaning:

1. Understanding of story (retelling; personal commentary)

2. Personal meaning making (text-to-self connection; character identification)

3. Questioning (desire for information; indication of lack of understanding)

4. Answering (answers to questions in the text)

5. Response to text features/literary evaluation (Larson, 2010, p. 18)

As previously described, the innovative uses of new media, the Internet, and ICTs have great implication for education; Friedman (2006) describes:

It is now possible for more people than ever to collaborate and compete in real time with more people on more different kinds of work from more different corners of the planet and on a more equal footing, than at any previous time in the history of the world. (p. 8)

Recent shifts in technology have led to an environment in which students have numerous opportunities to share real life events in real time with others in a global society; the current culture of learning is being challenged in the face of new and emerging technologies (Berry, 2011; Darling-Hammond, 2010; Friedman, 2006; Luckin et al., 2009; November, 2010).

Information is vast and readily available for students; hence, learning is no longer contained within a classroom and reliant on the teacher's working knowledge of a subject matter (ICT Literacy Panel, 2001). Rather, various studies have shown that learning can take place in a variety of places, across many different contexts, and is more dependent on the students' sharing of ideas and experiences rather than on sole reliance of the teacher (Ciardiello, 2004; Forbes, 2004; Jacobs, 2004; Lewis & Fabos, 2005; Salavuo, 2008). Prenksy (2010) asserts that the new pedagogy of learning in a 21st Century classroom is dependent on students' use of technology to help build their knowledge, which is in contrast to many traditional classrooms where teachers serve as the gatekeeper of knowledge (Barry et al., 2011). According to Prenksy (2010) the emergent reality for teachers is changing: "The teachers' job [in the 21st Century classroom] is to coach and guide the use of technology for effective learning" (p. 3).

The opportunities of learning and sharing from one's own perspective, as well as through the perspective of others, support the ideals of constructivism. As previously stated, constructivism is grounded in the basis that our world is socially constructed; therefore, knowledge is closely related to the constructs previously determined. Digital students are immersed in technology and their environments are constructed through information and communication technologies (ICTs) (Leander, 2008; Warschauer, 2008). Some researchers refer to the consumption of technology as being "wired" or "connected, especially to the Internet" (Rosen, 2010, p. 27). Digital students have been coined as the iGeneration; these students were born in the late 1990s and in the new millennium and make up the first generation of truly cyber-savvy children (Rosen, 2010). According to Rosen (2010), iGeneration students, on average, spend more than 5 hours a day with media; many students are already using technology to help them identify important information in order to read, understand, socialize, communicate, and

create (Rosen, 2010). Yet, we expect them to lose these identities when they enter the traditional classroom (Berry, 2011; Leander, 2008; Russell & Plati, 2002). Jones (2005) investigated similar issues in the lives of students in Hong Kong; his investigations were centered on the idea that Hong Kong schools were not related to the outside lives of students and their "wired" culture (as cited in Leander, 2008).

While many educational policies frame teachers as transmitters of knowledge and students as disengaged recipients, many students of today have already become active learners outside of the classroom as they respond to posts on networking sites with friends in their local community and acquaintances that live in other states and countries, read books in an e-format on their mp3 player with the capability of taking notes within the text, author stories through online sites, and create wikis and blogs that follow their daily lives or a specialized area of interest. Unfortunately, Rosen (2010) points out that many school policies and regulations do not support a pedagogy of constructivism: "What is different is that so much of what kids are learning about is how to use media, manipulating information, and finding things online are taking place in an informal social context, rather than things they are learning in school" (p. 38).

According to Schunk (2012), constructivist classrooms support learning that is not solely teacher directed but dialogical in nature where teachers learn with and from students when making instructional decisions. The vast amount of information in various forms that is readily available to students through the open access posited through the use of ICTs has the potential to encourage students to think in ways that support multiple viewpoints, identify material that is of personal interest and relevant to their lives, and think about different ideas impacting their lives (Berry, 2011; Insinnia & Sharecki, 2004; Jacobs, 2004; Leander, 2008; Lewis & Fabos, 2005; Rosen, 2010).

A Sociocultural Perspective. Constructivist theorists assert that social interactions provide valuable and crucial opportunities for students to build higher mental processes, and one additional area of constructivism that supports 21st century learning is associated with peer and social learning (Vygotsky, 1986; Street, 1984). Technologies such as blogs, wikis, Skype, and social networking sites offer students the opportunity to learn with and from one another (Insinnia & Sharecki, 2004; Jacobs, 2004; Lewis & Fabos, 2005; Rosen, 2010). Students of today are immersed in social networks, and despite a lack of face to face interaction, they continue to engage in meaningful communication with friends and peers (Berry, 2011; Rosen, 2010). Prensky (2010) reports that students claim that the most engaging activities during their classroom learning involve group work, discussions, and the sharing of ideas among other students. Insinnia and Sharecki (2004), Lewis and Fabos (2005), and Watson and Lacina (2004) describe how instant messaging, on-line chatting, and threaded discussions were used to support student learning and development while applying the components writing, comprehension, and social development with intermediate age students. These studies describe how students had opportunities, through the use of technology, to learn from the work and ideas of peers as well as from the feedback from teachers and peers, and one important finding among these studies was that students adjusted their ideas and writing as they interacted with feedback and dialogue with peers and teachers with computer mediated communication (Insinnia & Sharecki, 2004; Lewis & Fabos, 2005; Watson & Lacina, 2004). Constructivism encourages students and teachers to confront how their own ideas have been shaped from the world around them and how they can develop new thinking when confronting these ideas and shaping their perspective through the voices of others (Kincheloe, 2008).

As students interact with their environment, which is rapidly changing with the advent of new ICT's, students have the opportunity to develop their cognitive ability and continually shape their understandings of various concepts. Various research studies have documented how discussions through computer mediated communication increased collaborative learner-to-learner and learner-to-teacher exchanges and facilitated the negotiation of meaning process (Kern, 1995; Sullivan & Pratt, 1996; Warschauer, 1996). Russo, Watkins, and Groundwater-Smith (2009) examined the ways in which social networking impacted learning in less formal environments such as museums and libraries. This particular research posits that using social networking media is beneficial to learners because it tends to make them active participants in the learning process as they inquire and collaborate with others. Russo, Watkins and Groundwater-Smith (2009) further found that informal learning environments such as museums, libraries and galleries offer an innovative "and effective role for social media to play in creating authentic learning experiences based on social networking and informal knowledge sharing" (p. 164). Ray, Lanfestey, and Smith (2006) found that innovative uses for blogs in education, often called "edublogs," are growing as teachers discover creative ways to implement new technologies that promote literacy and response journals that allow students to share with others across various platforms and spaces. Kajder and Bull (2004) studied how one teacher used blogs as an electronic form of reader response and as a space for students to reflect on readings and literature discussions. Kajder and Bull (2004) found that students typically wrote more when responding to an electronic response journal via a blog and that students were seen as authors that were able to develop and "come into their own" as writers as they shared feedback between each other and the teacher (p. 32).

Children need social environments and various interactions to develop their capabilities and potential abilities; students are better able to learn within a social context what they cannot achieve in isolation (Lave & Wegner, 1991; Sefton-Green, 2004; Vygotsky, 1978). Much of the reviewed research expressed the idea that students of today have open access to various types of information and the traditional hierarchy of knowledge has been challenged and uprooted (Anderson, 2008; Friedman, 2006; Ito, 2010). As described by the Digital Youth Project, many of the youth practices point to the idea that students are relying on experienced peers and other content specific experts for information rather than simply turning to traditional authority figures such as teachers (Mills, 2010). In some cases, students participated in self-directed learning and turned to peers when they experienced challenges along the way or had reached the limits of their working knowledge (Mills, 2010). Berry (2011) identified interest and peer driven practices as key emergent realities among young students; ICTs and supportive environments provide for "a transformed learning ecology for students and teachers whereby digital tools provide a surfeit of choices for instant and accessible information, communication, and self-expression" (p. 17). Luckin et al. (2009) studied the ways in which students use 21st century technologies and found four complex categories of usage that include researchers, collaborators, producers, and publishers. Findings suggest that students often use the Internet and related ICTs to research and collaborate with peers; often times, collaboration takes place as students turn to "expert" peers to learn new manipulations of ICTs (Luckin et al., 2009).

Applications and Deep Understandings. Both constructivist and reader response theory support the belief that meaning is constructed by the learner and is unique to the context and individual experiences (Rosenblatt; 1978; von Glasersfeld, 2005). Readers Workshop is a common literature-based approach to teaching reading in elementary classrooms which allows

students to experience and discuss different types of literature and literature concepts through independent, small group, and whole group activities (Atwell, 1987). Two important components of an effective reading workshop are the use of literature response journals and project response options (Atwell, 1987). These instructional strategies give students opportunities to actively reflect on literature with an emphasis on making personal connections and making meaning within the text as well as offer students a variety of ways to share their learning through various types of project based assessments (Atwell, 1987). While traditional methods for journaling and assessing rely on paper, pencil, and writing as the primary mode of sharing understandings, current ICTs have changed the nature of journaling and project based assessments (Dutro, 2009; Watson & Lucina; 2004). However, it is important to note that the design of response projects greatly impacts the level of thinking required by students.

Levels of Learning. The rigor, depth, and breadth of journaling, creating discussion posts, and project based assessments are based on various types of criteria; for the purpose of this study, journaling, discussions, and project based assessments were aligned with Bloom's taxonomy of learning to determine the complexity of the task or discussion and the level of application that is expected through teacher designed discussion topics (Churches, 2014; Overbaugh & Schultz, n.d.). Benjamin Bloom was an educational psychologist that helped to develop a classification of levels of cognitive behaviors important to learning (Anderson & Krathwohl, 2001). Bloom developed a continuum of learning that describes the thinking process and specifies lower level thinking skills that increase to higher order thinking skills. In the past two decades, the original taxonomy was revisited by students of Bloom, whom updated the taxonomy to reflect 21st century learning; the change shifted the original nouns to verbs and exchanged the top levels of thinking (Anderson & Krathwohl, 2001; Churches, 2014; Overbaugh

& Schultz, n.d.). When applying the taxonomy of learning model, one must consider the context of the verb and the various skills that must be present for a student to effectively complete a task or discussion (Churches, 2014; Overbaugh & Schultz, n.d.). The following graphics identify the original and revised continuums of learning; the bottom of the pyramid identifies lower level thinking skills and the skills increase in complexity:
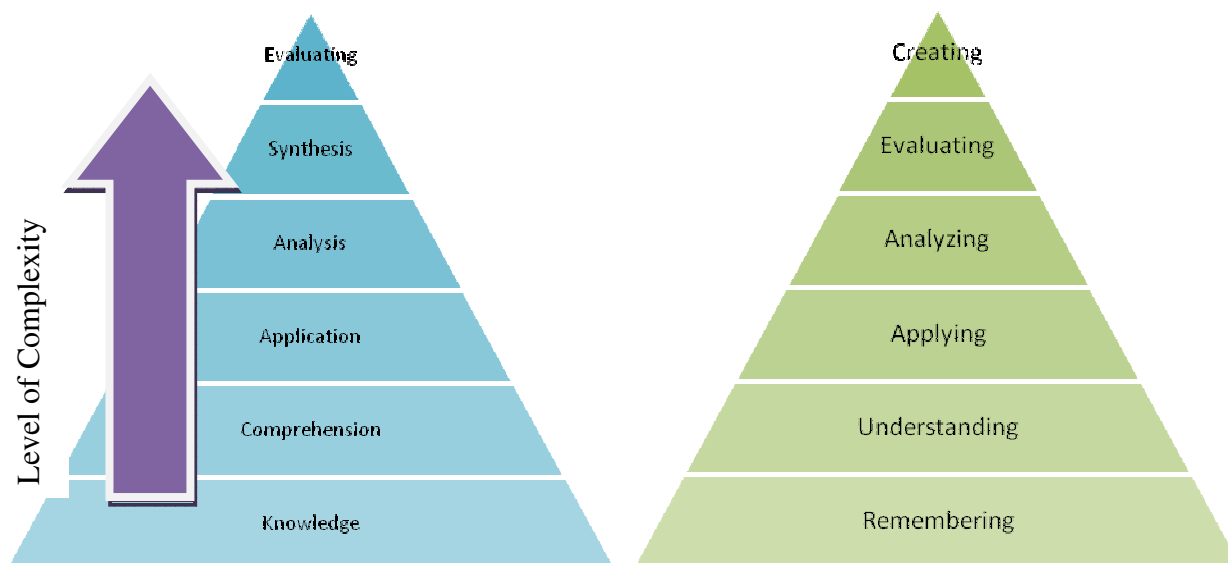
Figure 1. Bloom's Taxonomy. This figure illustrates the level of cognitive learning in the old and new version of Bloom's taxonomy (Churches, 2014; Overbaugh & Schultz, n.d.).

There are various levels of cognitive complexity within the taxonomy. The higher levels of learning relate to theories of constructivism in that students are expectedly to be actively engaged in assessing, contrasting, critiquing, connecting, creating, analyzing, and designing whereas lower levels require tasks that are less related to constructivism such as naming, stating, recalling, recognizing and defining (Overbaugh & Schultz, n.d.). The lowest level of learning, or the level that requires the least amount of cognitive engagement, is remembering, which requires a learner to recall or recognize knowledge from memory. According to Churches (2014), "Remembering is when memory is used to produce definitions, facts or lists, or recite or retrieve

material" (p. 1). The next level of learning complexity is understanding, which requires slightly more cognitive involvement than remembering. At this level, learners are expected to make meaning from different ideas or concepts; as the level of cognitive complexity increases, learners should be able to apply previously learned information so that they use the learned information in new ways and in new contexts (Churches, 2014; Overbaugh & Schultz, n.d.). As the level of cognitive complexity increases students are expected to analyze, evaluate, assess, construct, differentiate, hypothesize and plan. The highest levels of complexity are related to students being able design, create, prove, connect, and synthesize a variety of information; tasks at this level are deep and complex and require higher order thinking skills (Churches, 2014; Overbaugh & Schultz, n.d.) Understanding the different levels of cognitive complexity is important when analyzing discussions, assignments, and tasks created by teachers to determine the level of difficulty and level of thinking needed to complete the task. In addition, it is important that teachers offer students a variety of activities at the different levels to ensure they have a strong understanding of a concept so that they can effectively complete tasks that require higher order thinking skills. According to Au (2006):

> Technology projects seem to work best when they present students of diverse backgrounds with challenging, generative tasks that require them to read, write, and think in new and demanding ways. The time, energy, and thought students devote to participate effectively in these projects suggest that they are readily able to take advantage of constructivist forms of instruction that give them the knowledge and strategies needed to engage with new forms of literacy and electronic media. (p. 366)

Throughout this research project, the investigator worked to understand how teachers design both discussion topics and response projects with a learning management system according to

Bloom's taxonomy of learning to better understand how these activities support the construction of meaning.

Critical Literacy

> Of all the civil rights for which the world has struggled and fought for 5,000 years, the right to learn is undoubtedly the most fundamental…The freedom to learn…has been bought by bitter sacrifice. And whatever we may think of the curtailment of other civil rights, we should fight to the last ditch to keep open the right to learn, the right to have examined in our schools not only what we believe, but what we do not believe; not only what our leaders say, but what the leaders of other groups and nations, and the leaders of other centuries have said. We must insist upon this to give our children the fairness of a start which will equip them with such an array of facts and such an attitude toward truth that they can have a real chance to judge what the world is and what its greater minds have thought it might be. (DuBois, 1970, p. 230-231).

Literacy and the act of reading have been important components throughout the history of education. According to Temple, Ogle, Crawford, and Freppon (2008), "Teaching children to read not only gives them access to knowledge from print, but it also makes them better able to use that knowledge" (p. 3). Reading is not limited to decoding and recalling specific information from texts. The ability to read forms the foundation for literacy, and literacy can help students to think in profound and sophisticated ways; literacy in schools should serve as the building blocks to help students judge the world (Heath, 1983; Hull & Schultz, 2001; Street, 1984; Temple, Ogle, Crawford, and Freppon, 2008). However, as educators we must be willing to challenge

traditional discourses of literacy to better understand how we use language to convey meaning (Gee, 1996; Heath, 1983; Street, 1984). According to Shor (1997),

> Literacy is understood as social action through language that develops us as agents inside a larger culture, while critical literacy is understood as 'learning to read and write as part of the process of becoming conscious of one's experience as historically constructed within specific power relations. (para.1)

Recent literature on critical literacy has developed my view that critical literacy encourages us to redefine our own understandings as we question power relations and social constructions embedded in literacy (Gee, 1996; Heath, 1983; Shor, 1997; Street, 1984). In education, the notion of critical literacy has been used to describe ways of teaching and the use of literacy that aims to raise awareness and to support the discourse as to how everyday lives and actions are constructed and constrained through the apparatus of power (Freire, 1985; Street, 1984; Heath, 1983). Reading is more than being able to call a word; reading is inherently linked to being able to understand who we are and how we have become what we are (Freire, 1985; Shor, 1997).

According to Rosenblatt (1978), reading is a deeply personal experience as readers interact with text and apply past interaction with new text and new personal experiences. Meaning is experienced as readers bring their personal understandings and prior experiences to text. According to Larson (2007), "Meaning becomes real when readers are encouraged to transact with literature, emphasizing that meaning does not necessarily exist in a prefabricated state within the text or within the reader, but takes form during the transaction between reader and text" (p. 40). Traditional conceptions of literacy are limited to the ability to read, write, communicate and comprehend, but in order for readers to extract true meaning, they must be encouraged to question and contemplate the values embedded in the works, both traditional and

digital, they encounter. Recent technologies such as social networking have provided a platform to allow users to share their understandings of how mainstream norms and beliefs are shaping them (Burnett & Merchant, 2011; Hagood, 2000; Warschauer & Ware, 2008). Technology will play an important role in helping us to define our lives and our world (Burnett & Merchant, 2011). According to Lamb (2011), "Digital age technologies have made such an impact on the way we interact with content that the old definitions of reading and books no longer apply" (p. 13).

As previously stated, literacy has been defined in many ways, and the definition is constantly evolving and changing as our society finds new and innovative ways to communicate. Coiro, Knobel, Lankshear, and Leu (2008) define literacy as "…socially recognized ways of generating, communicating and negotiating meaningful content as members of Discourses through the medium of encoded texts" (p. 249). New literacies emphasize the critical use of digital technologies along with traditional texts as part of our socio-cultural and historical past, present, and future; furthermore, many literacy educators and researchers promote these communicative technological devices as an open source of thinking for further discourse (Coiro, Knobel, Lankshear, & Leu, 2008; New London Group, 1996; Thomas et al., 2007). Hence, the idea of new literacies has become a prominent idea in the discussion of literacy and learning. Thomas et al. (2007) defines the new literacies as "…the ability to read, write and interact across a range of platforms, tools and media from signing and orality through handwriting, print, TV, radio and film, to digital social networks" (para. 3). Thomas et al. (2007) point out that the new literacies are not focused on defining what types of materials constitute media but encourages a perspective of "all literacies relevant to reading, writing, interaction and culture, both past and present", which helps to ground the new literacies in a critical literacy context (para. 5). Thomas

et al. (2007) further argue that the new literacies "offers a wider analysis of reading, writing and interacting across a range of platforms, tools, media and cultures"; moreover, the new literacies are not a behavior that replaces or redefines literacy but rather encompasses the practices of various types of literacy" (para. 10). The new literacies are subjective, complicated and work to bring together all of the literacy modalities including print and digital while working to understand the roles these literacies have played in the past, continue to shape the present, and will define the future (Thomas et al., 2007). Thomas, et al. (2007) describes the complexity of the new literacies; he states that new literacies act to help us better understand ourselves and can be seen through different contexts:

> …transliteracy [new literacies] as a cultural phenomenon, and as a lens through which to examine society and culture. On one hand, it is the kind of literacy we require to be able to simultaneously attend to multiple media and modes of communication: the literacy of the 'trans'. On the other, it also refers to that kind of literacy we use to apply the literacies of one mode or medium to another one: transliteration. This dual nature of transliteracy [new literacies] implies that it can be employed to understand communication both diachronically (over time) and synchronically (at the same time). Diachronically, it helps us understand, for example, how the practice of blogging might draw upon non–digital methods of combining modes in handwritten media or how personal blogs relates to diaries and journals. Synchronically, it can help us see how multiple media and modes of communication are used in relation to each other at the same time. (para. 34)

As literacies continue to evolve, our instructional practices must also change to reflect the dynamic understanding of literacy (Ciardiello, 2004; Dutro, 2009; Larson, 2007). According to Larson (2007), "Reading instruction, along with the broader notion of literacy instruction, are

undergoing tremendous transformations as new technologies demand new literacy skills to effectively employ their potentials" (p. 3). The notions of literacy as well as the idea of new literacies continue to be shaped by the digital age and the emerging roles of technologies such as the Internet and other information and communication technologies (ICTs). Mills (2010) further asserts, "Digital communication has transformed literacy practices and assumed great importance in the functioning of the workplace, recreational, and community contexts" (p. 246). Critical literacy charges us to understand how literacy practices shape these contexts. Noted media educational researcher Henry Jenkins (2006) studied how new technologies support learning a participatory culture of learning, which supports theories of socially mediated learning and opportunities for discourses of meaning.

New media and new literacies have brought to light the need for students to be critical users of information. With the onset of new and emerging technologies, the American Association of School Libraries (AASL) has redefined the meaning of information literacy: "Information literacy has progressed from the simple definition of using reference resources to find information. Multiple literacies including digital, visual, textual, and technological, now join information literacy as crucial skills for this century" (AASL, 2007, p. 2). AASL (2007) further asserts that learning in the 21st century must be grounded in a social context that fosters a participatory culture, which is supported by many of the new ICTs; "Learning is enhanced by opportunities to share and learn with others. Students need to develop skills to share knowledge and to learn with others both through experience with face-to-face situations and through technology" (Kelly, McCain, & Jukes, 2009, p. 2).

According to Burnett and Merchant (2011), literacy has already been defined through the instructional practices and curricula used in schools throughout our country. Literacy education

today has an important focus: '"You will learn literacy in a certain way because that will enable you to read/write in a way that reflects who we think you should become" (Burnett & Merchant, 2011, p. 55). However, critical literacy posits that individuals can challenge traditional views of literacy and literacy education so that students develop the ability to position themselves in ways that give them some control and an avenue for engaged participation. New technologies can support educators to help students identify the unevenness of participation and allow for a new agency of thought and understanding (Burnett & Merchant, 2011). Burnett and Merchant (2011) note that new literacies supported through a social context allow users to "…re-mix or re-contextualize available resources to reflect both dominant global discourses and more immediate local contexts" (p. 45).

In thinking about how literacy shapes our understandings, Keene (2008) describes the ways in which many classrooms teach cognitive strategies of understanding that support surface structure systems, which are "a set of skills that help readers/writers identify words and read fluently" (p. 33). However, if educators want students to experience intellectual engagement with text, they need to explicitly teach deep structure systems, which are a set of skills and strategies that help readers/writers comprehend to grasp plot, comprehend to question character motives, comprehend deeply to probe ideas, and extend and apply their understanding. Several key features enable a teacher to understand the type of structure system a student uses. When students are working with deep structure systems, they are able to create relevant background knowledge, make inferences, create sensory and emotional images, determine importance, question, analyze, and synthesize (Keene, 2008). With limited time and too many demands, teachers do not often encourage the use of deep structure systems; however, many students are using deep structure systems as they interact with new technologies through the creating and

sharing of content (Rosen, 2010). If students are given the digital space and time and supported

through teacher designed activities with tasks aligned to Bloom's taxonomy of learning that

allow students to practice the use of similar structures, do students engage in them in ways that

allow them to be reflective thinkers and writers?

New Literacies

As previously described, literacy is no longer limited to paper and pencil writing projects

and print based reading events. An ability to read and write is pertinent to the successful

assimilation of any individual into modern society. The rapid emergence of technology has

additionally shaped how society differentiates between literate and illiterate individuals. Present-

day expectations for literate individuals are expanding to include a new set of abilities, termed

new literacies that are of increasing importance if one desires to make efficient use of emerging

technologies (Burnett, Dickinson, Labbo, Reinking, & McKenna, 1998; Leu, 2006; Myers, &

Merchant, 2006; Cope & Kalantzis, 2000). Examples of new literacies required by these

emerging technologies include making decisions for the successful playing of video games (Gee,

2007), using a mouse to navigate among the hypertext of the internet to gather information (Leu,

Kinzer, Coiro, and Cammack, 2004), participating in virtual reality simulations for social

engagement (Merchant, 2009), and critically evaluating the mass information available on the

World Wide Web for use in problem solving (Bilal, 2000). The wide range of literacy modalities

impacts literacy learning and development. Leu (2006) and Selfe (1999) described the unique

relationship between technology and literacy; Leu (2006) stated that technology "is a literacy

issue, not a technology issue" (p. 2). Educators must carefully consider how we prepare our

students for the new literacies of the Internet and other ICTs (ICT Literacy Panel, 2001;

Hutchison & Reinking, 2011; New London Group, 2006; O'Brien & Bauer, 2005; Warschauer, 1999).

However, many educators and their instructional practices are still tied to conventional notions of text and the technological practices that are in place often do not support learning in meaningful ways (Cuban, 2001). Ladbrook (2008) studied the text perceptions of students and teachers in New Zealand and examined how teachers could effectively link student perceptions to present curriculum. The findings from this study further support that students and teachers have vastly different perspectives of reading and learning; in addition, the reading experiences of students did not meet the teaching and learning environment of schools. Ladbrook (2008) found that teachers in a high school setting referred to print based, written texts as well as digital texts including blogs, wikis, and websites as being important forms of communication; however, of the 41 teachers studied, 87.8%, or 36 teachers, were reported they use print-based novels nearly all of the time. On the other hand, only 7.1% of the participants used websites for a reasonable amount of time to supplement literacy instruction. (Ladbrook, 2008). The use of blogs and wikis was limited to one teacher (Ladbrook, 2008). Ladbrook's (2008) research is significant in showing that most teachers favor traditional, print-based texts despite their broad definition of text, which tends to include digital text.

While the idea of new literacies has been researched for the past decade, the definition of literacy, as previously described, has evolved and continues to develop in order to reflect the social and technological changes taking place. No single theory fully describes and incorporates the principles of new literacy and learning, and many terms such as multiliteracy, transliteracy, and new literacies are often used synonymously throughout the literature. However, for the

purpose of this research, new literacies will serve as the preferred term and it encompasses the following discussion of literacy.

The design of the new literacies is closely tied with how students inform their lives through traditional print-based texts, digital texts, and media; in addition, the new literacies seeks to understand various forms of literacy that are used to shape students' socio-cultural perspective (Cole & Pullen, 2010). The New London Group developed the term new literacies in order to reconceptualize literacy to fit the changing environment of the digital world and literacy learning (Cole & Pullen, 2010; Mills, 2010). The New London Group (1996) described traditional approaches of literacy instruction as methods that are "restricted to formalized, monolingual, monocultural, and rule-governed forms of language" (p. 61). According to Mills (2010), two prominent factors influenced the development of the new literacies:

> …the need for new literacy pedagogy to account for the multiplicity of communications channels, media, and protocols, tied to the availability and convergence of new technologies…and literacy pedagogy should be transformed to respond to cultural and linguistic diversity as a consequence of migration and globally networked economies. (p. 250)

Exley and Luke (2010) further describe the new literacies as a pedagogical shift that allows for "an oscillating approach to print and digital media, texts and pedagogies, where teachers would use diverse repertoires in response to learners' diverse cultural and linguistic knowledge" (p. 20). The new literacies approach has four non–hierarchical and non-linear components: "situated practice, overt instruction, critical framing and transformed practice" (Exley & Luck, 2010, p. 20). The new literacies approach uses new technologies and various types of literacies to allow

learners to use various types of information to inform their understandings as well as the understandings of others. Although the definitions of the new literacies are constantly changing, it is important for teachers and researchers to better understand how these literacies impact student learning to ensure that all students have the skills and strategies to successfully maneuver their literacy understandings in the face of rapidly changing technology and communication (Leu, 2000). Leu, Kinzer, Coiro, and Cammack (2004) argued for new theoretical perspectives and frameworks to allow researchers and educators to better understand how new literacies impact learning as well as helping to lead future research agendas; however, they proposed that because of the changing and evolving nature of new literacies and technology, theoretical perspectives must "emerge from the new literacies engendered by the requirements and possibilities of new technologies (p. 1572). Larson (2007) pointed out that although it is too early to develop a fully comprehensive theory of new literacies, researchers have identified a list of principles on which a comprehensive theory of the new literacies should be built; each of these will be described in further detail:

1. The Internet and other ICTs are central technologies for literacy within a global community in an information age.

2. The Internet and other ICTs require new literacies to fully access their potential.

3. New literacies are deictic.

4. The relationship between literacy and technology is transactional.

5. New literacies are multiple in nature.

6. Critical literacies are central to the new literacies.

7. New forms of strategic knowledge are central to the new literacies.

8. Learning often is socially constructed within the new literacies.

9. Teachers become more important, though their roles change, within new literacy classroom. (p. 30)

The Internet and Other ICTs are Central Technologies for Literacy Within a Global Community in an Information Age. Literacy is embedded in and develops out of the social practices of a culture. Historically, literacy practices have been dominantly shaped by the traditional notion of book and printed text. However, both the social context and current technology such as the Internet and ICTs are rapidly changing and are becoming central to literacy in a global community. Literacy theory and practice must understand the connections between literacy and ICTs in order to prepare learners for the world today and the future (Leu, Kinzer, Coiro, & Cammack, 2004; New London Group, 1999).

The Internet and Other ICTs Require New Literacies to Fully Access Their Potential. New literacies include the skills, strategies, and critical awareness that permit users to use the Internet and other ICTs in order to identify important information, ask questions, critically evaluate information, synthesize information and effectively communicate understandings. Some examples of new literacies are being able to effectively use a search engine to locate information, the ability to evaluate the accuracy of information from various webpages and understand the information in relation to one's purpose, the ability to effectively use a word processer to clearly communicate meaning with text and graphics, the ability to participate in on-line learning communities, and understanding how hyperlinks work within text (Coiro, Knobel, Lankshaer, & Leu, 2008; Jenkins, 2006; Leu, 2000; Karchmer, 2001; Leu, Kinzer, Coiro, & Cammack, 2004; Luke, 2000; Meyer & Rose, 1998).

New Literacies are Deictic. The meaning and function of literacy is quickly changing as new ICTs encourage users to make sense of its use in current and future environments. The

understanding of new literacies are related to time and temporal context as they are ever-changing and emerging with the development of new technologies. The deictic nature of literacy is impacted by how users construct environments with new technologies and redefine the nature of literate acts (Coiro, Knobel, Lankshaer, & Leu, 2008; Gee, 2004; Leu, Kinzer, Coiro, & Cammack, 2004).

The Relationship Between Technology and Literacy is Transactional. As technology impacts the idea and function of literacy, literacy also transforms the idea and function of technology. New technologies for information and communication have required new literacies in order to make them fully impactful and purposeful. As technology is used in and different ways, new literacies are transformed in the process (Bruce, 1998; Coiro, Knobel, Lankshaer, & Leu, 2008; Leu et al., 2004; Leu, Kinzer, Coiro, & Cammack, 2004; Reinking, 1997).

New Literacies are Multiple in Nature. Many scholars have recently questioned singular definitions of literacy. Multiple literacies describe a set of literacy practices that change according to context. Hence, it is important for educators to help students understand that different types of information can have various meanings and be delivered through numerous formats. New literacies require new skills for students to be proficient users of information (Coiro, Knobel, Lankshaer, & Leu, 2008; Labbo & Reinking, 1999; Leu, Kinzer, Coiro, & Cammack, 2004; Warschauer, 1999).

Critical Literacies are Central to the New Literacies. As users encounters new information, they becoming increasingly dependent on critical thinking and analytic skills. The development of open networks such as the Internet allows anyone to publish information, which is both opportunistic and limiting. As information is published from diverse populations with

strong political, economic, religious or ideological perspectives, the nature of the information

presented is strongly influenced. Hence, classroom instructional will require that students

develop richer and more complex critical thinking and analysis skills (Leu, Kinzer, Coiro, &

Cammack, 2004; Luke, 2003; Warschauer & Ware, 2008).

New Forms of Strategic Knowledge are Central to the New Literacies. Each form of

technology contains different contexts and resources for constructing meanings and requires

different strategies for doing so. Although the new literacies will demand many types of

knowledge, they will undoubtedly include new forms of strategic knowledge needed to

effectively locate, evaluate, and use the resources available within the Internet (Leu, Kinzer,

Coiro, & Cammack, 2004; Gee, 2007).

Learning Often is Socially Constructed within New Literacies. It is simply unreasonable

for one teacher to know all the new literacies and teach these directly to his or her students. As a

result, rich learning experiences will depend on the teacher's ability to develop learning

opportunities in which students seek and share knowledge and expertise in the new literacies

within a community of learners (Luckin et al., 2009). Social learning is not only important for

how information is shared, but also plays a vital role in how information is constructed. For

example, much of the Internet is built on the social knowledge construction of others (e.g.,

threaded discussions, interactive chats, and collaborative databases), which allows users to take

advantage of the expertise of others (Leu, Kinzer, Coiro, & Cammack; 2004; Warschauer, 1999).

Teachers Become More Important, Though their Role Changes, Within New Literacy

Classrooms. As the new literacies become more prevalent, the teacher's role will change in

important and fundamental ways. Since the teacher will no longer always be the most literate

person in the classroom, he or she will assume the role of facilitating complex contexts for literacy learning rather than simply dispensing literacy skills. Students may arrive with higher skills in the new literacies than their teachers, resulting in occasional role reversal between students and teachers (Berry, 2011; Leu, Kinzer, Coiro, & Cammack; 2004).

According to Hamilton (2009), "Now emerging technologies and applications are a medium for building learning communities in ways we could not envision even five years ago" (p. 48). Labbo, Reinking and McKenna (1998), along with Walker (1999), predicted that rapidly emerging technologies would place new expectations on the literate expectations that would include the use of many different symbol systems; strategic thinking; management of information; application of knowledge to life; and learning, thinking, and creating in teams.

Drawing on the variety of symbols used in learning, Kress (1997) researched how young children extract and make meaning through drawing, writing, and creating collages, and he identified young children more as language makers rather than language users. In other words, young children use a variety of semiotic systems, or multimodalities, when constructing meaning. Kress (2004) noted that students need to be offered multimodal symbol systems to express themselves. Additionally, various other research studies explored the use of technology, on-line and offline, to better understand practices embedded in the new literacies and how these behaviors can inform classroom practice (Hill, 2004; Lotherington & Chow, 2006; Merchant, 2009; Ranker, 2006). Both Hill (2004) and Ranker (2006) observed young children using 'offline' computer programs and noted that children often bring a great deal of knowledge and experience using technology and new literacies. Lotherington and Chow (2006) investigated the impact of using Hyperstudio in writing with young children; Merchant (2009) explored how traditional practices were reorganized when young children engaged in an immersive, literacy-

rich online 3-D experience. Such studies note that when students are encouraged to use ICTs in their learning, many students became eager to explore and use the multimodal features and communicative abilities of the ICTs; furthermore, these studies highlight the out-of-school learning that students bring to the classroom and their learning (Hill, 2004; Lotherington & Chow, 2006; Merchant, 2009; Ranker, 2006).

New Literacy Practices and Classrooms. In research of teachers in the United States and Canada, Kist (2005) found a very small number of teachers who have embraced new literacies and information and communication technologies and are implementing innovative instructional practices and tools to teach new literacies to their students. Hutchison and Reinking (2011) further studied teachers' perceptions of integrating ICTs. Hutchison and Reinking (2001) and Kist (2004) noted that many of the teachers studied were not familiar with the scholarly literature related to the theory of new literacies; however, teachers were often aware of the use of ICTs outside of the classroom but rarely integrated such ICTs into the curriculum. Although many teachers are aware of the importance of ICTs, teachers struggle to find innovative ways to integrate meaningful 21st century literacy (Hutchison & Reinking, 2011). According to Kist (2004), these teachers sensed a need for a different approach to literacy instruction and embraced a pedagogical approach congruent with new literacies instruction; such instruction included methods that utilized various tools and formats during daily inclusion and integrated the use of audio and video files, graphic design, computers, and software. The emergent theory of New Literacies is relevant to this study because it offers the opportunity to explore student's learning, literacy development, and new literacy behaviors while implementing choice, discourse and ICTs in a classroom setting.

Each of the learning theories, constructivism, critical literacy and the new literacies, guided my theoretical perspective throughout the research as I investigated how a teacher designed literature responses and projects through a learning management system that encouraged students to analyze, reflect, connect and create while students engaged in various practices of the new literacies. These theories support the social nature of literacy powered by new technologies, offer the essential framework for constructing and reconstructing knowledge in an open discourse environment, encourage students to help them find ownership of their learning, and help define the new learning in terms of new literacy practices. Since the use of technology has been an important agent in transforming the lives of our students, it is important to understand how current research defines learning in the 21st century.

Digital natives, the iGeneration, and 21st century learners. Recent literature on the technological revolution sheds light on how many of the advancements have impacted the culture of learning as well as our everyday lives. In 2005, the National Center for Education Statistics (NCES) reported that 100% of all public schools had Internet access (NCES, 2005). According to the Pew Internet and American Life Project (2007), 94% of American online teens use the Internet for school related research purposes. Barlow (2007) reported that over 80% of kindergartners use computers, and over 50% of students under the age of nine regularly access the Internet. Predictions as to how these advancements impact future learning are vital to understanding learning in the digital age. Barlow (2007) reports that 30% of one's knowledge will be obsolete in 4 to 5 years and that 70% of current technology will be outdated within 6 years. More importantly, it is estimated that 70% of jobs that kindergartners will have do not yet exist (Barlow, 2007). Although classrooms across the county have seen an influx in the use of the Internet and computing devices, Cuban (2001) notes that technology alone does not

guarantee quality instruction. Hence, more research is needed to better understand how technology makes a difference in student learning (Cuban, 2001).

Although it has been said before, today's learner is truly different; these differences seem to emerge and change almost daily, and technology has and will continue to play a huge role in the changing lives of our students (Berry, 2011; Bridgeland, Dilulio, & Morison, 2006; Mills, 2010; Prensky, 2010; Rosen, 2010). Students born in the 21st century have been brought up in a culture of technology where information is vast, instant, and easily accessible. Rosen (2010) describes digital natives or iGeneration children as follows:

> They [iGeneration students] spend their days immersed in a 'media diet', devouring entertainment, communication, and well, any form of electronic media. They are master multitaskers, social networkers, electronic communicators and the first to rush to any new technology. They were born surrounded by technology, and with every passing year they add more tools to their electronic repertoire. (p. 2)

Rosen (2010) further asserts that schools have incorporated technology in ways that do not embrace student learning and a participatory culture of learning.

In her review of research that focused on the New Literacy Studies, Mills (2010) points out that much of the current research is derived from the informal use of new technologies and new literacies. Much of the work researched by the New Literacy Studies movement focused on understanding how the process of reading and writing are understood through social interaction and the meaning gleaned from these practices must be studied in the social and cultural contexts in which they are practiced (Gee, 2007). Ryberg and Dirckinck-Holmfeld (2010) echo the notion that much of the research being carried out seeks to understand how students are capable and

creative users, managers, and creators of digital content but much of the work has been generated by studying students in the home and informal contexts. Ito (2011) describes how many students are prolific users of technology, are highly engaged, and learn a great deal through various types of technology; however, she describes the current divide in education as it pertains to the outside lives of students and the expectations of traditional, school-based learning: "I stand at the cusp of two different learning cultures--one that is about youth-driven social engagement and sharing, and the other that is embodied in educational institutions' adult-driven agendas" (para. 1). Sharpe, Beetham, and De Freitas (2010) note that in spite of the fact that much of the research has focused on informal settings educators have a valuable opportunity to better understand how students' interactions with digital media and technology can impact their learning in more formal settings in order to create new contexts for learning. According to Ryberg and Dircknick-Holmfeld (2010), educators should be encouraged to work to understand these skills in order to create flexible pedagogies to help connect the experiences from home and school.

Mills' (2010) work brought together much of the research focused on how students use digital technology and as well as communicative devices in order to inform their lives and literacy practices. These practices must be understood and the skills or modes of learning embedded within these practices must be uncovered in order for educators to effectively replicate similar learning situations and environments. According to Prenksy (2010), educators can potentially learn a great deal about how students want to learn by giving them an opportunity to voice their opinions, thoughts, and beliefs. Much of what Prenksy (2010) found is similar to what Mills (2010) found when reviewing recent research in how students use ICTs in relation to learning. For instance, Prenksy (2010) identified the following features as being consistent

among diverse student groups when asked what they want from school and are supported

through related studies and organizational surveys:

- They do not want to be lectured to.

- They want to follow their own interests and passions.

- They want to create, using tools of their time.

- They want to work with their peers on group work and projects.

- They want to connect with their peers to express and share their opinions, in class and around the world.

- They want an education that is not just relevant, but *real*.

Remarkably, Mills (2010) echoed many of these same features as she uncovered the ways in

which students were choosing to use digital media and technology to inform their

understandings.

Yelland (2007) conducted research to investigate students' home use of

technology. The investigators during the home "techno-tours" were the children's

classroom teachers as they researched the range of skills students had with ICTs prior to

coming to their classrooms. Yelland wanted to "extend these into an analysis of [a] broader

impact and a critique of their application for learning and meaning making devised a

framework for learning . . . C/ICT" (p. 68). This framework consisted of four quadrants:

1) functional user, 2) meaning maker, 3) critical analyzer, and 4) transforming

understandings. Since each quadrant evidenced specific activities connected to learning

and meaning making, the teachers gained a better understanding of the students' prior

knowledge.

21st Century Learning Environments and Social Learning. The notion of social learning is crucial to understanding the 21st century learner. According to Brooks (2009) and Hamilton (2009), learning has a social context that educators must be willing to embrace; furthermore, the social aspect of learning creates an environment that can provide for deeper, more meaningful learning when students are offered opportunities to share and learn with others. Atwell (2006) warns educators that if schools continue to ignore the possibilities that on-line learning offers as well as the need for collaborative environments then schools run the risk of making schooling irrelevant for students.

Computer Access and Internet Usage. According to the U.S. Census Bureau (2013), computer ownership and Internet usage greatly varies across race and income. In 2011, 84.8% of non-Hispanic Whites reported living in a home with at least one computer and approximately 75% reported accessing the Internet from the same location while about 68% of African Americans reported living in a home with a computer and 60% reported using the Internet from that location (U.S. Census Bureau, 2013). The report, Computer and Internet Use in the United States, states that four out of every ten African Americans did not use the Internet on a consistent basis during 2011 (U.S. Census Bureau, 2013). In addition, only 56% of households with an annual income of less than $25,000 reported having at least one computer, and of these households, 49.8% reported having Internet access (U.S. Census Bureau, 2013). As it relates to the specific area where this research study took place, the 2013 estimated population was 154,721, and the median household income in 2012 was $31,920 with about 23% of the population living below poverty level (U.S. Census Bureau, 2014). It is estimated that approximately 70% of the area's population is connected to the Internet through at least one device at home or at the workplace while 30% is not connected in any way (Internet Access

Local, 2014). The following graph describes the breakdown of Internet access by place and by number of devices in the area of the research study (Internet Access Local, 2014):
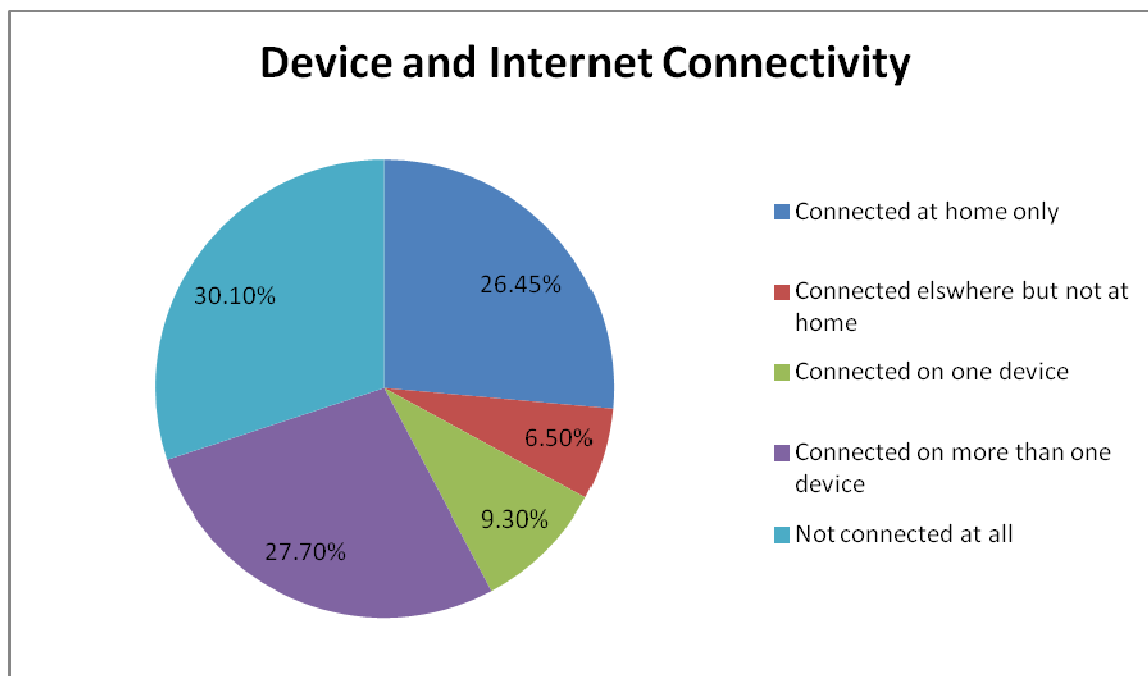
Figure 2. Device and Internet Connectivity. This figure illustrates the number of connected devices and the places of Internet connectivity in the area of the research study.

Summary

Many factors and variables are at play when discussing student learning. Pedagogical beliefs and methods are imperative to understanding learning. Simply adding new technologies will not change the outcomes of teaching if these technologies are not supported by a strong pedagogical framework that supports construction of knowledge, critical thinking, and the new literacies. The previous review of research suggests that technology plays an important role in lives of our students, and many teachers and researchers are finding innovative approaches to effectively implement technology to help students develop much needed 21st Century skills.

However, many classrooms continue to use technology in more traditional ways that do not challenge the past teaching methods. Furthermore, recent data reveals that many citizens in the research area, as well in the United States, have limited access to computers as well as to the Internet, which makes it especially important that educators provide numerous opportunities for students to utilize these technologies to help equip them with the skills they need for future learning and life. If we fail to allow the use of these tools and fail to help students learn to navigate the vast array of ICTs, we, as educators, fail our students. As ICTs continue to proliferate within our society, students need shared learning opportunities that allow them to construct meaning for themselves as well as opportunities to shape their understandings through others points of view through shared learning activities. Rather than remaining dependent on others for information, students should be given the tools to effectively use ICTs, shared experiences, and personal learning to shape their own understandings. In order to effectively compete in the today's world, schools must work to encourage learning that promotes critical thinking, shared learning, and new literacy skills through the integration of ICTs.

CHAPTER 3

METHODOLOGY

Introduction

The following section provides a description of the methods used to collect and analyze

data in a mixed-methods multiple-case study that sought to gain an understanding of the ways in

which economically disadvantaged students' access and use of technology outside of school as

well as how ICTs support the behaviors of the new literacies in an elementary classroom. The

mixed methods approach, which allowed the researcher to investigate questions using both

qualitative and quantitative methods, formed the overall design of this study (Gall, Gall, & Borg,

2007; Teddlie & Tashakkori, 2009; Yin, 2009). Previous research that has focused on students

and the new literacies, the impact of technology on digital natives, and the impact of the digital

divide has been studied through both the qualitative and quantitative lens (Anderson, 2008;

Beckner, 2000; NCES, 2006). While most of the research presented in this study has been either

qualitative or quantitative in nature, this study employed both methods as a way to inform the

researcher of the technology practices of economically disadvantaged students across a grade

level along with the ways in which ICTs support the emergence of new literacies in one

classroom over a six week period. The survey research design was the dominant quantitative

method, which allowed the researcher to better understand the ways in which 60 economically

disadvantaged students accessed and used technology outside of the classroom. Quantitative

research is an "inquiry that is grounded in the assumption that features of the social environment

constitute an objective reality that is relatively constant across time and settings" (Gall, Gall, &

Borg, 2007, p. 650). Gall, Gall, and Borg (2007) further define survey research as "the use of

questionnaires or interviews to collect data about the characteristics, experiences, knowledge, or opinions of a sample or a population" (p. 654). The qualitative methodology was chosen as it provides an expressive, narrative description of a social or human area of interest within a natural setting (Creswell, 1998). Qualitative research is closely associated with interpretive research as well as the constructivist epistemology (Gall, Gall, & Borg, 2007). More specifically, the multiple case study method within the qualitative framework allowed the researcher to deeply investigate the design practices of one fourth grade teacher and the new literacy and learning skills and behaviors of three minority students.

Research Questions

The purpose of this study was to explore how the effective integration of ICTs helps identify and develop the skills and behaviors to support the new literacies in a classroom of economically disadvantaged students and to better understand the opportunities for access to technology among these students.

Specific questions that guided this research study were:

1. What level of learning, as specified by Bloom's taxonomy of learning, is supported in the design of on-line learning?
2. What new literacy skills are practiced by students as they engage in on-line discussions?
3. How does a digital learning management system facilitate interactions among students?
4. How do economically disadvantaged students access ICTs in informal environments?

Research Design

According to Teddlie and Tashakkori (2009), the foundations of the mixed methods design provide a "platform on which qualitative and quantitative questions may be synthesized into integrated themes" to guide a research study (p. 110). Quantitative research aims to build models that will aid researchers in understanding the relationships between variables or groups as well as help to make more accurate predictions (Gall, Gall, & Borg, 2007).

Quantitative Design. The following research questions guided the quantitative portion of this study:

How do economically disadvantaged students access digital learning environments in order to support learning?

Prior research and literature support the impactful nature of the Internet and ICTs in the lives of students; furthermore, the digital divide has led to a deeper awareness of inequities among different socioeconomic groups and their access to technology. The following hypothesis guided the study throughout the research process:

1. Economically disadvantaged students have limited access to the Internet and technology outside of the classroom.

For the purpose of this study, a questionnaire was administered to the sample group; the purpose of this specific method was to determine the average types and places of Internet usage among the sample of economically disadvantaged students to determine the frequency of out of classroom Internet usage as well as the frequency of specific purposes for accessing the Internet. The researcher sought to understand economically disadvantaged students' access to technology so that she can better understand how such access either limits or extends their opportunity to extend classroom learning outside of the classroom.

Qualitative Design. In order to provide an in-depth view of how the teacher's design of activities influences levels of thinking and the construction of knowledge, how students form on-line interactions, and what new literacy skills are employed by students using ICTs in a digital learning management system, the researcher collected qualitative data to provide rich, thick descriptions of the learning tools and environment. Merriam (2009) asserts that research leading to a better understanding of practice with the intent to improve practice supports the goals of qualitative research. The purpose of data gathered through qualitative purposes is research that is "focused on discover, insight, and understanding from the perspectives of those being studied" (Merriam, 2009, p. 1). Qualitative data was gathered through the multiple case study design. Yin (2009) described a case study as the preferred method when research contains a "focus on a contemporary phenomenon within some real-life context" (p. 4). Since the lived experience and the perspective of a complex phenomenon, which is how ICTs support new literacy behaviors and on-line interactions as well as how these impact minority students, the voices of students and their teacher are critical to this research. Their voices will aid in understanding how the design of learning activities impact levels of thinking, how on-line learning forms interactions between learners and how students practice the skills related to new literacies. According to Merriam (2009), "The overall purpose [of qualitative research] is to *understand how* people make sense of their lives and their experiences" (p. 23). Furthermore, the students' perspective is crucial to understanding how they practice the new literacies behaviors.

This qualitative case study was interpretive in nature as it sought to understand interactions, experiences, and meaning constructed by fourth-grade students as they engaged with new literacies and instructional technologies within a learning management system that had various ICTs embedded. The researcher, using interpretive study, was concerned with identifying

how participants made meaning with a phenomenon or particular situation and presenting such findings descriptively (Merriam, 2002). A case study is characterized as a bounded, integrated system in which a unit of analysis or entity (the case) is being studied (Creswell, 1998; Merriam, 2002; Yin, 2009). Creswell (1998) states that a case study is "an exploration of a 'bounded system' of a case or multiple cases over time through detail, in depth data collection involving multiple sources of information rich context" (p. 61). Stake (1995) explains:

> Case studies are investigated because we are interested in them [case studies] for both their uniqueness and commonality. We would like to hear their stories. We may have reservations about some things the people tell us, just as they will question some of the things we will tell about them. But we enter the scene with a sincere interest in learning how they function in their ordinary pursuits and milieus and with a willingness to put aside many presumptions while we learn. (p. 1)

Population and Sample

For the purposes of this proposed study, the population from which the sample was derived was made up of fourth grade students at an inner-city, urban elementary school. The school is located in the south eastern United States and serves over 500 students in grades PreK – 5. The overall school population is approximately 91% African American, 5% Hispanic, 2% Caucasian, and 2% Multi-ethnic. Of these students, 98% qualify for free or reduced lunch.

This study focused on students in fourth grade, which made up the sample. There were four fourth grade classrooms; three of these classrooms were identified as departmentalized in that each of the three teachers taught a specific to subject to all three classes, and the fourth class was self-contained in that the classroom teacher taught all subject areas to that one class. The sample derived from the population for this study was majority African American and consisted

of both males and females between the ages of 10 and 12. Additionally, one fourth grade African American language arts teacher served as a participant to allow the researcher to gain insight into how the teacher's design of activities supports different levels of learning. This particular teacher had previously implemented a digital learning management system, Schoology, which mimics the popular social networking site Facebook, the previous school year when she taught fifth grade. The teacher chose this particular digital management system because it is available at no cost, it is easy and user friendly, and can be monitored by the teacher, parents, and school administrators. Since many students are already using social networking sites like Facebook and research has shown that many students bring their knowledge and skills from out of school learning and ICTs into the classroom, this particular learning management system was chosen (Beckner, 2000).

Currently, the teacher selected for this study was using Schoology to allow students to record an on-line reading response journal. The teacher set up weekly discussion topics about the material that was being read within the class and allowed students to respond to these discussions. Some of the discussion topics related to the character traits of characters being studied, encouraging students to make personal connections with either events or characters being studied, or technical applications of literacy concepts such as the use of metaphors and similes in text. This particular study investigated the on-line discussions, the interactions, and the behaviors that students were engaged in while composing, through different modalities if available, responses and took place over a six week period. With the onset of implementing the Common Core Standards, the school in which the teacher worked encouraged classroom tasks and activities to be aligned with Bloom's taxonomy of learning model since this model encourages higher level standards to encourage critical thinking skills. The first research

question, which was related to the level of learning supported by the discussion design, helped the researcher to understand the level of understanding and application that was expected of the students. The researcher wanted to understand if students were given opportunities to create and analyze meaning through the discussion topics and tasks or if students were limited to recall types of activities. Throughout the research period, students were able to view and comment on responses from other students in the class, and the teacher was also able to comment on student responses. For this study, students were allowed to choose to either record their responses in their print based journal or on the on-line learning management system. During the previous year, students in the teacher's classroom used the same LMS to take quizzes, create a profile with an avatar, send messages to the classroom teacher, embed links to other sites, and upload files created in other software applications such as Microsoft Word. Because the classroom teacher had past success with LMS and since she was familiar with it, the researcher felt it would be a positive way to implement and encourage the use of technology and ICTs.

For the purpose of the quantitative portion of this study, convenience sampling was used since the researcher selected a sample that suits the purpose of the study (Gall, Gall, & Borg, 2007). The participants were chosen as the population of interest because the majority of them are economically disadvantaged students. Of the 60 fourth grade students, 57 are either Hispanic or African American, and all qualify for free or reduced lunch, which identifies them as economically disadvantaged. For the qualitative research design, purposive sampling was applied to the sample to allow the researcher to identify six students who have shown great interest in literacy through reported grades and interest in technology through engagement in technology projects. This information was shared with the researcher by the classroom teacher as well as the technology lab teacher. According to Creswell (1998), researchers generally select no more than

four cases when conducting multiple case studies; however, this study investigated the behaviors and practices of six students because of the limited time frame of the research. Purposive sampling helped the researcher to identify traits and qualities that students possess and support new literacies as they created responses to literature and share learning through ICTs. Although 24 students in the classroom had access to the digital learning management system, data collection and analysis to understand on-line relationships and the influence of new literacies that were pertinent to this study only focused on the six identified students. The teacher participant was chosen through purposive sampling since she had previously shown an interest in using technology to support student learning and taught classes that are made up of an at-risk population. Within the classroom, each student had access to a netbook computer throughout the day and wireless Internet access was available in the classroom. Students were not allowed to take the netbook computers home, but they were allowed to take them to different learning areas within the school such as the media center. Participation in the study was voluntary, and participants had the right to withdraw from the study at any time. This study did not pose any known threat to the participants. After approval by the Georgia Southern University Institutional Review Board (Appendix D) and the County Department of Teaching and Learning (Appendix F), parents of the participants' received an informed consent document.

Instrumentation

For the quantitative portion of this study, a questionnaire was used to provide data related to the final research question, which sought to understand how students accessed and used technology outside of the classroom. The questionnaire (Appendix A) was closed form, and it asked students to identify where they usually access the internet via a computer or tablet when they are not at school. The researcher worked to ensure that the questionnaire was salient in

nature so that the sample was representative of the information addressed on the questionnaire (Gall, Gall, & Borg; 2007). Answer choices were similar to the following list: at home, a family member's home, at the public library, at a community center within their apartment complex; none of the listed. For the purpose of this study, home was identified as the location where students spent at least three nights of the school week. Additionally, the questionnaire asked students to identify how often they used the Internet and for what specific purposes, if any, that they used the Internet. The questionnaire asked participants to identify how many times a week, on average, they access the Internet, such as once a week, three times a week, or more than three times a week, for various specific behaviors. For instance, the questionnaire sought to understand if students had opportunities to access the Internet and to understand why they typically accessed the Internet. The questionnaire was developed by the researcher, and the behaviors were chosen because they were common among the age group of the participants and prior research pointed to these specific behaviors as being popular to digital natives. The questionnaire was written in child friendly terms and was piloted to a group of students prior to this research study. This particular portion of the research investigated the students' self-reported Internet use and Internet behaviors.

Discussion threads were another form of instrumentation that helped the researcher gather rich and insightful information into technology, new literacies, and collaborative behaviors of students. The artifact data retrieved from these on-line spaces were important to understanding the skills and behaviors of students that related to the new literacies. Specifically, the think alouds allowed the researcher to better understand what the student was doing and how he or she came to know how to complete a task. These instruments helped gather information that informed the qualitative data of this research study.

Data Collection

For the qualitative portion of this study, data were collected through a variety of methods to help the researcher answer the first three research questions. Generally, data was collected in the forms of co-participant observation, artifacts in the form of electronic data, semi-structured interviews, and think aloud sessions. Although this research was emergent in nature, a general plan guided the data collection process.

Data for the final research question was gathered through a survey. The researcher was responsible for distributing the questionnaire to all students in fourth grade at the identified school. The questionnaire was distributed over three days to ensure that as many students as possible were given the opportunity to provide feedback. Students were only expected to take the survey once. Students were not expected to report their name on the questionnaire. The data collection process for this particular research question lasted for a period of three days to allow the researcher to reach a desirable return rate of at least 80%.

Sources of Data

In addition to the quantitative data previously described, the researcher employed qualitative data sources in order to gain a rich understanding of how students responded to discussions designed by the classroom teacher via the learning management system. The researcher used various types of data that included semi-structured face to face interviews, classroom observations, think aloud sessions, and digital data from web logs and threaded discussions. According to Yin (2009), the opportunity to use many different sources of evidence is one of the greatest strengths of data collection in case studies. Furthermore, the use of different

sources of data allows for triangulation of data, which can enhance the validity of the study (Merriam, 2002; Yin, 2009).

Think Aloud. Think alouds were one source of data collection for the qualitative portion of this study. The think aloud sessions were semi-structured, took place in the natural setting of the school, and focused on the practices that were observed by the researcher while the student accessed the digital learning management system to create discussion posts, respond to peers, or to complete a task using various Web 2.0 tools. The think aloud sessions probed students to identify the different tools they used as well as to gain their understanding of what these tools were used for when responding to literature to help the researcher answer the second research question. These sessions helped the researcher to understand how and why a student chose a specific literacy behavior as well as to better understand their thinking when creating and responding to posts. In some instances, these conversations helped the researcher gain insight into the specific student's on-line behaviors while out of school, which further added insight into the final research question. In some instances, the think aloud protocol asked students to describe where and how (i.e., computer, mobile phone, tablet) they access the Internet and for what purposes they typically use the Internet; additionally, the researcher used this to better understand the behaviors and skills the students utilized during the observation period. Since the participants were young in age, the think alouds lasted approximately twenty to thirty minutes and took place within the classroom observations. Each of the six students was observed for at least two sessions, and the think aloud questions related to the observed behaviors of the students. The researcher recorded the think aloud sessions.

Observations. Generally, there are two reasons why the participant observer visits the research situation: 1) to engage in activities appropriate to the situation, and 2) to observe the

people, activities, and physical aspects of the situation (Yin, 2009). Students were observed in

their natural setting, and the researcher observed the students as they responded to discussion

posts on the learning management system as well as when they were completing assigned tasks.

According to Yin (2009) participant-observation allows for data that is insightful and meaningful

towards interpersonal behavior and motives. During classroom observations, the researcher

maintained a journal to record descriptive notes and anecdotal observations. The researcher was

looking for what students were doing and their specific behaviors when they were creating their

personal posts for the discussion board as well as when they are responding to others. The

researcher also noted what they did in response to the given tasks; in many cases, the teacher

engaged in a think aloud session with students as they created their assigned task. The researcher

observed to see what new literacy skills and behaviors were practiced by students to help answer

the second research question. For example, the researcher investigated whether or not the

students used word processor programs to format text, if students used features such as spell

check, if they utilized embedded reference resources such as the dictionary or the thesaurus, or if

students referred to information from the Internet before composing and posting their

discussions. The researcher also identified practices that were not limited to text, which included

graphics and diagrams, as students were given the choice to respond through various means and

related ICTs. These examples are some of the behaviors related to new literacies practices that

the researcher looked for, but there were others demonstrated by students. A checklist (Appendix

B) was used to help document the extent to which the characteristics of new literacy practices, as

identified by Kist (2002), were practiced as a result of classroom instruction. This check list was

guided by the characteristics of new literacy practices, and was developed by the researcher in

order to prepare for the observations. However, the researcher did modify the checklist

(Appendix B) throughout the study in order to reflect the emerging behaviors as the study progressed over the six week period. Information gathered from observations were helpful when the researcher conducted interviews or think alouds so that the questions and associated dialogue was personal to each student's specific technology behaviors. The researcher observed in the classroom on twelve occasions for a period of approximately 45 minutes on each occasion. The researcher visited the classroom during the literacy block on Tuesday and Thursday, which were the designated days for students to access the LMS. The researcher wanted to gain an idea of how students used technology to practice specific new literacy behaviors, so observing multiple times throughout the study period provided her with more opportunities to identify these different behaviors. The time limit of 45 minutes was chosen because the classroom schedule typically allows for this amount of time for reading workshop, and the researcher wanted to ensure that her presence allowed for the greatest amount of information to be collected.

Document Data. Digital data such as threaded discussions, web logs, and teacher designed discussion topics were major source of data that further informed the study. The digital learning management system allows students to have many different opportunities to share comments and thoughts on various teacher designed discussion topics related to classroom literacy instruction, which further informed the results related to the third research question. As students responded to teacher designed discussions as well as to other student discussion responses, the digital data was archived. Additionally, students had the opportunity to upload information composed in word processing programs such as Microsoft Word; students were also allowed to post links to works created through web-based programs such as Wordle. These documents helped the researcher to study the on-line habits of the participants to determine the types of new literacies commonly practiced and may serve as student work samples, which

helped to answer the second research question. As previously stated, as students responded to others' posts and as the teacher responded to student posts, these documents helped the researcher to understand the on-line interactions that took place on the learning management system as well as in the classroom through face-to-face communication. Additionally, document data related to the teacher designed discussion topics were an important source of data that helped the researcher understand the level of learning that was required by each discussion and provided data for the first research question. It was important to understand if students were continually being asked to recall basic information or if they were expected to analyze topics such as character traits so that the researcher could identify the types of activities offered and the relation to observed new literacy practices. The researcher, classroom teacher, principal, and participating students were the only individuals with access to the learning management system; individuals have a specific username and password that must be used in order to access the learning management system. The following table describes the assignments, discussions, and tasks that students were expected to complete during the six week research period:

Table 1

Assignments, Discussion Posts, and Application Tasks from the Learning Management System

Assignment	Discussion Post	Application Task
In this lesson, we will be learning about biographies. First, go to this site http://www.studyzone.org/testprep/ela4/h/biosl.cfm. Then, go to www.pebblego.com and click on the "Biography" module. Choose two people that interest you and read about them. Formulate a list of things that that you think a biography should have. This site might be helpful too: http://www.timeforkids.com/files/homework_helper/aplus_papers/Biosampler... Please write the characteristics that you found in the discussion area.	What makes a biography a biography and what should biographies include? Formulate a list after viewing examples.	Create a short biography about your life or someone you want to know more about. You can either create it with a program on the netbook or with paper and pencil. If you use a computer program, please upload your file.
This week we are going to identify what readers do when they read stories well and what they do when they struggle while reading stories. You will focus on both. First, you need to listen to some examples of a read aloud. You will need to use the attached document for where and what to listen to. You will need to create a web for each topic: Good Readers and Struggling Readers. Use the attached graphic organizer and upload your files in the discussion post.	What do good readers do when they read aloud compared to struggling readers? Why is it important to be a fluent reader? Be sure to upload your concept web.	Use an audio recording device (AudioBook app, Audacity, RazKids) to create a sound recording of you reading a book of your choice. Next, evaluate your reading according to one of the concept webs uploaded in the discussion post and share your findings with us under the assignment tab.

This week we are going to study different genres. Specifically we will dig into the genre of "fables". You will need to use the attached link for a list of websites that have fables for you to listen to and read. While you are reading and listening, be thinking about common characteristics of all of the stories. These are the characteristics that will make a fable a fable and not a fairy tale or a myth. Use your reader's notebook to make a list of fable characteristics as well as a list of your favorite fables.	What makes a fable a fable? How are fables different from fairy tales, which we studied earlier in the year?	Create a Wordle with the ideas/concepts that you discovered and feel are important to understanding fables and another about fairy tales. You may want to create your list in Word and copy and paste it into Wordle.
Since we have been talking about careers and working on our career presentation, this week will research a career of your choice. You will need to research the career of your choice and respond to the discussion questions.	Describe the career you chose. Be sure to include important facts about your career choice such as level of education needed, specific job duties and responsibilities, average salary, etc. Why is this career of interest to you?	Create a project sharing your career choice. You can use different computer programs like Word or PowerPoint or you can create a booklet using paper. How you want to present your findings is really up to you, so try to be creative!
Go to Tumblebooks and pick a book that interests you. Listen to the story and think about the problem/conflict and how it was solved.	What was the story you read? What was your favorite part of the story? What did you do after the story (play a game, watch a video, etc.)?	http://www.scholastic.com/teachers/lesson-plan/collateral_resources/pdf/l/lessonplans_graphicorg_pdfs_problemdiagram.pdf Complete the graphic organizer and upload it.
Evaluation and Catch-up – Provide your thoughts on using Schoology in the classroom and finish any unfinished projects or discussions.	What specifically did you enjoy about using Schoology? Should teachers continue to use it and why? Did you learn anything new through using this	No task

site?

Validation Strategies

According to Creswell and Miller (2000), qualitative researchers should use a variety of validation strategies to ensure their studies are credible and rigorous. For the purpose of this research, one validation strategy used to support credibility was triangulation. Various types of data were analyzed and common themes within and across the various sources of data were compared. Construct validity was established through the use of multiple sources of evidence (Yin, 2009).

Ethical Considerations

This research posed no known risks to participants. Pseudonyms were used for all participants. Furthermore, questionnaire data about Internet and ICTs access and usage was anonymous. All teachers had access to training and information related to the teaching with ICTs and new literacies practices. Participants had the right to withdraw from the research study at any time. Furthermore, all participants' names were changed and any identifiable information was removed. All documents related to this research were kept on the researcher's computer in a locked file. Print based documents were also kept in a locked cabinet in the researcher's office.

Summary

In this section, the design and methods for this study were explored in relation to each research question. The research design, population, sample, data collection methods and procedures were described in detail. Furthermore, the rationale for implementing the mixed-methods framework was presented. The purpose of this study is to help the researcher and other educators understand how fourth grade economically disadvantaged students access and use the Internet when out of school, how a teacher designed discussion posts for a learning management

system to encourage various levels of thinking, the types of interactions that took place within a learning management system, and the new literacy practices exhibited by the fourth grade students when responding to discussion posts on a learning management system.

CHAPTER 4

ANALYSIS AND FINDINGS

Introduction

As technologies change and become readily available in today's society as well as within the classroom, literacy and literacy instruction are changing. Professional organizations emphasize the importance of integrating instructional technologies into current classroom instruction (IRA, 2002; NCTE, 2005). Additionally, teachers search for effective ways to utilize the potentials these new technologies offer in order to prepare students for the digital age and to embrace the notion of new literacies. In this chapter, an analysis of the data gathered throughout the course of this study is presented. This mixed methods case study was conducted during April and May of 2013 in an elementary school in the Southeast. It addressed the students' use and practice of new literacy skills through various curriculum integrated ICTs, students' access and use of technology outside of school, and the levels of learning supported through an ICT designed environment. Throughout the study, a classroom of twenty-four fourth grade students used various ICTs to engage in on-line learning. Specifically, six students from the classroom were chosen to serve as the case study participants and were recommended by the classroom teacher because of their previous engagement with technology and willingness to learn. The purpose of this study was to explore how a teacher can effectively integrate ICTs that develop the skills and behaviors to support the new literacies in an economically disadvantaged classroom and to better understand the opportunities for access to technology among these students. Through repetitive, ongoing review of multiple sources of information, which included observations, think alouds, semi-structured interviews, and artifact data, I sought to establish

patterns and emerging categories and themes to answer the research questions that guided this study. This chapter describes the protocol for data collection, which included semi-structured interviews, classroom observations, artifact examinations, and a researcher's journal, that was used across the six cases. This chapter presents a detailed description of the themes that emerged from the cases as they relate to new literacy skills and on-line learning, an overview of the students' access to technology outside of school, and the levels of learning expected in the specific cases. This study sought to address the following four research questions:

1. What level of learning, as specified Bloom's taxonomy of learning, is supported in the design of on-line learning?

2. What new literacy skills are practiced by students as they engage in on-line discussions?

3. How does a digital learning management system facilitate interactions among students?

4. How do economically disadvantaged students access ICTs in informal environments?

Through rich description, I begin this chapter with an account of a fourth-grade student's interaction with and approach to on-line learning within the context of a LMS. I then describe the various levels of learning that were found throughout the course through the discussion and application components. Next, I introduce the major themes that emerged among the new literacy skills that were found as students interacted and responded to discussion posts and assignments within the LMS. These themes and categories are defined and discussed, supported by italicized examples of fifth-grade students' responses. To preserve the unique voices and authentic language of children, students' written responses have been left untouched. Any changes or clarifications are shown within brackets [ ]. Additionally, I explored the types of

interactions between students and teachers as they participated in on-line learning. Finally, I present information on how and why students access information outside of the school

Data collection for this study took place at an elementary school in central Georgia for a period of six weeks from March through April of 2013. The school is comprised of over 500 students from grades prekindergarten through fifth grade; it is a Title I school, and over 98% of the students qualify for free or reduced lunch. Various sources were collected for this study: surveys, think alouds, observations, and field notes. The teacher for this study was chosen through purposive sampling; she is a veteran teacher with more than 12 years of teaching experience. All 12 of those years have been at the same school in which the study took place. The teacher was chosen because of her knowledge of teaching reading and literacy as well as her desire to include new technologies in the classroom. The teacher described herself as technology literate and felt that she had sufficient technology skills to help implement the study. This fourth grade classroom teacher nominated six students to participate in this study. These students showed an eagerness to learn in the classroom setting, and from the teacher's perspective, displayed a basic to intermediate knowledge of computers and technology; the classroom was chosen because of the teacher's willingness to integrate ICT's into her instruction. The six students that make up the cases are part of a larger fourth grade classroom of 24 students. The researcher conducted two 45 minute visits twice a week to observe the class, take notes, and engage in think aloud sessions with the six cases to identify new literacy skill practices. Each of the six students that served as the case study participants were recommended by the classroom teacher because of their previous knowledge and desire to use technology in the school. All of the students demonstrated average to above average academic achievement, and one of the students was identified as a gifted learner and received instruction from the local gifted teacher

once a week. According to the classroom teacher, four of the five students regularly participated in classroom discussions, but one of the students typically had to be prompted to share his or her learning in the classroom. Each of the six students completed homework assignments on a regular basis as reported by the teacher. The chart below gives a brief, demographic description of the six case study participants. All of them were students in a regular education fourth grade classroom.

Table 2

Case study participants

Name	Gender	Age	Race	Free and Reduced Lunch
Student 1	F	10	African American	Y
Student 2	M	9	African American	Y
Student 3	M	9	African American	Y
Student 4	F	10	Asian	Y
Student 5	F	10	African American	Y
Student 6	M	10	African American	Y

Summary of Data Collection Process

In order to answer the first three qualitative research questions', the researcher's reflections of the procedures were kept throughout the duration of the research. I conducted ten

think aloud sessions among the six case study participants and twelve observations and gathered approximately five hours of data through audio electronic recording as well as numerous pages of written documentation, which included a new literacy skills checklist (Appendix B), and artifact documentation from the LMS (examples in Appendix C). Specifically, the researcher observed in the classroom for approximately 45 minutes on twelve occasions, which took place on Tuesday and Thursday from 1:30 p.m. to 2:15 p.m. for a six week period. All raw data was transcribed into Microsoft Word documents and saved on the researcher's computer. The constant comparative method was used to read and reread the transcripts of the interviews, observation data, and artifact data to initially identify and then confirm common categories and emergent themes. All coding and labeling of data was done manually. The codes or behaviors used by the participants were analyzed as to their frequency of use in the transcribed interviews and artifact data before being converted into thematic groups. Artifact data was pulled from the LMS and snapshots were taken for analysis since the data on the LMS is only available for a certain period of time. Careful attention was paid to obtain rich and thick information through the utilization of codes, coded families, and overarching thematic outcomes.

The six cases and observational data in this study presented significant data. Using cross-case analysis allowed me to determine four recurrent themes. Each theme was labeled to categorize each aspect. Each of the themes will be addressed separately in the sections to follow. A few sections contain students' responses presented in italicized text in order to provide unspoiled voices from their stories.

The fourth quantitative research question was answered through survey data. A survey was given to all fourth grade students in the school to better understand at risk students' access to the Internet outside of the school. A total of 60 surveys were administered and 55 were analyzed;

of the five surveys that were not analyzed, two were incomplete and three were completed incorrectly or were not readable. Purposive sampling was used to determine the survey participants.

Levels of Learning

> *I like it when I can learn on my own because sometimes the teacher tells me things that I already know, and I get really bored.*
>
> - *Student 6 (personal communication, April 16, 2013)*

As the demands for student learning increase, students are expected to move from understanding to applying and analyzing information to make sense of it and to apply it to other areas of learning. Furthermore, the increased use of ICT allows students to be creators of knowledge rather than solely being recipients of information. As part of this study, it was important to analyze the levels of learning that the implementation of the LMS encouraged, which is reflected in the first research question. Together with the researcher, the classroom teacher designed, developed and implemented a list of discussions and tasks that encouraged higher level thinking because of the access to information through ICT. According to Bloom, instruction can either encourage higher level thinking or it can limit thinking through requiring basic recall of skills, definitions, and understandings (Anderson & Krathwhol, 2001). Each of the discussion topics were coded according the level of learning they encouraged. The researcher worked with the classroom teacher to determine the level of learning for each of the discussions and tasks. Both discussions and tasks were coded according to Bloom's taxonomy of learning as determined by the researcher and classroom teacher.

Table 3

Codes for Learning Levels According to Bloom's Taxonomy

Week/Topic	Discussion	Application/Task
1 - Biography	Analyzing	Creating
2 – Fluent Readers	Analyzing	Creating/Evaluating
3 - Fables	Analyzing	Applying
4 - Career	Comprehending	Comprehending
5 – E-Books	Analyzing	Analyzing
6 – Wrap-up	Evaluating	N/A

In most cases, students were expected to discover ideas and topics throughout the learning process rather than be dependent on the teacher for information. The teacher was able to serve more as a facilitator of learning rather than being the singular source of information. This move towards facilitation was important because of recent changes in state standards and the adoption of the CCGPS. Bloom's taxonomy serves as a means for categorizing qualitatively different kinds of thinking (Anderson & Krathwhol, 2001). In the past few decades, the original taxonomy was revisited because of new ways of thinking about learning and the shift to learning as being an active process that takes place in the learner rather than a passive process where the teacher is the generator of knowledge (Anderson & Krathwhol, 2001; Churches, 2014). The taxonomy identifies six levels of the cognitive dimension: remembering, understanding, applying, analyzing, evaluating, and creating. Lower levels, such as remembering and understanding do not require as many cognitive skills and as much cognitive processing as do the higher levels like evaluating and creating. Not all learning experiences are meant to take place at

the highest level; students must be able to use lower level skills in order to perform higher order tasks (Churches, 2014). The purpose of analyzing the questions and tasks was to help the researcher understand if the LMS allowed the teacher to design meaningful discussion and activities that supported higher level thinking.

The lowest level of learning that emerged from the data analysis was comprehension, which was found twice in the coding of the discussion and task data. Students had to be able to comprehend throughout various learning activities, but in many instances, the outcome of learning was not simply comprehension. However, the third week of the study did require students to locate information about a career of their choice and to report back on basic job requirements related to that career, which requires less cognitive involvement than other tasks. Most students did not finish the task phase of this week, which was creating a PowerPoint, because it was an ongoing project. Students worked on their PowerPoint presentations with the counselor at the school, and the researcher was not present when students completed this project. However, the creation of the PowerPoint is also a lower level thinking skill because they are just summarizing information that was found on-line and transferring it to another location.

Applying learned information with previous information and using it in a new way is a higher level skill than comprehending. Applying was only found once in the analysis of the discussions and tasks presented to the students in the LMS. Students were expected to apply what they had learned in order to create a Wordle, which is a graphic representation of a concept. Students were to make a list of important words related to fables and fairy tales and import those words into the graphic model. Students had the ability to put more emphasis on words that they thought were important and less emphasis on words that carried less meaning.

One of the most common levels of learning that the discussion questions and tasks encouraged was analysis. For this level of learning, students were expected to take a broad topic such as biographies, fables, fluent versus non-fluent reading, and stories and break them into specific traits, behaviors or characteristics. Students were given a variety of tools such as videos, audio recordings, websites, and multimedia text to help them understand the main concept or topic. From there, students used these various sources to compare and contrast similarities and differences or to help them identify important variables that constructed the concept. As stated by the classroom teacher,

> Schoology allowed me to put the information the students needed on the website. Students were able to work at their own pace and were able to review the sources of information as often as needed in order to complete the assignment. When I am teaching whole group, I am not always able to do that because I have students at such different levels, and we usually run out of time. Those students that needed assistance usually asked for it, but my advanced students were able to work ahead and didn't get bored.

According to Bloom's Taxonomy, the ability to analyze is a higher order thinking task, but it is not the highest (Anderson & Krathwohl, 2001).

The ability to create and evaluate require higher order thinking skills, and during this study, students were expected to occasionally use similar skills. For instance, during the second week of the study, students identified specific behaviors of fluent and non-fluent readers through the use of on-line videos and audio recordings. Students completed webs that described each type of readers' behaviors. During the task phase, students had to record themselves reading a short paragraph or story and had to evaluate their level of fluency according to their findings. Students were also encouraged to evaluate their learning as well as the use of the LMS during the

final week of the study. Students first had to identify new areas of learning and how the LMS

helped them as well as how the LMS should be used as a teaching and learning tool for the

future.

The teacher worked with the researcher to design, develop and implement assignments,

discussions, and tasks for the students to complete through the LMS and with the assistance of

various Web 2.0 tools. The expected level of cognitive complexity varied throughout the study

period varied. The ability to share information and to align various resources in a central location

for students to access allowed the teacher to plan activities that were meaningful, engaging, and

encouraged the development of higher level thinking skills. In addition, these activities helped to

promote and develop the use of new literacy skills as students navigated through the

assignments, discussions and tasks on the LMS.

New Literacy Skills
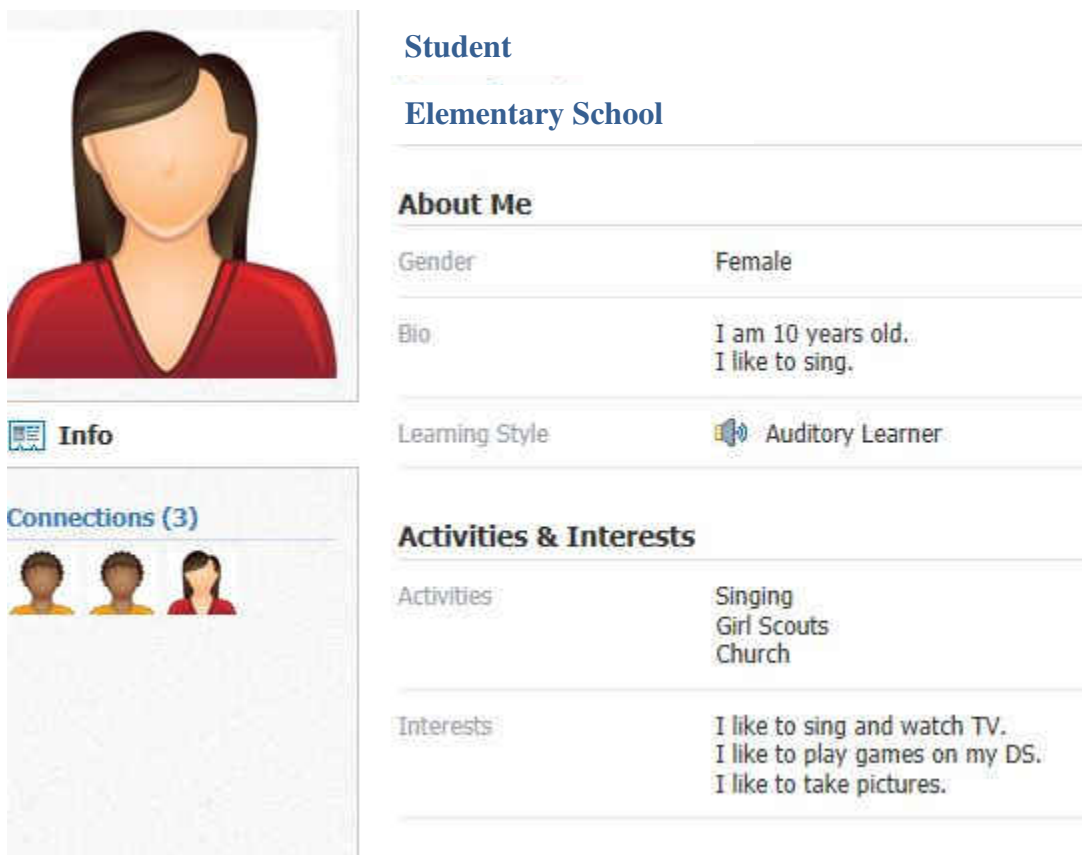
Getting to make posts in school is fun.

- *Student 3 (personal communication, March 21, 2013)*

To learn more about how and why the students interacted with and reacted to on-line

learning through a learning management system, I reviewed a plethora of data sources including

field notes, transcripts of student think alouds, observations, and artifact analysis. To gain a

better understanding of the various literacy skills that the students possessed, an application or

task section was created and added to the study. This change took place while the teacher and

researcher were designing the discussion questions because we thought it would allow the

students to create various pieces of work that required some type of application of new literacy

skills. The following section provides a detailed description of students' reactions to and

interactions with the learning management system and describes the major themes related to the

new literacy skills that emerged throughout the study, which helped the researcher answer the first research question. The following themes were identified as new literacy skills through the use of the New Literacy Skills checklist (Appendix B). The major themes identified were personalization of a profile within an LMS, participation in on-line discussions, use of language, locating and evaluating on-line information, sharing created files, shared learning, use of word processing applications, multimedia, and lack of at home use. The students participating in this study reported little to no previous interaction with a LMS, but they were familiar with popular social networking sites such as Facebook and Instagram.

Personalization of Profile. One of the first tasks that each of the six study participants did upon logging into the LMS was to personalize their profile. Although students were not allowed to upload personal pictures to their profile, they were able to pick an avatar from a small database within the LMS to set as their profile picture. Additionally, students were able to write a short list or passage about themselves that would be shared with others if they click on the appropriate section, which included an about me section as well as an interests and activities section. Although the LMS has another section for contact information, which allows students to share their email, phone number, websites and address, this particular feature was disabled to protect the privacy of the students participating in the study. The ability to personalize a profile was not shared with the students. Student One was the first participant to personalize her profile. Upon creating her avatar and updating her profile section, other students were made aware of her changes on their notification feed. By the end of the first day of the study, all of the six students had also made personal updates to their profiles. To protect student confidentially, student created avatars were removed from graphics taken from the LMS that are included in this study.

Figure 1 is an example of one student profile created during the first day of the study; the avatar for this student has been changed to retain confidentiality.

Figure 3. Student Profile. This figure illustrated a student's profile in Schoology.

When asked about how students knew how to create a profile, Student 5 stated that she noticed the change on her timeline because it notified her that Student 1 had made changes to her profile. She also stated that it was easy to create her profile because she had done it previously in Facebook and they were "pretty much the same." Student 3 told the researcher that he thought it was important to update your personal profile so that other students could learn about you and you might find someone in the class that likes the same things you do (personal communication, March 7, 2013). Student 6 stated that she liked that she could make a profile but that she wanted

to be able to put up real pictures of herself because so many of the avatars were the same (personal communication, March 7, 2013).

The ability to have a personal "space" in the LMS seemed to be very important to the students. Although they could not personalize the space to their liking, each of them did fill out brief biographical information and chose an avatar to represent their "on-line" selves. The fact that this particular site was very similar to Facebook made it easy for them to navigate to the profile section and complete it without any teacher assistance.

Participation in On-line Discussions. Students were eager to participate in on-line discussions via creating a post to share their learning through the LMS. Students were also enthusiastic about the opportunity to respond to other students' posts, and the following data not only details the new literacy skills possessed by students but it also serves to help the researcher understand how a digital learning management system facilitates interactions among students, which is the third research question of this study. As seen in the following conversation between the teacher and students, the students were not only excited about the sharing and posting aspect of the LMS, but they were excited about the ability to access the site from home and by its resemblance to Facebook.

When students first logged onto the website, they described its similarity to the popular social media site, Facebook. The following is a conversation between the students and the teacher about the site after the teacher described what the students would be doing (personal communication, March 5, 2013):

S1: "Is this just like Facebook?"

T: "In a way, yes, it is like Facebook. You can share pictures and status updates, but you will not be able to message one another. You will only be able to message me."

S2: "Why can't we message each other?"

T: "Well, why do you think I turned that setting off."

S1: "Cause we might share things we should not share at school."

T: "Yup, that is pretty much why. I trust you guys, but I just want to create an environment that is safe for you. Any other questions?"

S4: "Can we do this at home?"

T: "Yes, you can use it anywhere that you can get on the Internet."

S1: "I don't have Internet at home."

T: "Well, you don't have to get on it outside of school because you will have plenty of time here to log on and do your work, but if you want to get on while you aren't as school, you can."

S2: "I think this is pretty cool."

S4: "I think we should start."

The type of participation varied on the tasks that were given to the students each week. In some instances, students were expected to respond to discussion posts as well as to a task or application post; however, the task section typically allowed students a choice of presenting information through the use of ICT's or through traditional print format. Additionally, the number and type of posts that were made throughout the study varied depending on the discussion or task. When analyzing the posts that were made, five themes related to posting emerged from the study: general agreeing, questioning, clarifying, extending, and unrelated. Another common behavior practiced by each of the six cases was the "liking" of posts. Each of these themes as well as the number of posts will be explored in the following section. For reference, the table below provides an overview of the weekly expectations, which includes the task or assignment, the discussion and the application.

Table 1

Assignments, Discussion Posts, and Application Tasks from the Learning Management System

Assignment	Discussion Post	Application Task
In this lesson, we will be learning about biographies. First, go to this site http://www.studyzone.org/testprep/ela4/h/biosl.cfm. Then, go to www.pebblego.com and click on the "Biography" module. Choose two people that interest you and read about them. Formulate a list of things that that you think a biography should have. This site might be helpful too: http://www.timeforkids.com/files/homework_helper/aplus_papers/Biosampler... Please write the characteristics that you found in the discussion area.	What makes a biography a biography and what should biographies include? Formulate a list after viewing examples.	Create a short biography about your life or someone you want to know more about. You can either create it with a program on the netbook or with paper and pencil. If you use a computer program, please upload your file.
This week we are going to identify what readers do when they read stories well and what they do when they struggle while reading stories. You will focus on both. First, you need to listen to some examples of a read aloud. You will need to use the attached document for where and what to listen to. You will need to create a web for each topic: Good Readers and Struggling Readers. Use the attached graphic organizer and upload your files in the discussion post.	What do good readers do when they read aloud compared to struggling readers? Why is it important to be a fluent reader? Be sure to upload your concept web.	Use an audio recording device (AudioBook app, Audacity, RazKids) to create a sound recording of you reading a book of your choice. Next, evaluate your reading according to one of the concept webs uploaded in the discussion post and share your findings with us under the assignment tab.

This week we are going to study different genres. Specifically we will dig into the genre of "fables". You will need to use the attached link for a list of websites that have fables for you to listen to and read. While you are reading and listening, be thinking about common characteristics of all of the stories. These are the characteristics that will make a fable a fable and not a fairy tale or a myth. Use your reader's notebook to make a list of fable characteristics as well as a list of your favorite fables.

What makes a fable a fable? How are fables different from fairy tales, which we studied earlier in the year?

Create a Wordle with the ideas/concepts that you discovered and feel are important to understanding fables and another about fairy tales. You may want to create your list in Word and copy and paste it into Wordle.

Since we have been talking about careers and working on our career presentation, this week will research a career of your choice. You will need to research the career of your choice and respond to the discussion questions.

Describe the career you chose. Be sure to include important facts about your career choice such as level of education needed, specific job duties and responsibilities, average salary, etc. Why is this career of interest to you?

Create a project sharing your career choice. You can use different computer programs like Word or PowerPoint or you can create a booklet using paper. How you want to present your findings is really up to you, so try to be creative!

Go to Tumblebooks and pick a book that interests you. Listen to the story and think about the problem/conflict and how it was solved.

What was the story you read? What was your favorite part of the story? What did you do after the story (play a game, watch a video, etc.)?

http://www.scholastic.com/teachers/lesson-plan/collateral_resources/pdf/l/lessonplans_graphicorg_pdfs_problemdiagram.pdf

Complete the graphic organizer and upload it.

Evaluation and Catch-up – Provide your thoughts on using Schoology in the classroom and finish any unfinished projects or discussions.

What specifically did you enjoy about using Schoology? Should teachers continue to use it and why? Did you learn anything new through using this

No task

site?

There were no set expectations for students to respond to one another other than to keep in mind that their posts should be school related and meet the classroom expectations of appropriate behavior. However, all of the students began responding to one another's posts on the first day without assistance from the teacher or other students. As a pre-introductory activity, the teacher asked each student to briefly introduce themselves by creating a post that included two facts about themselves. The teacher also told students that they were allowed to "meet and greet" other students by responding or replying to other students but that it was not required (personal communication, March 5, 2013). Of the 6 students that participated in the on-line discussion, 5 of them replied to at least one post once, 2 of them replied to at least two posts and 1 of them replied to at least three posts. The pre-introductory posts were not included in the data analysis of this study other than to provide evidence of the students' ability to quickly navigate within the LMS and create posts. The nature and content of the posts was usually limited in language and will be further discussed in the upcoming section.

Upon further analysis of the posts that were made on the LMS by the six case study students, the number of posts made changed according to the weekly topic. For the purpose of this study, an original post is one that was identified as the original assignment post crafted by each of the six students under either the discussion or assignment link within the LMS or a post submitted as a question in relation to the topic, while response posts were crafted in response to an original post. Additionally, each posting group, which included six groups or one for each of the six weeks, was studied as either a discussion group or an assignment group. The two groups were not combined but were analyzed separately for the purpose of identifying the number of posts made. Additionally, the teacher posts were not counted as the researcher wanted to gather

an accurate account of student participation; however, student responses to a teacher post were

included. The following table describes the number of posts made each week from the six cases.

Table 4

Number of Posts for Weekly Discussion Topics

Week/Discussion	Original Posts	Response Posts
1 – Biography	8	12
2 – Fluent Readers	7	5
3 – Fables	7	8
4 – Career	8	13
5 – E-Books	6	8
6 – Wrap-up	6	9

Table 5

Number of Posts for Weekly Task/Application

Task/Application	Original Posts	Response Post
1 – Biography	6	17
2 – Fluent Readers	6	3
3 – Fables	6	6
4 – Career	6	0

5 – E-Books	6	4
6 – Wrap-up	6	0

In many instances, the students had more discussion around topics that related to their personal ideas and choices. For instance, students posted and responded more to the weeks that required more personal engagement rather than to the weeks that required them to respond to a specific standard that did not necessarily relate to their personal views and life. When students were asked to share information about themselves such as during week 1 and week 4 the number of posts rose as compared to the weeks that they were expected to describe findings related to a state standard. During a think aloud for week 4, which was related to career choice and exploration, Student 6 described the following:

> "*I like seeing what everybody else wants to do and what they need to be able to do that job. Like, I think [Student 1] would make a good singer. She sings at my church, but she doesn't want to be a singer. She said that she wants to be a lawyer. She is really smart. That would be a good job for her.*" (personal communication, April 4, 2013)

According to Student 3, discussions that required students to find similar information, such as characteristics of a fable, limited discussion: "*I did not post anything extra this week because we all know the same things. I know what fables are and everyone else does too*" (personal communication, March 19, 2013).

Upon probing Student 3, the researcher asked if he thought he could learn something new from one of the other students' posts; for instance, maybe another student included a

characteristic or the title of a fable he did not know about. Student 3 responded: "*I don't think so. I didn't have time to read them*" (personal communication, March 21, 2013). According to Student 3, he did not always read what the other students posted because it was too much information, but he usually read what his friends wrote and what the teacher wrote to him (personal communication, March 21, 2013).

In other words, students seemed to be more interested in posts that allowed them to learn more about other students' lives rather than discussions and posts that required them to investigate concepts related to a teaching standard, and they enjoyed being able to see what their friends had to share. The final week brought about more discussion compared to the previous week as it was related to what students learned and the evaluation of using the LMS. According to Student 5: "*I learned a lot about using Word and Wordle. I also learned to how copy and paste. I am not good at typing. I like using Schoology*" (personal communication, April 16, 2013). Student 6 stated: "*I liked that I could use the computer to fill out my web*" (personal communication, April 16, 2013). According to Student 1: "*I already used Word. I liked getting to read the books and do research. I like making a post*" (personal communication, April 16, 2013).

Upon deeper investigation, the types of discussion posts were grouped into various themes depending on the content of the post. In most cases, student responses and posts were simply stated and relatively short. Posts that were related to a discussion were typically longer, such as the biography posts made by four students during week one. Also, some of the posts were composed in sentence format while others were lists. As I studied the posts for each week, I coded the data according to the type of post that was made. The major themes that were found among all six weeks were posts that were general agreeing posts, questioning posts, clarifying posts, extension posts, or posts that were unrelated to the topic of discussion. Once again, the

teacher's posts were not included in this data analysis and only student posts were analyzed and coded. The following table describes the number of posts that feed into each of the major posting themes described above. For the purpose of this study, the original post that related to the assignment or discussion was not counted, but any original posts that posed a question or provided input into the assignment or discussion as well as any response posts were counted.

Table 6

Coded Weekly Posts and Responses

Week Number (Discussion and Assignment)	General Agreeing	Questioning	Extending	Clarifying	Unrelated
1 – Biography	8	6	2	2	1
2 – Fluent Readers	4	1	1	0	0
3 – Fables	3	2	0	2	2
4 – Career	7	3	2	3	0
5 – E-Books	4	2	1	2	0
6 – Website Evaluation	7	0	0	1	0

Agreeing. The most common type of response post was a general agreeing post. The agreeing type post made up 50% of the posts made by students. In these instances, students were typically agreeing with what another student had posted. The following posts were from the first week discussion and help describe the type of agreeing posts that were made throughout the study.
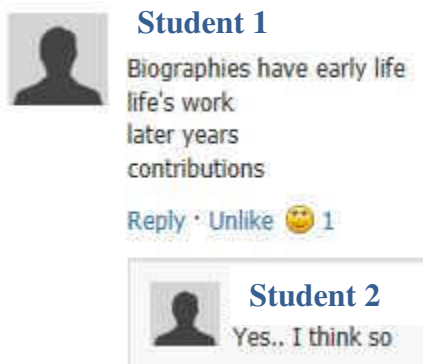
Figure 4. Student discussion post. This figure illustrates an agreeing type of discussion post.

In some cases, students simply wrote, "I agree" and in other cases they wrote what they specfically agreed with, such as the follwing response during week one by Student 3: "I think timelines are better than concept webs, too" (personal communication, March 5, 2013). With the agreeing type posts, students did not typically reflect upon their thinking in order to describe why they agreed or why they thought what they thought. Upon conversation with the researcher, students were able to reflect with direct questioning (personal communication, March 7, 2013):

R: "I see you responded to Student 4 that timelines are better than concept webs when doing a biography, but why do you think that?"

S2: "Because a timeline puts things in order so you can understand their life better."

R: "Do you think it would have helped if you would have stated that in your post so that other kids reading it might see why you think that?"

S2: "Maybe, but I don't know."

Week 5 of the study also had many agreeing type posts. These posts were mostly related to liking a story that another student had read. In one instance, Student 5 stated in reponse to Student 4's

post about reading a Robert Munsch story: "I like his stories i like stephanie's ponytail" (personal communication, April 9, 2013). The final week of the study also had many of these types of post. Students typically agreed with the learning that took place and with what students said they liked about using Schoology. In some cases, one student posted something specific that he had learned and it prompted another student to recall learning the same thing.

Questioning. There were some instances where students reflected on posts and responded in ways that encouraged thinking. For example, students would sometimes ask other students questions or would offer ideas to extend the idea of a post. Questioning posts made up 21% of the data analyzed. Throughout the six week period of study, students posed various questions to either all of the participants on the LMS or in response to posts made by specific students. For instance, during the first week, Student 1 posed the following question when she was analyzing biographies and working to create hers (personal communication, March 5, 2013):

Student 1: "Do you think a biography should have lots of pictures?"

Before beginning his research, Student 6 rephrased the topic and asked, "What do you think biographies should have" (personal communication, March 5, 2013)? During the fourth week, another student posed the following question when starting to research a career of his choice (personal communicaiton, April 2, 2013):

Student 3: "Do you think I should pick a job that makes lots of money?"

In response to that question, another student posed a second question that encouraged thinking in another way (personal communication, April 2, 2013):

Student 6: " i think money is important but will you like what you do?"

Some questions were more limited in nature and served to be a staring point for further discussion such as the following post, which also lead to many of the agreeing type of posts (personal communication, April 19, 2013):

Student 2: "Do you like to read fables? I do."

Not all of the questions that students posted were directly related to the topic of the week but possibly stemmed from previous classroom discussions. During the fifth week, students were expected to read web based e-books, but Student 1 asked the following question (personal communication, April 11, 2013):
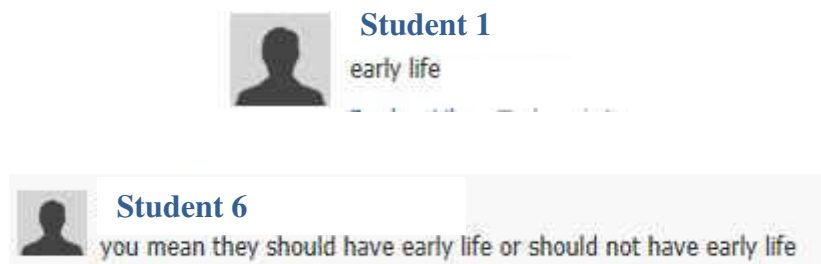
Student 1: "Why do people make up stuff to put on the Internet?"

Upon inquiry from the researcher, the student stated that he was still looking up information about his career because he was absent that day, and he posted to the wrong area.

> **Extending.** The third theme that emerged during analyas was extending, and 10% of the posts analyzed were considered an extending type of post. In some cases the students added information after their orginal post. For instance, Student 1 posted her charactics of fables as follows: "Fables have magic, king or queen, and good and bad." After completing the task assignment for the week which encouraged her to compare and contrast the characteristics of fables and fairy tales, the student added the following post under the discussion board: "I think fairy tales and fables are alike but fables are shorter" (personal communication, March 21, 2013). Another example of extending information was found during the first week of the study. Student 2 stated that he thought that biographies should include the big moments in a person's life (personal communication, March 5, 2013). In response, Student 1 stated, "i agree big moments should be included i also think we should describe the big moment and not write about all of the

moments in life" (personal communication, March 5, 2013). Duirng this time, students were working on writing that focused on "tiny moments" with great detail rather than trying to write about many things with little to no detail, so this student was extending what she had learned duirng writer's workshop to the online discussion of the LMS.

              Clarifying. Students used the posting feature to clarify another student's post, which is the fourth posting theme. Clarifying posts made up 15% of the posts made. Sometimes these posts were posed as a question while others were written as statements. During the first week's discusson of what biographies should include, Student 6 responded to the following post by Student 1 (persnoal communication, March 5, 2013).

Student 1
early life

Student 6
you mean they should have early life or should not have early life

Figure 5. Student discussion post. This figure illustrates a clarifying type of discussion post.

During a discussion about fables, a student commented that fables usually have animals as characters that act like people. Student 1 replied to the post and stated, "The animals have presonification" (personal communication, March 21, 2013). During another dicussion that same week about fairy tales, Student 5 posted that "fairy tales usually have royal characters like a queen or a king" (personal communication, March 21, 2013). Student 4 replied: "Royal is also a prince or princess" (personal communication, March 21, 2013). One final example of a clarifying

post was found in the fifth week. Student 3 stated that he read a book about whales but it did not have a problem or a soution (personal communication, April 9, 2013). The teacher posted a question to the student asking him to think about what type of stories usually have a problem and a solution. The student responded, "fiction has problem and solution", which helped to clarify the type of story he needed to read in order to complete the graphic organzier (personal communication, April 11, 2013). These posts helped to show what a student was thinking, and most of these posts were directly related to the content that was being discussed.

Unrelated. One final type of post that was found throughout the data analysis were those posts unrelated to the topic or idea discussed. Only 6% of the posts analyzed were considered unrelated. While the teacher worked to address unrelated posts throughout the study, students sometimes posted information that was unrelated to the topic. For instance, during the first week, Student 6 posted, "I think we should get start" (personal communication, March 5, 2013). Another example of unrelated posts was found duirng the third week, which focused on career choice. In response to Student 5's post about wanting to become a dance teacher, Student 3 commented, "you silly", which was determined unrleated because it did not engage in further discussion about the specific topic (April 2, 2013). In most cases, the students stayed on topic and did not use the LMS in ways that it was not intended to be used. However, the classroom teacher was very clear with the students that the LMS was a platform for sharing and learning; she also told the students that if they consistently abused the privilege of using the LMS that they would have to take a break from using it and would have to earn their time back.

"Liking" a Post. One particular behavior that stood out was that students often "liked" posts. When analyzing the posts that students "liked", there were no clear connections or no emergent themes between the liked posts. One area that was noted was that many of the students

always liked posts made by another specific student; it appeared that they were liking posts that were made by their friends strictly because they were friends with little to no regard of the post's content. During a think aloud in the fourth week, the researcher was observing a student and noticed that he was "liking" the posts of other students. The researcher inquired about this behavior (personal communication, April 2, 2013):

R: "Why are you clicking like on all of those posts?"

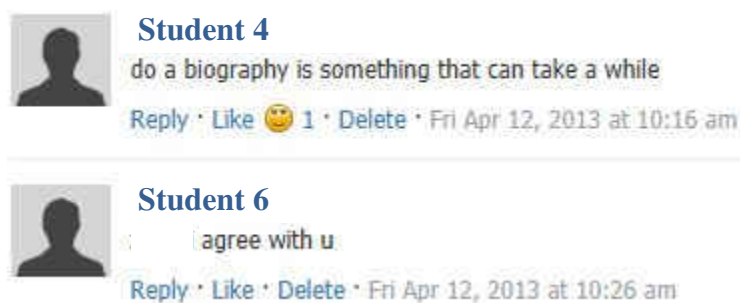S6: "I just like to. I do it on Facebook too."

In other words, it was a common behavior that the student learned from another social networking site and applied to this learning experience. When asked a similar question to another student that was "liking" a post, the student responded (personal communication, March 9, 2013):

S2: "I think [he] had a good idea."

The students' posts and replies varied throughout the research study, and the postings served different purposes. In some instances, students wanted to let peers know that they agreed with their thinking or that they liked their ideas. When students needed information clarified or if they had a question, they used the posting feature to assist them in finding the needed information. The postings were often supportive in nature and provided a means of communication and dialogue among the students and with the classroom teacher. Overall, the students used the discussion board and postings as a spring board to start conversations about different topics, and it allowed each student a platform to share their own ideas and thoughts.

Language. Throughout the researcher, students used a variety of language formats, and often participated in a linguistic phenomenon known as code-switching, which occurs when a speaker alternates between two or more languages or language varieties or when a speaker

alternates between informal and formal conversation according to different a setting or context

(Auer, 1998). When examining the various posts that student made either as a discussion, as an

application or as a response to another post, students very rarely used formal grammar. Students

often used informal language such as writing in fragments and beginning sentences or ideas with

lower case letters. Additionally, they typically did not include punctuation and often wrote in

shorthand. In the instances in which they replied to another post as opposed to creating their

discussion post, responses tended to be very short and limited to a sentence regardless of the

content of the post. The following figure is an example of a student created post and a student

response to that post that serves to show the use of informal language and the use of incorrect

grammar (personal communication, March 5, 2013).

Student 4
do a biography is something that can take a while
Reply · Like 😊 1 · Delete · Fri Apr 12, 2013 at 10:16 am

Student 6
agree with u
Reply · Like · Delete · Fri Apr 12, 2013 at 10:26 am

Figure 6. Discussion post. This figure illustrates the type of informal

language used by students.

Students did not use some of the built in editing features of the LMS such as spell check. In the

dialogue box of the LMS there was a feature that allowed students to turn speech into text, but

none of the students asked to use it. The teacher did have one microphone in the classroom that

could have been used with this particular feature. The following conversation took place between

the researcher and student 3 in response to spell check (personal communication, March 7,

2013).

R: "What does that red line under the words mean?"

S3: "I don't know."

R: "I noticed that you did put a capital at the start of some of your sentences. Why is that?"

S3: "Because it is just a post, like on Facebook."

R: "When you make a post is it different than when you write a paper?"

S3: "Yeah, kind a."

Students crafted and edited their text with the LMS. However, most of the editing was minimal as many of the posts had run-on sentences, sentence fragments, and no capitalization. None of the observed students used a word processing program such as Microsoft Word to craft and edit their posts, although two students did use Microsoft Word to create their biographies during the first week.

It is also important to note that during the first and second week, students created a new post in order to respond to another student rather than using the reply feature. As the teacher noticed this, she directed them to the reply feature during the third week. After that students used the reply feature, which made discussions and replies much easier to follow, as stated by a student (personal communication, March 19, 2013):
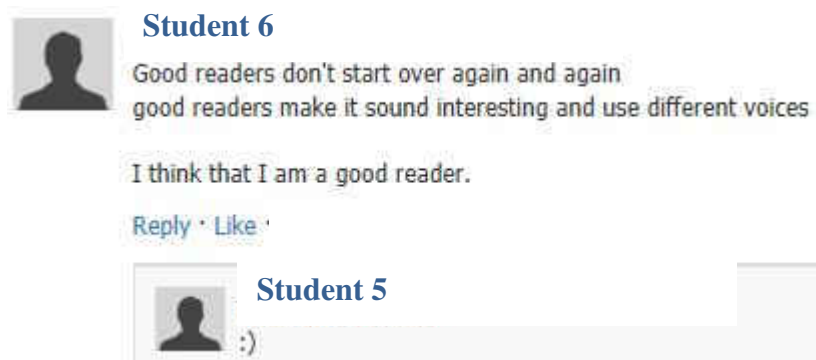
R: "Are you going to respond to S2's post?"

S: "Yes. I want to tell him that I went to a play about fables when I was at my old school and that I like the one about the turtle and the rabbit."

R: "Do you know how to reply to his post?"

S: "I find the post that I want to say something about, and I click this [student hovered over the reply button]. I type it. [Student types the reply: *i saw about fables at my old school the turtle and he rabbit were funny*].

Students also used emoticons, such as ☺, ☹, and <3 as well as acronyms in their response postings. In some instances, students used only an emoticon or acronym as their response. For instance, Student 5 posted the following in response to another student's post about being a fluent reader (personal communication, March 14, 2013):

Student 6
Good readers don't start over again and again
good readers make it sound interesting and use different voices

I think that I am a good reader.

Reply · Like ·

Student 5
:)

Figure 7. Discussion post. This figure illustrates the use of emoticons.

Students also used well known acronyms and shorthand such as the following (personal communication, March 12, 2013):

Student 3
I like that 1 to lol
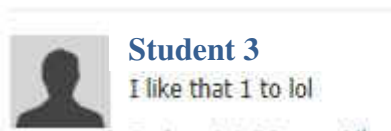
Figure 8. Discussion post. This figure illustrates the use of acronyms and shorthand.

Posts that were in response to the teacher's direct question were often written with more thought about formal language in mind. Although not all posts posed by the teacher were answered, in the cases in which they were the students used more formal language and paid more attention to grammar. The same is also true with most posts that were shared as part of a task or assignment. For instance, the following is an example of a biography post in response to the application or task in which the student used a post to share her learning (personal communication, March 5, 2013):

Figure 9. Discussion post. This figure illustrates a formally written response

to a task.

Although this post does contain misspelled words, it is written using more formal language and

proper sentence structure. The following is an example of students responding to a question

posed by the classroom teacher (personal communication, March 19, 2013).

Figure 10. Question response post. This figure illustrates the type of formal

language used by students when responding to the teacher.

Students used language in various formats and for different purposes. They used traditional text as well as nontraditional text such as acronyms and images to convey meaning. Students also switched between formal and non-formal language practices.

      Conducting On-Line Searches. Through the course of the study, students were expected to conduct various searches on-line. In some instances, the students were given specific sites to research, but in other instances, students were given the opportunity to search for websites that contained the information needed to complete a discussion or assignment task. The theme of conducting an on-line search is important because it has been identified as an important new literacy skill (Karchmer, 2001; Leu, Kinzer, Coiro, and Cammack, 2004; Mills, 2010). The data gathered from this study was collected from the observation time within the classroom. In some cases, a short think aloud was prompted to help the researcher understand how and why a student completed the search.

      When performing a web search, all but one of the students used the popular search engine, Google. The other student used Bing as his search engine. With the exception of S3, all of the students typed in their topic in the main search box and clicked the search link. These students had a large number of related results returned to them, and most of them started by clicking on the first returned link. The following conversation took place between the researcher and student 5 (personal communication, April 2, 2013):

R: "How do you know what website is the best to use."

S: "I just click on them until I find one that I like."

R: "What if you have to go through lots of websites?"

S: "I don't."

R: "Is Google the first place you always go to look for information?"

S: "Yes. Well, sometimes I go to World Book."

R: "When do you use World Book instead of Google?"

S: "When my teacher tells me to."

Student 3 was the only student that conducted slightly different type of search. When Student 3 started to search for his information related to his choice of future career, he used the advanced search feature of Google.

Researcher walked up as student started his search.

R: "How did you get to this screen?"

S: "I googled advanced search."

R: "What does that mean?"

S: "I can pick what I want to search for better."

R: "How did you learn to do that?"

S: "My reach [gifted] teacher."

During the observation time, students mostly clicked on the first link that was returned to them after a search. They would scan the page and decide if it had the information they wanted. However, there did not appear to be a set of behaviors by which they evaluated the website or the information within the site, which will be discussed later.

R: "What are you looking for?"

S: "I am looking up about veterinarians."

R: "Where did you find your information?"

S: "Google"

R: "You used Google to take you to a website to find your information, but what website did you use?"

S: "I don't know."

Students also searched various types of information within databases such as TumbleBooks and PebbleGo. The following describes how students conducted a search in PebbleGo when looking for a biography to study:

R: "What are you working on today?"

S4: "I am looking up about famous people."

R: "What did you use to look it up?"

S4: "We used PebbleGo."

R: "Can you take me back to the beginning to walk me through the steps of how you got to that page about Lewis and Clark."

S4: "Okay. I typed in www.pebblego.com. Then I clicked on biographies. I click on the different people until I found one I liked. We just finished studying about Lewis and Clark. I wanted to learn about a musician, but they didn't have any I liked. I clicked here [back button] and picked someone else."

Within this database each time the student clicked the back button, she was returned to the main screen that included all four databases: PebbleGo Animals, PebbleGo Earth and Space, Biographies, and Social Studies. The student had to go through the process of clicking the correct database, then choosing an area of interest such as artists and musicians, athletes, explorers, history makers, women, inventors, presidents, and African Americans. Next, she had to click on a specific person. During this time, the researcher noticed that there was a link at the top of the page that would have allowed the student to go back to the previous page within the database rather than returning to the main search page, which is similar to a bread crumb type of trail. However, the student was not aware of this feature and continued to use the back button in

the browser. Another student being observed explained to the researcher the two ways that she

searched within the database:

R: "Did you already know who you wanted to read about before you got here [PebbleGo]."

S4: "I wanted to read about Demi Lovato. She wasn't there."

R: "Where did you look for her?"

S4: "Under music [musicians]."

R: "Is there any other way for you to search for her?"

S4: "You can type her name in up here [points to search box]."

R: "Did you do that?"

S4: "I don't know how to spell her last name."

The researcher did observe another student using the search box to find information, while she

was working with the previous student. After asking the student to retrace his steps, Student 2

showed the researcher how he typed in "George", and a list of various people within the database

appeared. He found the one he was looking for among the list, which was George Washington

Carver, and click on his name.

R: "Did you already know who you wanted to look up?"

S2: "Yes."

R: "Did you notice what happened when you started to type his name?"

S2: "It started to fill it in for me."

R: "Yes. That is a helpful tool, isn't it."

S2: "Yes."

Students had varying degrees of searching knowledge, and they often went about

conducting searches in different ways until they located the information they wanted. During the

observation time, the researcher noted that most students conducted searches independently with little to no help from the teacher or other students. However, the effectiveness of their searches was not measured as it does not serve to answer the research questions of this study.

Lack of Browser Knowledge. As students navigated through the massive amount of information, few of them had a broad knowledge of using a browser. During the first observation session, the teacher asked the students to open their Internet browser and type in the LMS site, which was written on the board. One student asked:

S: "What is that?"

T: "What is what?"

S: "What you said?"

T: "Oh, the browser. Who knows what a browser is?"

Three students raised their hands.

S: "Like Chrome or the blue E."

T: "Yes, the browser is what you use to get you to the Internet."

S: "Oh, like Google?"

T: "No, Google is a search engine that searches the Internet. Google makes a browser, which is called Chrome."

In at least two instances, a student opened the web browser and navigated to the Google search page. Next, they typed the web address in the search bar rather than the address bar. Once the results were returned, the LMS site was the first link, but the students raised their hand because they did not know to click on that link. According to the students, they thought that typing the address into the search bar would take them to the page rather than return a list of results.

Furthermore, students struggled when working with more than one browser window opened. In some cases, students would click on a link within a webpage, and the new page opened in a new window. When the students wanted to return to the main or first webpage, they were unsure of how to navigate back to it since it was not part of the window in which they were working. The teacher showed the students how to "read" the bottom of the taskbar to determine the number of windows open and how to click on them to maneuver between various windows. During this time, at least one student "moved" the taskbar from the bottom of the screen to the side; both the teacher and the student were unable to pick up the bar and move it from the side back to the bottom.

Another issue that arose while using the browser to conduct searches was the use of the "tab" feature. When students wanted to open a new webpage, they typically clicked on the browser link from the desktop rather than using the tab in the browser with which they were already working. Students knew how to navigate to the Internet through one of the two web browsers that were installed on the computers.

Images. One category that was highly searched for during on-line web searches was images. This particular behavior was most apparent during the biography and career weeks; however, at least one student conducted an image search for fables, because according to the student, "I don't like to read. I like to look at pictures betters and pictures can tell a story too." One student in particular easily navigated to the main Google search page, typed in her search topic, and clicked on the images tab once the results page was displayed. As this particular student was creating her biography in Microsoft Word, she inserted various pictures that she located on the Internet. Another student noticed her working, and asked her to show him how to

find pictures, which she did. Upon noticing this, the researcher asked the student how she knew

how to find and add pictures into Microsoft Word:

S1: "I use Word at home. I like to type stories and put in pictures. My mom and older brother

help me sometimes."

R: "Do you always find pictures on the Internet?"

S1: "No, sometimes I use clip art, but I like the real pictures better."

R: "Do you ever use Word to help you with school projects?"

S1: "Sometimes. I don't have many school projects other than homework."

Students often asked if they could find pictures related to different tasks. For instance, one

student asked the teacher if he could find a picture of a truck driver to post; the teacher stated

that she was not sure if he could attach just a picture as a post but that she would check on it for

him. The teacher found it was possible to attach an image, but when she told the student, he was

working on a different task and did not go back to add the picture.

       Text. Not only did students use the Internet to locate pictures but they also used it

to find information related to a specific topic. During on-line searches, students were not always

given the specific terms to search for; rather, they were given a broad idea, such as career, and

students were expected to figure out their keyword searches on their own. When students were

asked to locate information, they tended to scan text to see if the information presented was

useful or not. It was also noted that some students tired easily of reading lengthy information on-

line. When the researcher noticed one student continually clicking on various websites when

searching for information related to football player, she asked him why he kept changing sites.

The student responded that the page had too much information on it. The researcher further

asked if the student liked the way that PebbleGo presented the information, and the student replied that he did like it better because there weren't so many words and it read to them.

Locating and Evaluating On-line Information. Throughout the course of the study, students were expected to conduct various web searches to locate information that was pertinent to their topic. During some weeks, students were directed to use specific sites, but other weeks were open to allow students to individually locate information from the Internet. At the beginning of any discussion that required students to locate information on-line, the classroom teacher reminded the students about finding "good" information. The following conversation took place during the classroom setting before the fourth week.

T: "This week you have to find information about what you want to be when you grow up. You will use the netbooks to go to the Internet to find your information. What have we talked about finding things on the Internet?"

S: "You have to be careful."

T: "What do you mean?"

S: "Anybody can put anything on the Internet."

T: "Right. You have to be careful about the information you find to make sure it is "good" or "quality" information. What are some websites that we want to stay away from?"

S: "Wikipedia"

T: "Good. What are some places that we have used before?"

S: "World book"

S: "Pebble Go"

T: "Do you guys remember the conversation we had with [Media Specialist] about looking at how sites end to determine if they are good or not?"

S: ".com sites aren't always good."

T: "Right, we can use .com sites, but there are other choices that might be better or more trustworthy. Let's try to look at sites and use the ones that end in .edu, .gov, or .org. [The teacher wrote these on the board.] If you don't have any questions, let's get started."

Although previous direct instruction had been provided for students conducting research on animals, students, at that time, were given specific websites to use to find their information such as World Book On-line, Encyclopedia Britannica and PebbleGo. Hence, it was helpful to observe students as they conducted on-line searches to determine how they chose sites from which to pull information. The researcher sat and observed Student 3 during week 3 while he tried to find information about becoming a police officer. When prompted, he stated that he wanted to be a police officer so that he could help others, could carry a gun, and drive fast. The student first typed the key words "police officer" in the Google search bar. The first result that was returned was from the popular website, Wikipedia. The student clicked on the link, and the researcher started asking questions.

R: "Why did you click on that page?"

S3: "It was the first one."

R: "Do you know what site this is?"

S3: "Um…[student glanced at the webpage], oh, it is Wikipedia."

R: "Do you think that is a good place to get your information?"

S3: "No, we aren't supposed to use it. [The student clicked back to the results page.]

R: "So, what is it that you are really looking for?"

S3: "I want to know about being a police officer."

R: "Would it help to know more exactly what you want to know. Like, do you want to know how much they make or what type of training you need or what exactly different officers do?"

S3: "Yes. I want to know that stuff."

Upon returning to the results page, the student typed in keywords that were more specific such as "how much do police officers make". He continued to click on the first link that was posted to the results page throughout his various searches. At this time, the researcher wanted to understand why he continued such behavior or if he understood how to "read" the results page.

R: "Why do you click on the first link every time?"

S3: "That is just what I always do."

R: "Well, do you remember those important endings that your teacher put on the board like .gov and .org?"

S3: "Yes."

R: "Do you know how to tell what type a page a website is?"

S3: "I can click on it and look up there [address bar].

Rather than "reading" the links on the results page, the student would click on the page to determine the domain of the webpage. The researcher observed this similar type of behavior throughout the cases; however, one student did use the student version of World Book Online to help locate her information. The student did not use the "text to speech" option but read the information herself; however, she did not continue reading to the end of the page nor did she use the shortcut links by topic provided on the left of the webpage. Although the site did not give her all of the information she needed, she did take some notes from the first few paragraphs from the site and then went to Google to complete her search. Again, she exhibited a similar behavior in that she would click on the first link and scan to see if it had the information she was looking for.

If it did, she would take notes; if it did not, she would return to the results page and click on the next link. The student did not record any citation information or the name of the websites she used to get her information.

The students accessed the Internet to find various types of information, which included text and images. In some instances, students also viewed videos within web pages that contained important information about a topic. Throughout the research study, students had opportunities to use the Internet to locate web sites and information that was pertinent to their topic of study, but in other instances, the teacher directed students to specific websites. The students used two main web browsers to access the Internet, and the students used two search engines, Google and Bing.

Sharing Created Files. Throughout the study, students had opportunities to share created files and documents. In some instances, students were not able to share files such as applications that they completed with paper or pencil or applications that were created within programs that prohibited file sharing. The teacher showed the students how to upload files during the first week; throughout the study, students did not ask for assistance with uploading files other than on one occasion when S5 could not remember where she had saved a file. During a think aloud with S6, the researcher asked how he knew to upload a file. The student responded that he remembered from the teacher showing him.

During the second week, students were expected to complete a web of the qualities that define a fluent reader and the qualities that define a non-fluent reader. A blank concept web was created in Adobe for students to fill out. This web was uploaded to the LMS, and students were expected to save two copies of the file, of which one web was used to describe traits of struggling readers while the other was used to define traits of a fluent reader. After clicking on links provided to them in the LMS to listen to different readers, students compiled a list of

behaviors related to the two different types of readers and completed their concept web. Next,

students were expected to upload their webs for other students to view and discuss. Below is an

example of the posts shared by Student 4 and Student 5 as well as the web that was created by

Student 5 and shared on the LMS:

Figure 11. Sharing files. This figure illustrates the files uploaded and shared in the

LMS by two students.
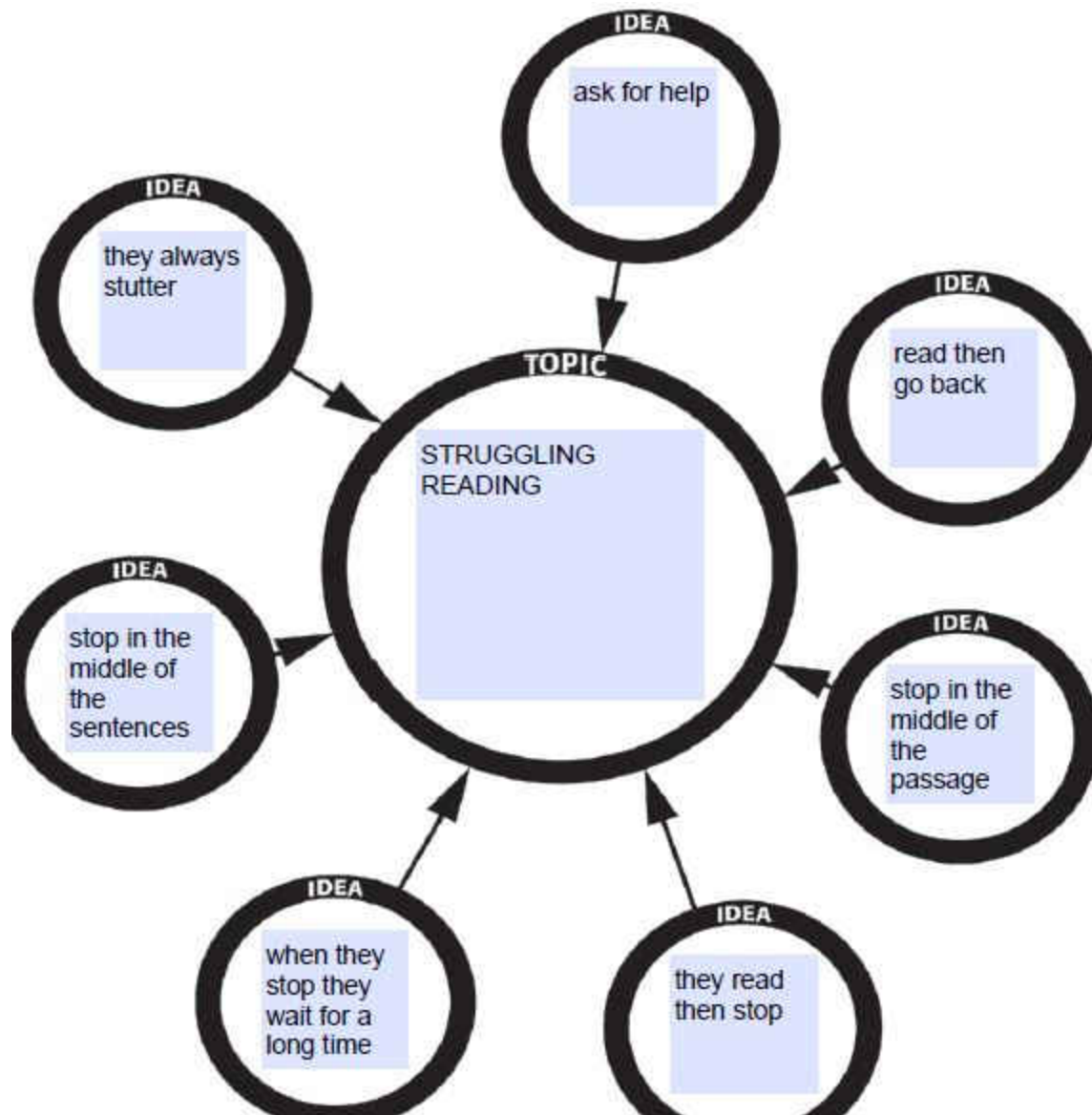
Figure 12. Struggling readers concept web. This figure illustrates a student's completed concept web.

Another example of file sharing took place during week 3, when students created a Wordle to share their findings of both fables and fairy tales. Before this application, the teacher explicitly showed students how to create a Wordle. The teacher showed the students a "cheat sheet" of tips to make a Wordle more personal such as changing the size of the text and formatting the font and color; first, the teacher created a list of myths the students had studied

along with some characteristics of myths using Microsoft Word. During this time, the teacher

asked for student input related to what they already knew about myths. She showed students how

to copy and paste their list from Microsoft Word to the Worldle page using the control c and

control v keystrokes. One student added that the teacher could have clicked on the text and

chosen "copy" and then chosen "paste" in the Wordle bar. With the assistance of the teacher,

Student 5 shared her Wordle's through uploading a link to each of them. The following figure is

an image of the Wordle that she created about fairy tales. The second figure is related to fables.

Figure 13. Fairy tale wordle. This figure illustrates a student's concept of fairy tales using the

web 2.0 tool, Worldle.
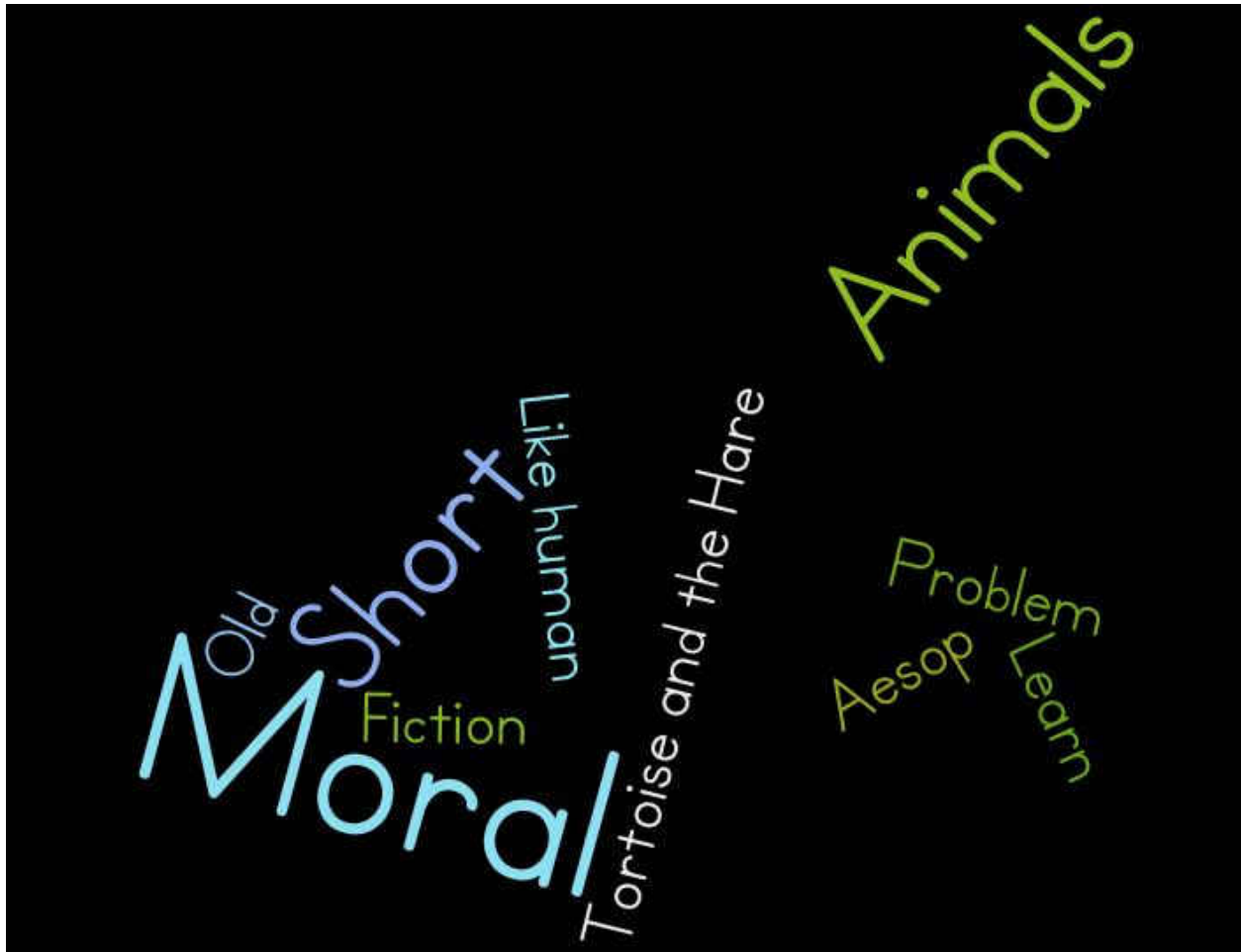
Figure 14. Fable wordle. This figure illustrates a student's concept of fables using the web 2.0 tool, Worldle.

In comparing the two images, the student was able to manipulate text size, font, direction and color. Although the teacher had provided a basic overview of creating a Wordle, the student was able to make changes that were not previously discussed. The following think aloud took place after the student posted her Wordles.

R: "How did you get the words to go in different directions?"

S5: "I just click on these different things [pointing to the toolbar within the program] and saw that you could change it. I kept changing it until I found one I liked."

R: "Did you do that with anything else?"

S5: "Yes, I changed the color a lot of times."

Two students also shared their biographies, which were created in Microsoft Word and uploaded as an attachment in the post. Additionally, students were expected to share their graphic organizer during the fifth week. In each of these examples, students created a post and attached their files to the post. In order to view the attachments, users had to click the attachment and open it in the program in which it was created.

The ability to share files was important as students were often given various choices on how to respond to tasks. Students who used a paper and pencil type of response were unable to share their files with the other students because the school did not have a working scanner. Additionally, the skill of uploading files was one that the students were not familiar with prior to using the LMS, but after having practice during week 1, 2, and 3 students were able to easily upload their graphic organizers during the fifth week without any assistance from the teacher.

Shared Learning. Throughout the course of the study, students had various opportunities to gain insight into other students' learning through postings and shared files. As previously discussed, most students did not read posts to broaden or deepen their own understandings. However, students did use the LMS to support the learning of others by either agreeing with their shared ideas or to encourage thinking through posing questions. Although the teacher's posts were not included in previous analyses have not been discussed, the teacher played a major role in encouraging shared learning through the LMS. The teacher would often post questions and encourage deeper thinking, which sometimes encouraged other students to think more about the topic.

Comments

Student 2
i think a biography lots of facts about you

Reply · Like · Delete

> **Teacher**
> What do you mean "lots of facts"? Be more specific.
>
> Like · Delete

Student 1
me too

Figure 15. Discussion post. This figure illustrates a teacher's questioning to help extend and refine thinking.

In response to the teacher's question, the following students added:

Student 5
i think that information on someones life makes a biography also i think information about somebody should be included in a biography

Reply · Like 😊 2 · Delete

Student 6
i say that all biography shound have he or she's biggest moment

Reply · Like 😊 3 · Delete

Figure 16. Discussion post. This figure illustrates student responses to the teacher's question.

It is important to note that not all of the shared learning took place within the LMS. Much of the shared learning by students took place during classroom discussions in response to technical questions or issues posed by students. In these instances, much of the learning was the result of instruction by the teacher, but in some cases, students relied on other students to help solve problems. For example, when one student was not sure of how to locate pictures to add to his biography, he asked another student that he had noticed had successfully added images to her biography to assist him. During the second week, S2 was not sure where to save his concept web,

so he asked S5 to assist him. S5 showed S2 how to navigate to the student folder on the shared drive and how to name the file since he would have to have two versions.

The teacher addressed technical issues that arose throughout the course of the study in a whole group setting. For instance, when the teacher noticed that students were posting with little to no concern about spelling, the teacher used the projector and laptop to show students how to type in Word and fix spelling errors by right clicking on the words with the red line underneath them. The teacher also showed the students how spell check was a feature embedded in the technology when they post, so when they see the red line under a word while they are typing a post, it means the word is not spelled correctly and they can fix it by right clicking and choosing the correctly spelled word from the list provided.

Multimedia. Throughout the six week period, students were given opportunities to use various sites that included multimedia such as videos, text to speech, hyperlinks and games. During the first week, students were asked to use an on-line database, PebbleGo, to explore biographies. This site reads information to students and presents information in ways that is easy for students to understand. Rather than presenting information in a long list with headings, PebbleGo uses heading tabs and only presents a brief amount of information under each tab. Additionally, students can view a short video and a glossary of terms is provided so that students can click on highlighted terms that may be unfamiliar and the definition is presented within the page. During the observation time, all six of the case study students clicked on the video provided and at least three students utilized the glossary feature. When asked if students liked using this database or a similar one such as World Book, Student 2 stated that he liked PebbleGo better because the voice reading the information did not sound like a computer and because it was easier to understand.

During the fifth week, students were given the opportunity to read stories from an on-line database, Tumblebooks. This particular site presents popular children's books in a multimedia format through text, music, pictures and games. In order to encourage active participation, the teacher did not assign specific stories for students to read, but she allowed them to choose stories that were of interest to them. According to Student 2, "I like Tumblebooks because it reads it to me and is just like the real book." Student 6 stated, "I like reading books on the Internet because it is more like a movie."

Students used various multimedia tools throughout the research project. Students were easily able to access videos and play them back as needed during the second week. Students used Raz-Kids to record themselves reading a section of a story in order to evaluate their fluency. After direction instruction in using Wordle, students were able to create vibrant, informative Wordles. Within different websites, students interacted with books and non-fiction information through text, videos, games, and glossary links.

Word Processing. Throughout the course of the study, students had many opportunities to access and utilize word processing programs such as Microsoft Word. Although many students did not use these word processing applications to create their posts, some students did use the program for other assignments and tasks. Because many of the students were unfamiliar with Microsoft Word, the teacher provided mini-lessons on different skills, such as the copy and paste feature. The following conversation that took place during a think aloud session with Student 3 describes a student's reasoning behind crafting a post rather than using a different application to present his biography.

R: "Tell me why you decided to post straight to the web and not use something else to create your story."

S: "I don't know what to use."

R: "That is okay. Your teacher said it was fine to write it out and post it on the website."

The researcher observed as the student opened the LMS, logged in and navigated to the assignments page.

R: "Why did you click on assignments and not on discussions?"

S: "We are supposed to put what we think on the discussion page and what we do on the assignment page."

R: "Oh, thanks for explaining that to me. So, what will you do now?"

S: "I have to click here (clicked on the "Assignments tab") and then I click here (click on the "All About You" tab).

R: "So, how do you make your post?"

S: "I just type it in here and click post."

During the first week, two students used Microsoft Word to create their biographies. As students progressed throughout the research study, after various mini-lessons, and after learning from other students, some students started to develop their word processing skills and began using different features. After evaluating the artifact data, the researcher noted that student 5 used different size fonts throughout her biography. She used a larger font for the title of her biography and a smaller font for the body of her biography. Student 4 also used Word to create her biography. She used a variety of font colors and font types throughout her biography; however, she did not change the font size. Although the students used Microsoft Word to compile a list of defining terms related to fables, most of them strictly used the program to type text; however, they all used the copy and paste feature as was demonstrated by the classroom teacher during a short, direct instruction lesson.

Students had different understandings of word processing and using specific word processing programs. Through conversations during the think alouds, the researcher learned that some students had a stronger knowledge base because of previous experience, and some students

had little experience using these types of programs. During this study, all of the students had at least one opportunity to use a word processing program, and all of the students used keystrokes to help to help them work more effectively.

Lack of Out of School Usage. Upon analyzing the artifact data, the researcher noticed that most of the postings took place while the students were logged onto the LMS during class hours. Students logged on throughout the day and at times that were not specified for Schoology. For instance, the teacher reported that many of the students tried to log into the LMS during their computer lab time when they were supposed to be working on CRCT practice skills. However, students rarely logged onto the LMS at home and posted questions. However, Student 1 and Student 4 did make posts outside of school hours during the first two weeks, but they did not continue this behavior throughout the duration of the study. Student 1 posted a question about biographies at 6:11 p.m. and responded to a post at 6:15 p.m. Student 4 made posts outside of school hours during weeks 1 and 2.

Throughout the study, the researcher asked students about their use of technology outside of school. These conversations took place during the think aloud sessions and usually related to what the student was completing and whether or not the student used similar programs or technology at home. Students reported that Internet access was usually limited to smart phones; however, three students did have Internet access through another device besides a phone.

Communication and Interactions

As previously described, the ability to make and respond to posts through the LMS encouraged different types of responses among the students, and the types of posts made by students to one another has been addressed. Approximately 225 posts were made throughout the six week period by the classroom teacher and the six case study participants. As exemplified in

the number of posts made, students were given the opportunity to see other students'

understandings and ideas; however, the researcher was not able to fully determine how and if

students utilized the posts to deepen their own understandings or to learn from the posts among

the participants, but from the data gathered and previously described, the students were engaged

in on-line learning.

The classroom teacher used the LMS to share ideas, pose questions, and provide

feedback to each of the six students. The classroom teacher made over 75 posts throughout the

period; she was very intentional to respond to each student on a weekly basis. During the

discussion, the teacher would use the LMS to ask students' questions that would help them either

deepen their own understandings or to help her better understand their thinking. The teacher

would often provide feedback during the task phase of the study, since many of the students were

completing assignments. Students often only answered questions that were posted under their

personal post; in at least three instances, another student also posted to answer the teacher's

questions. However, students' tended to strictly reply to the teacher's posts if it was directed

toward them personally. Also, students did not direct any posts to the teacher specifically. If they

had a question or an idea, they would post it on the board without addressing it to a specific

person. In other words, the students expected to receive answers from either the teacher or peers

or both.

Access to ICTs

It was important to this research to understand how students use and access ICT's outside

of school to better understand how these technologies either are or are not supported in their

lives, which helped to answer the fourth research question. Since much of this study focused on

economically disadvantaged students and their use of new literacy skills, this research wanted to

specifically understand these students access technology and how technology is used. For this portion of the study, the researcher surveyed 60 fourth grade students, although only 55 surveys were analyzed because five the surveys were incomplete or unreadable. The first component of this survey (Appendix A) served to understand how much access students had outside of school. For the purpose of this study, students were asked to answer "yes" only if they were allowed to use the computers or devices to access the Internet. If they had a computer at home but their parents did not let them use it, they were asked to respond with "no". Furthermore, students were asked to think about whether or not their computer could access the Internet since many of the students said they had computers at home but could not get on the Internet because of financial or technical reasons. The following chart represents the number of computers that students stated were connected to the Internet at their home. For the purpose of the study, a computer was identified as a desktop or laptop; tablets, gaming systems and phones were considered to be "other devices".
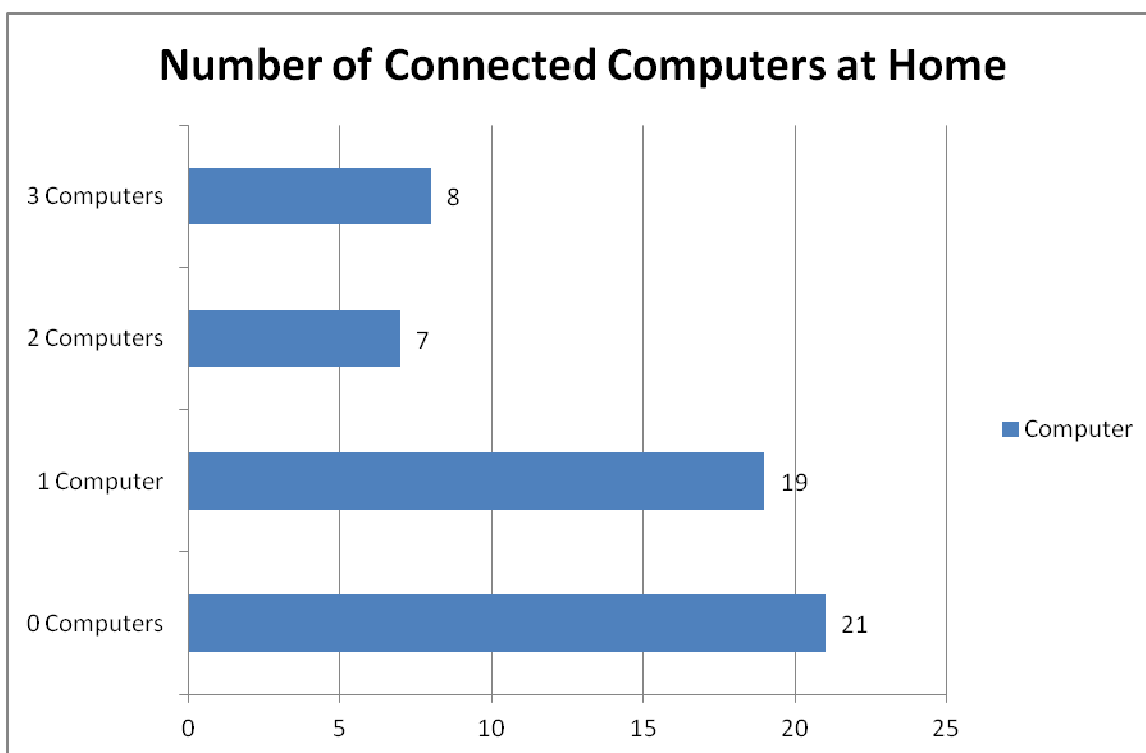
Figure 17. Number of connected computers at home. This figure describes how many computers have Internet access in student homes.

According the survey, the majority of the 55 student participants did not have access to the Internet through a computer. Thirty eight percent of students reported that they have zero computers that are connected to the Internet, 35% of students reported have at least one computer that could access the Internet, 13% stated that they had two computers that would connect to the Internet, and 14% said they had at least three machines that would access the Internet. This study did not identify the students that had absolutely no access to the Internet through either a computer or another device.

Since computers are no longer the sole device for accessing the Internet, students were also asked to identify if they had another device such as a tablet, an iPad or iPod, a phone, or a gaming system to connect to the internet. The following graph shows the number of students who stated they did have another device to connect to the Internet. According to the data, 65% of students reported having access to the Internet through at least one other device other than a computer, and 35% of the respondents reported that they did not have another device that could access the Internet.
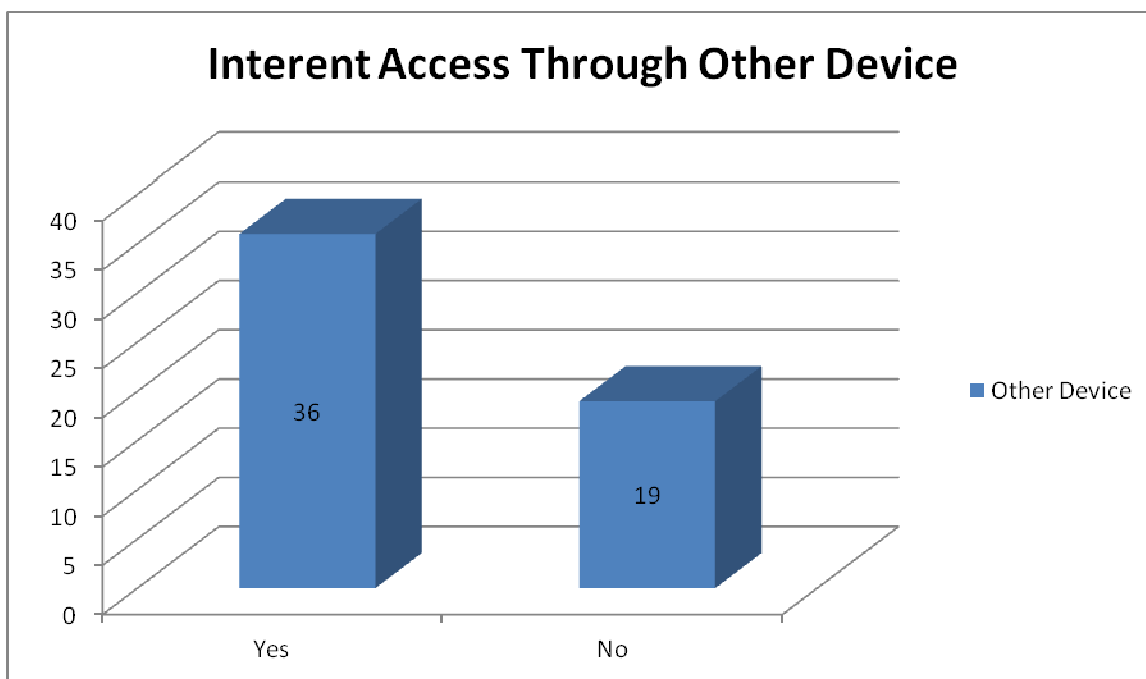
Figure 18. Internet access through other device. This figure describes whether or not students have Internet access in their homes through other devices.

Students were also asked to identify where they access the Internet the most. According to the survey data, students mostly access the Internet at school, but many of them also use it at home or outside of school. The following graph provides an overview of the student response to where they most access the Internet. Of the students surveyed, 56% of students identified school as being the place that they access the Internet the most and 44% replied that they accessed the Internet more outside of school through home or another location such as at friends for family members' homes.
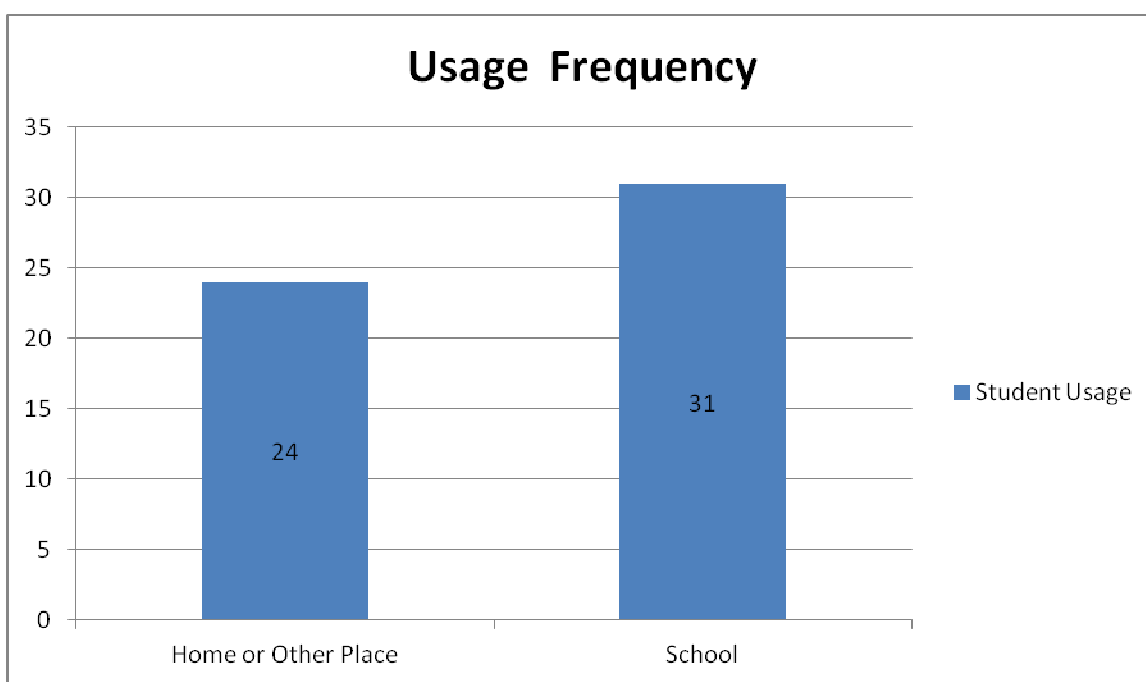
Figure 19. Place of usage frequency. This figure describes where they use the Internet most often.

To better understand how students use the Internet, participants were asked to identify the frequency with which they engaged in various on-line behaviors. On-line behaviors included

using the Internet to chat or instant message, accessing social networking sites, downloading music, watching videos, reading about sports, actors or musicians, finding pictures or clip art, leaning about personal areas of interest, completing school related assignments, buying thins, playing games and practicing for the CRCT. The following chart describes the findings in order to identify the percentage of students enaging in the various types of behaviors:

Table 7

Frequency of Internet Behaviors

Behavior	Never	Less than once a week	Once a week	A few times a week	Once a day	Several times a day
Chat/Instant Message	36	0	0	4	0	15
Access Social Networks	30	6	3	7	9	0
Download Music	9	21	9	7	3	6
Watch Videos	6	3	0	45	0	2
Read about Sports	48	3	2	2	0	0
Read about actors or Musicians	39	6	0	10	0	0
Find Pictures or Clip Art	21	18	9	5	0	2
Learn about Things that Interest me	4	8	11	25	5	2
School Related Assignments	0	10	9	26	8	2
Buy Things	53	2	0	0	0	0
Play Games	0	0	3	4	1	47
Practice for the CRCT	2	0	4	21	22	6

The most popular behaviors that occurred more than once on a daily basis were playing games on-line (85%) and chatting or instant messaging (27%) with friends. Less significant behaviors that were infrequent throughout the day were using the Internet to download music, watch videos, practice for state tests such as the CRCT, and reading about areas of personal interest. Since the survey did not ask respondents to identify if these behaviors mostly took place at home or at school, it cannot be determined where these behaviors most often take place.

When analyzing the behaviors that took place on a daily basis, the majority of students stated that they used the Internet to practice for the CRCT. At the school in which the study was conducted, students visit computer labs at least five times a week for a forty minute period to work on skills needed to pass the state mandated test. Programs such as SuccessMaker, Study Island and Georgia On-line Assessment are used during their computer lab time. The labs are not used to help students develop computer skills and students rarely have time to complete activities other than the ones previously described. Use of the Internet to access social media sites and to complete school related assignments made up 16% and 15%, respectively, of the population response. In looking at the behaviors that take place a few times a week, the most significant one was related to using the Internet to watch videos or movies in which 58% of the respondents' replied with a yes.

To better make sense of the data, the researcher looked at behaviors that occurred at least once a week and as much as several times a day. The behaviors are divided into three categories according to the percentage of students engaging in different behaviors as detailed by the data: significant, moderate, rare. The following behaviors are considered significant because 70% or more of the participants engaged in them at least once a week: playing games (100%), practicing for the CRCT (96%), watching videos (85%), completing school related assignments (81%), and

reading about things of personal interest (78%). Moderate frequency is comprised of behaviors that took place by more than 30% of the respondents but less than 69% of them. These behaviors include using the Internet to download music (45%), accessing social media sites (35%) and chatting or instant messaging (35%). Finally, the rare frequency behaviors that took place at least once a week in less than 29% of the respondents were finding pictures or clip art (29%), reading about actors or musicians (18%), reading about sports (7%), and buying things over the Internet (0%). The rarest behaviors, which either do not occur or occurred less than once a week, according to the survey data, were buying things (100%), reading about sports (93%), reading about actors or musicians (82%), and finding pictures and clip art (71%). Students did not identify where these behaviors took place when they did occur.

The previously described behaviors were a small sample of behaviors that students may engage in when accessing the Internet; these specific behaviors were chosen by the researcher because they had previously been observed throughout the researcher's professional career as a media specialist and these behaviors were also identified through the previous literature. Additionally, these behaviors were chosen because of the age of level of the participants.

Summary

Through the context of a digital learning management system, this research study helped the researcher to understand the new literacy practices of economically disadvantaged students. Data from the observations and think aloud session were coded according to emergent themes in order to identify new literacy skills. Through the use of a digital learning management system (LMS), students participated in discussion board topics and utilized new literacy skills to respond to assignments, discussions and tasks presented to them through the LMS. Students encountered

a variety of opportunities to display and expand these new literacy skills, and analysis of the data

revealed the new literacy skills that were practiced or developed by the students throughout the

study. These skills include participating in on-line discussions, searching for information on-line,

sharing created files, engagement in multimedia websites, use of various types of language,

exploring Internet browsers, and exploring word processing applications. Furthermore, analysis

of the posts revealed that students used the posting feature to extend, clarify, question, and

support their learning as well as the learning of their peers.

The teacher and researcher designed, developed and integrated a variety of discussion

topics, assignments and tasks for the students to access through the LMS. This researcher sought

to understand the levels of learning that were encouraged through these discussions and tasks.

The levels of learning were based on Bloom's taxonomy and identified the level of cognitive

complexity of each discussion and task. The researcher revealed that many of the discussions and

tasks did require higher level thinking skills.

This study also explored how learning was shared among students through on-line

discussions and face-to-face learning in the classroom. Not only did this study help to identify

the ways in which learning was shared but it also helped the researcher to identify the social

aspect of learning that takes place within the physical classroom through the use of an on-line

learning management system and ICTs. Finally, this study allowed the researcher to better

understand how economically disadvantaged students use the Internet and where they most

access the Internet. This research study sought to understand the access and use of the Internet by

economically disadvantaged students in informal environments. Through survey researcher, the

data described a lack of Internet access and usage among the socially and economically

disadvantaged students in this study. Additionally, the data revealed that when the students in

this research study used the Internet they typically accessed games, videos, sites of personal

interest, and CRCT practice sites.

CHAPTER 5

IMPLICATIONS

Discussion

The study examined how the integration of technology can support the emergence of new literacy skills within the context of a digital learning management system. Fourth-grade students participated in on-line discussions as well as a number of web based tasks and encountered multiple response opportunities including the use of threaded discussions, response activities, and web 2.0 tools. The purpose of this chapter is to discuss the findings and recommendations concerning the results of this study. The chapter begins with a summary of the study, followed by a discussion of the findings, limitations of the study, implications for classroom practice, and recommendations for further research.

Summary of the Study

As technologies continuously emerge around the globe, today's students need and deserve the skills, strategies, and insights to effectively utilize the new literacies and information and communication technologies (ICTs) both within and beyond the classroom walls. For teachers and students alike, it becomes increasingly important to understand and foster the literacy skills that these ICTs demand. Leu, et al. (2005) caution against viewing the rapid infiltration of ICTs as simply a technology issue – rather it is an essential literacy issue. According to Thomas et al., 2007, the new literacies bring together all of the literacy modalities including print and digital literacy and work to understand the roles these literacies play. Hence, it is imperative that today's educators and school leaders consider new methods of effectively integrating the new literacies into classroom learning. According to the International Reading

Association (2002), educators have a responsibility to ensure that students are prepared for a

literacy and technology rich future, and in order to meet such requirements, teachers must be

able to integrate not just technology but also the new literacies throughout the current

curriculum. Beers (2004) noted that educators must ensure that students are given meaningful

opportunities to engage in and with technology as well as with the new literacies. However,

many educators, including literacy teachers, have not been successful at merging technology

with their classroom practices and have been rather slow to embracing the opportunities that

technology offers to learners (McKenna, 2006). In addition, Cuban (2001) reminds us that

technology alone does not guarantee quality instruction. This study integrated various

technologies through a learning management system (LMS) into a fourth grade language arts

classroom in which students learned, sought out information, and shared key ideas and

understandings. The use of a digital learning management system served as a framework used by

the researcher and educator as they sought to intertwine the new literacies and technology within

a traditional literacy classroom. Because the classroom teacher allowed the students to explore

various concepts and encouraged them to define broad terms, this study supported the ideals of

constructivism. In constructivist terms, knowledge is not created in a vacuum but it is greatly

impacted by students' social and cultural environments (von Glasersfeld, 2005). Constructivist

theorists argue that students should be given various experiences in which they can construct

knowledge rather than being passive recipients (Gredler & Shields, 2010; Schunk, 2012), and

through interaction, exploration, equilibration, and scaffolding of knowledge construction within

the social world, learners construct meaning throughout these processes (Bruner & Ratner, 1978;

Piaget, 1977, Vygotsky, 1986). Throughout this research, students were given opportunities to

construct their learning through scaffolding and through interactions with others.

The purpose of this mixed methods multiple case study was to examine how the integration of technology supported existing and emerging new literacies within the context of a learning management system. The study was conducted in a fourth-grade classroom at an elementary school in Georgia between March and April, 2013. As part of the study, 24 students in the classroom participated in the LMS, but the data collection and data analysis focused on six selected student participants. This study also focused on how students access technology and what behaviors they most often engage in when using the Internet. For this focus, 60 fourth-grade students at the same school, including the 24 students in the LMS integration class, responded to a survey that provided data about Internet access and usage; however, only 55 of the surveys were analyzed.

As the fourth-grade students participated in on-line discussions, they used a variety of new literacy skills to support the learning and sharing processes. Furthermore, the students encountered distinct opportunities to respond to discussions and web-based learning activities. First, by using on-line discussions, the students engaged in spontaneous responses as the discussions emerged over the six week period. Next, the LMS allowed for a safe space for students to respond to the teacher-constructed discussion and tasks. The students composed and posted their own discussions, which often elicited a variety of responses from their peers and teacher.

Throughout the study, multiple sources of data, including audio-recordings, digital artifacts, observation notes, think alouds, and survey responses, were collected. Using qualitative methods, the data was inductively analyzed to explore the emergence of new literacies as technology is integrated into a fourth grade language arts classroom. Findings of the study

suggest that technology integration supports the emergence of new literacies, while the new literacies support students' utilization of available technologies.

Findings

Within the context of a learning management system, data were gathered, organized, and analyzed around four distinct research questions. Findings for each of the four questions will be presented.

What level of learning, as specified by Bloom's taxonomy of learning, is supported in the design of on-line learning? Although the data represents that many of the discussions and tasks required higher order thinking skills, it is important to note that the teacher designed these and that the LMS did not inherently create a learning environment that encouraged higher level learning. The LMS did however allow the teacher to integrate various on-line resources into an organized central location, which allowed for structured threaded discussions. According to Friedman (2006), current technologies allow users to learn from multiple sources, which may include several view points and contexts, as well as with users from around the world. Upon reflection of the study, the classroom teacher stated,

> I really liked that I was able to gather various resources and put the information on the website, and students could assess it on their own and as needed. I think it helped them to work at their own pace and allowed them time to develop their thoughts and ideas. I also think it made it easier for them to create a product. I did not feel that I was the only one responsible for the information. I think it gave them [the students] some ownership.

In addition, the fact that the LMS was hosted on-line meant that students had to use computers or a technology device and were therefore given access to a variety of on-line information

throughout the course of the study when they were logged into the site. Traditional learning in this classroom does not require students to use computers other than assessment websites, so they would not have many opportunities to learn on-line since such learning is not often utilized.

The data revealed that many of the levels of learning did require higher order thinking skills, which is related to the fact that students had access to various tools to create different types of products. Throughout the study, students were responsible for using the provided resources to construct their understandings of big ideas. Students were able to learn from various on-line resources in order to increase their knowledge base of a subject, and students were expected to use that knowledge to create some type of product. The tasks, discussions and assignments were not limited to the basic recall of information. Because the teacher was able to incorporate various resources from the Internet and students were given opportunities to work at their own pace, the design of the learning was able to support higher levels of thinking. In addition, the availability and variety of ICTs allowed the teacher to create tasks that required students to use their knowledge to produce an artifact of learning rather than remain passive recipients of learning.

What new literacy skills are practiced by students as they engage in on-line discussions? Previous research described students as digital natives that devoured a diet of "media" and were enmeshed in technology in their lives outside of the classroom (Linik, 2012; November, 2010; Prensky, 2011; Rosen, 2010). Hence, it was somewhat surprising to the researcher that the students did not possess more new literacy skills than the ones that emerged from the study especially as it related to basic computer skills and the use of wide spread applications such as Microsoft Word. However, students did demonstrate engagement in a variety of new literacy behaviors. The major new literacy skills that were identified relate to the

following themes and were determined through the use of the New Literacy Skills Checklist

(Appendix B) : personalization of profile within an LMS, participation in on-line discussions,

use of language, locating and evaluating on-line information, sharing created files, shared

learning, use of word processing applications, and multimedia. The students participating in this

study reported little to no previous interaction with a LMS, but they were familiar with popular

social networking sites such as Facebook and Instagram. Because students were familiar with

similar sites, they had little initial difficulty using the website to create a personal profile, create

posts and reply to posts. The classroom teacher explained that she had used the same LMS in

previous years, and she also found the site very user friendly because it was so closely related to

Facebook, which she uses on a regular basis.

Furthermore, the classroom teacher explained that students spend a considerable amount

of time at school using computers to access specific web based programs to prepare for state

assessments. These programs typically provided students with a platform to practice a specific

skill through multiple choice questions and games. The teacher clarified that students are rarely,

if ever, given the opportunity to use technology other than to access practice websites or to look

up information related to a research project. The lack of use of ICT's at school may explain why

students did not choose to use various applications and programs to assist them throughout the

study. Additionally, the teacher had to provide various mini lessons about different technology

skills throughout the study to help students better understand the use of different tools, and upon

reflection, the teacher stated that many of these skills would have likely been taught if students

had the opportunity to use the computers in a manner other than on-line testing practice.

Participation in On-line Discussions. During the study, students had several

opportunities to participate in on-line discussions. Students used small, netbook computers in the

classroom to access the Internet and to engage in discussions. Occasionally, students used lab computers to access the LMS and to create or respond to posts. During the first few weeks of the study, two students also used their home computers and Internet access to engage in on-line discussions while out of school. However, most of the students did not have Internet access at home or were not allowed to use home computers and devices, which could have resulted in the limited number of posts that took place outside of school. According to the Corporation for Public Broadcasting (2003), low-income students continue to lag behind other students in home internet access.

According to the teacher, students were given 45 minutes every Tuesday and Thursday to access the LMS, complete the discussions, respond to posts, and complete the associated task or assignment. If students did not have time to finish, they often tried to use the computer lab time to "catch up". Students continually asked the teacher if they could log onto the LMS, which she interpreted as them being engaged and excited about learning through the LMS. The teacher reported that students raised their hands during a math lesson to ask if they could post a discussion; she also stated that students asked her if they would be able to use the LMS in other subject areas. According to Student 3, "I really like being able to log on and read the posts, but I did not always have enough time. I wished we had more time to use it."

Although students were given very few guidelines regarding the quality and quantity of their online posts, the news feed transcripts revealed that the students established their own expectations for acceptable responses. Through agreeing and liking, students recognized insightful responses, but they also questioned, extended and clarified each other's thinking. The threaded discussions offered students a chance to compose and post their own discussions to elicit responses from peers. With little to no adult intervention, students assumed responsibility

for creating a social learning environment that was engaging, supportive, and, at times, thought

provoking. Students learned how to post a new message or reply to an existing message rather

than starting a new thread after a mini lesson from the teacher. Through direct instruction

provided by the classroom teacher, students learned how to reply to specific posts in order to

keep communications about the same topic aligned and how to create new posts in order to share

an idea or ask a question. Even though students were not required to respond to their peers'

posts, many of them chose to do so, which is recognized as students taking some ownership of

their learning and showing leadership within the learning environment. Additionally, the use of

student initiated discussions and responses points to the idea that the learning in this classroom

has surpassed the traditional teacher driven discourse. The principles of a New Literacy

Perspective explain that "teachers become more important, though their role changes, within new

literacy classrooms" (Leu, et. al., 2004, p. 1599). Previous studies have shown that learning has

become more dependent on the students' sharing of ideas and experiences rather than on the sole

reliance of the teacher (Ciardiello, 2004; Forbes, 2004; Jacobs, 2004; Lewis & Fabos, 2005;

Salavuo, 2008).

Overall, the posts served many different purposes. Students clearly used the threaded

discussion board to communicate with their peers and the teacher. However, most of the posts

were general in nature, were limited to a few responses, and did not embrace in-depth

discussions. The teacher generated posts typically asked students to think deeply or to think in

different ways in order to promote critical thinking; however, it does not appear that all students

read and responded to such posts. In most cases, students only responded to a teacher post if it

was in response to their personal posts; since these types of posts are limited, there is no clear

evidence that the case study students engaged in deeper thinking by reading the dialogue

between the teacher and other students. The posts did allow students to glimpse into the learning

of others, and since the teacher did not establish a set of rules of how many posts students were

to respond to, it was the student's responsibility to read the various posts and shared files.

Students often responded to peers' posts even though the responses were often informal. The

liking of posts by students seems to show that students at least supported one another's thinking

and learning; however, it cannot be discerned as to the exact reasoning behind the liking of the

various postings. Although not all of the posts encouraged deeper thinking, the LMS did allow

students the opportunity to share learning among themselves and the teacher in many ways.

According to Student 1,

> I liked that I was able to share my ideas with everyone. I don't always get to share in
>
> class because everyone wants to talk and we don't have time. I also liked that [teacher]
>
> could ask me questions. It was fun to use, and I learned a lot.

According to Berry (2001) and Rosen (2010), students are immersed in social networks in which

they engage in meaningful conversations with friends and peers, and it is vital that we work to

understand how these communications can support learning.

       Use of Language. Analysis of the discussion transcripts reveled that students'

responses were sometimes conversational and interactive. When responding to their peers,

students did seem overly concerned with standard spelling and conventional grammar. Students

were able to add personal voice and expression through their creative use of abbreviations,

punctuation marks and acronyms. Additionally, students were able to associate digital images

with their thoughts through the use of emotional icons or emoticons. Students' responses

reflected through the discussions were often informal and playful. However, the creative use of

language and images enhanced their posts by allowing them to add personal voice and

expression, which is an important component of the new literacy skills. According to researchers, the use of symbols, icons, images, and text help communicate the message in an electronic literacy environment (Grisham & Wolsey, 2006; Leu, et al., 2004; Norton –Meier, 2004). On the other hand, Bromly (2006) cautions that the integration of this type of informal writing into school related assignments will require teachers to rethink standards for writing within the classroom in relationship to ICTs. However, students in this study appeared to have an awareness of using language in different ways when responding to their peers and when responding to the teacher. Students appeared to be much more thoughtful about their language choices and used more formal language and conventional grammar when responding to initial discussion and to the classroom teacher, which implies to the researcher that students are practicing and developing their use of the new literacies in different contexts.

Locating and Evaluating On-line Information. Students were given numerous opportunities to locate and evaluate information. In some instances, students were given specific sites to use in order to help them find information, but in other instances, students were expected to locate information on their own. Although the teacher addressed the use of questionable sites such as Wikipedia, students still used these sites as they were often one of the first sites listed on the results page, which suggests that further instruction in information literacy is needed. In addition, it did not appear that students were familiar with evaluating websites or on-line information. When students were not directed to specific websites, they typically chose the first sites that were returned from a search engine. In such cases, they typically skimmed information to see if was useful, which is a helpful new literacy skill, but it needs to be further developed to help students identify quality information. However, the students struggled with locating information within a large amount of text that was directly related to their question or topic;

students seemed to be disengaged with webpage's with extensive print. Rather than using title headings to help identify information that was needed to answer research questions, students typically read all of the information presented. The students in this study seemed to find information easier when directed to specific websites, which may be helpful when students are first learning to locate information and answer questions related to a specific topic. The use of these sites may appear easier because in many cases the teacher or media specialist has already evaluated the information and design of the page before asking students to use it for research purposes.

As students practice and gain experience in finding information on-line, it is important that teachers begin to release control and allow students to navigate to websites of their choice. However, this study did provide a glimpse into how students use and view websites when they are allowed to self select for information, and it was not evident that students used any type of guidelines for evaluating a website. As a proponent of critical literacy, I have come to understand the ways of teaching and the use of literacy that aims to raise awareness and to support the discourse as to how everyday lives and actions are constructed and constrained through the apparatus of power (Freire, 1985; Street, 1984; Heath, 1983). Educators must equip students with the tools they need in order to critically view and question information found on the Internet as well as in their everyday lives so that they can develop a critical sense of awareness as they construct meaning about who they are, where they have been and where they are going (Freire, 1985; Shor, 1997).

Shared Learning. Throughout the research, students had many opportunities to engage in shared learning through the LMS as well as face to face within the classroom. One important idea that emerged during the analysis of shared learning was that students were

sometimes dependent on the posts of others for their learning. In some instances, students used

the ideas that were posted by others to help them shape their own understandings in order to

make the learning easier to understand, which the researcher interpreted as a means of

scaffolding. Because all of the students were able to share their ideas and thoughts, students had

more opportunities to learn from others. In the physical classroom, not all students are typically

given an opportunity to share, so the use of the LMS allowed all students to share their voice

within the virtual classroom. Although the researcher was not able to identify which students

read which posts, she did notice during the classroom observations that some of them were

reading the discussion postings and then directly creating a discussion before completing the

assignment. Although this type of shared learning may not be viewed as a positive outcome, it is

important to note that students did engage in this type of sharing during the research process.

Many types of positive interactions also took place throughout the study. For instance,

students learned throughout various face to face interactions, which included learning how to

search, save, and insert pictures and graphics into Microsoft Word. In such cases, students were

dependent on their peers who were more knowledgeable about the subject matter to help teach

and guide them throughout the process. When students forgot how to navigate to a specific folder

or drive to save or upload documents, they often asked their peers for assistance. In other cases,

students helped one another if the Internet on the netbooks stopped working; it was interesting

that most students asked peers about technical questions rather than relying on the teacher. As

described by the Digital Youth Project, many of these youth practices point to the idea that

students are relying on experienced peers and other content specific experts for information

rather than simply turning to traditional authority figures such as teachers (Mills, 2010). During

these times, the teacher was often working one on one with students, so it was helpful that

students could rely on one another than being solely dependent on the teacher. Once students had

multiple opportunities to practice different skills and behaviors, they became less dependent on

one another. The teacher also offered various direct instruction mini lessons to help teach

students skills that appeared on an as needed basis, such as showing them how to reply to a post

rather than starting a new thread, offering instruction on how to create a Wordle, and showing

students how to utilize the copy and paste feature of Word. Since most of the work that students

created was shared on the LMS, students often saw the work of others and wanted to learn how

they created it; in such cases, they would ask their peers questions and would sometimes go back

and modify their work to reflect their new learning. According to Kelly, McCain, and Jukes

(2009), "Learning is enhanced by opportunities to share and learn with others. Students need to

develop skills to share knowledge and to learn with others both through experiences with face-to-

face situations and through technology" (p. 2).

Word Processing Applications. Students had very limited knowledge of using

various word processing applications. In most cases, students used the LMS to create their posts

rather than using applications such as Word. When students had to create larger pieces of work

such as their biography, most students chose not use Microsoft Word because their knowledge

was so limited; rather, they used the built in application of the LMS with which they were more

familiar because it was so similar to Facebook. One student in particular was much more

comfortable working in Word, and she often showed other students how to use various

formatting features such as changing the font, color, and size of text. It was somewhat surprising

to the researcher that students did not try to use applications with which they were not familiar.

Prior research describes students that are digital natives and are willing and eager to explore new

technologies with little to no adult intervention (Mills, 2010). However, the researcher saw that

students were much more comfortable with programs that they were familiar with, and students

did not explore new technologies without guidance from their peers or teacher. In conversations

with the students, the researcher learned that students manipulate text in picture applications,

such as PicStitch, but they did not realize that their knowledge of formatting text could so easily

be transferred to new applications, such as Microsoft Word. In addition, many of the students

lacked proficient keyboarding skills, which may be another reason that they did not use word

processing programs.

Multimedia. It was clear throughout the study that students were much more

engaged with web pages that utilized multimedia. Students easily watched video and adjusted the

volume of their netbooks. They were able to easily start videos at different points and often

watched them more than once. Students also utilized various built in features of some web pages

such as the dictionary or glossary as well as the text to speech features found on some pages.

Students enjoyed listening to stories that were animated with movement and sound, such as the

ones found on Tumblebooks. They often listened to more than one story, and if they started a

story and did not like it, they quickly found another one and started reading again. In addition,

students played various games that were related to some of the stories they read. Students also

spent much more time on web pages that had various types of multimedia embedded on sites that

were limited to printed text. Students did not seem to engage with text the same way on pages

that were static and limited to print based text (Linik, 2012; Weinstock, 2010).

Lack of Out of School Usage. The students in this study did not use the LMS

very often outside of school. Students reported that they did not have computers that were

working or that they did not have Internet access. Although the researcher told the students they

could download an application on their tablets for the LMS, none of the students reported doing

so. Only two students posted outside of school during first two weeks. It is not surprising that

students did not post outside of school since the students are economically disadvantaged and

previous usage of web based applications, such as Parent Portal and Study Island, have also had

limited use outside of school. It is not clear if the students would have accessed the site if they

had the equipment and access; however, the students did ask the teacher if they could use the site

at home and seemed excited about the possibility of accessing it outside of school.

How does a digital learning management system facilitate interactions among

students? Rooted in social constructivst theory (Vygotsky, 1978), the digital learning

management system provided a learning environment in which students interacted with each

other as they made sense of and accessed the available information and communication

technologies. The identified principles of a New Literacy Perspective (Leu, et al., 2004) states

that "learning is often socially constructed within the new literacies" and that "social learning

strategies will be central to literacy instruction in the future" (p. 1589). In today's technology

rich classrooms, it is simply unfeasible for one teacher to know all the new literacies and teach

these directly to his or her students. Consequently, socially constructed learning plays an

important role in the exchange of skills and strategies demanded by the new literacies and

increasingly complex technologies (Leu, et al., 2004). No longer assuming the role of the sole

educator, the teacher holds a responsibility to create an educational experience in which students

seek and share knowledge and expertise in a social learning environment. Within the LMS,

students encountered multiple opportunities for social learning on-line and face to face.

Upon analysis of the various types of posts and discussions, the researcher found that

although the use of an LMS did provide students with an opportunity to share and learn from one

another, students did not use their postings to consistently engage in deep, meaningful

conversations. Students did not always read the posts of the peers, and in some instances,

students did not respond to posts directed towards them by the teacher. Because the students

have had little to no use of digital learning through an LMS previously, the students may not

have fully understood how the sharing of posts may have shaped their own thinking. Although

the teacher often posted questions to help deepen their understandings, students sometimes

responded with surface level understandings. This type of learning may be reflective of what is

expected in the classroom, and students may not have experience in thinking in ways that

challenge traditional notions and teaching practices. It is also important to note that this research

focused on fourth grade students who may not have reached a development level that allows

themselves to self monitor their learning and supports reflective learning practices. Rather than

embracing the learning opportunity as a chance to broaden their own perspective through the

voice of others, most of the students viewed the discussions as more of a personal assignment.

However, the students did have glimpses of meaningful and thought provoking discussions, but

these types of conversations need to be modeled for students and expectations should be set high

in order to encourage a collaborative environment that supports rich shared learning

opportunities. Although the students may not have used the discussion board to engage in deep

conversations, they did enjoy using the feature of on-line file sharing that digital learning

offered. In some instances, the students would view an uploaded project or file and ask the

student to share how he or she completed it. Then, the student would go back and modify his or

her work to reflect the new learning that had taken place.

It is important to note that even though the students were using technology to complete

their assignments, discussions, and tasks, much of the shared learning took place in the

classroom among the students and with the classroom teacher. Students relied on their peers to

share knowledge about different applications; typically, students looked to more knowledgeable peers to answer questions and to help direct them when using newly learned skills. Students also helped one another when technical issues arose. For instance, students would often ask one another to help them save a file or find a folder rather than asking the teacher. However, the teacher often provided direct instruction to help students better understand various applications such as Wordle as well as how to use the discussion threads in an organized manner. Hence, it is important that we consider how shared learning takes place in on-line environments and during the face to face interactions in the classroom.

How do economically disadvantaged students access ICTs in informal environments? Students access the Internet for a variety of reasons; however, many of the students in this study accessed the Internet at school more often than at home, and many of these opportunities are related to using websites that assess students' understanding of standards. It is interesting that the many of behaviors that occur infrequently are related to reading on-line or finding information on-line. The only reading or locating information behavior that occurred for a significant amount of time was learning about things of personal interest, which is similar to findings in the qualitative portion of this study in that students posted more about areas of personal interest rather than those related to specific learning standards. The act of reading only is often static and sometimes limited to static text; students in this study showed less engagement in static sites with print.

The more popular behaviors, or the ones that took place at a significant or moderate level, seem to have certain aspects in common. For instance, most of these behaviors tend to include some type of multimedia such as watching videos, downloading music, playing games, or practicing for the CRCT, which typically involves the use of games. In addition, behaviors that

allowed students to connect to others such as chatting or using social networking sites took place at a moderate level. These behaviors are all multi modal and engage the students through a variety of formats.

Limitations

Various limitations exist with the context of this study. The study was limited to a group of economically disadvantaged students in fourth grade. In addition, a major portion of this study was limited to six case study participants. These students had little to no access to the LMS outside of the school. Furthermore, their time within the school to access the LMS and to complete tasks was limited to two forty-five minute periods each week for the duration of six weeks. The digital learning management system was also limited to a specific website that was chosen by the classroom teacher and the researcher, and there are a variety of learning management systems available to educators. This study was also limited to the knowledge level of both the classroom teacher and the researcher. Finally, student responses were often defined by the classroom teacher's construction of discussion questions.

Implications for Classroom Practice

While the findings of this study are confined to the fourth-grade classroom in which they occurred, implications for classroom practices may be extended to other contexts. What follows are various considerations for the development and implementation of a digital learning management system to support new literacy skills that emerged from the data collected and analyzed within this study. Recognizing that all schools have distinct needs and resources, teachers and administrators seeking to integrate technology into their current literacy curricula are encouraged to carefully consider and utilize these recommendations to best support the emergence of new literacies within their unique contexts.

This study has various implications for classroom practice. Although the students did not possess the vast amount of new literacy skills that the researcher had initially anticipated, the study did show that economically disadvantaged students did possess many new literacy skills, which are important to understand for student learning and to inform teaching practices. With this in mind, it is recommended that students be given multiple opportunities to share and create responses through on-line discussions in order to give them time and space to engage in use of the new literacies. Furthermore, students need time and opportunity to develop and reflect on these skills. In this study, students expressed their desire to share and communicate on-line; these types of opportunities may provide valuable insights to the new literacies that students use throughout the learning and sharing process. Many of the students in this study had a limited working knowledge of various applications because their interactions with technology were restricted to the skill and drill type of programs used to help prepare them for state standardized tests, so it is essential that the use of technology extends beyond the assessment based programs that are currently in place in many school and classrooms. Teachers need to ensure that time is built in to allow for exploration of the new literacies, and students need many different opportunities to engage in practicing these skills. It is important for educators to understand the new literacy skills that their students' possess so that they can work to create environments that allow them to explore and expand upon these skills; these skills are not only fundamental for current learning environments, but they will likely prepare students for the ever changing world in which we live.

It is also important for educators to understand that the new literacies are constantly changing and shaping our notions of traditional literacy. Therefore, educators should be purposefully mindful of the ways that students engage in language, text, and technology.

Students need to explore and use different types of language as well as text. Students may use informal language and untraditional grammar when engaging in on-line discourse, but educators need to pay careful attention to how the use of language helps students to communicate their ideas and understandings. Instruction should include a variety of texts in different formats; rather than constantly using technology to assess student learning through skill and drill programs, students need time to explore the vast array of applications and technologies available to them. With this in mind, it is important to ensure that teachers have adequate technical support and professional learning that will aid them in quickly solving technical problems in order to provide quality instruction about various applications and programs. With the unreliability of technology in many schools, teachers need to know that they have skills to overcome technical barriers so that they will work to effectively integrate technology in the classroom; otherwise, they will not likely engage in technology integration. It will be necessary for teachers, media specialists, technology specialists, technicians, and administrators to work collaboratively to solve technology related issues or concerns that arise. Hence, teachers need adequate and continuous professional development. While teachers are not expected to have a strong working knowledge of all of the new literacy skills, they need to a strong foundation to understand how these skills shape our learners and how their teachings practices can reflect that learning in real ways that relate to their lives. Another important aspect of professional development relates to the design of on-line learning environments. Teachers need to understand how their roles change in a digital learning environment from being the sole provider of knowledge to a facilitator who carefully and purposefully creates learning in the context of literacy and technology. Hence, it will be imperative that provisions are made to support teachers through professional development.

Teachers and educators also need to offer economically disadvantaged students more opportunities to engage in the use of technology, which will help to bridge the current inequalities in terms of the digital divide; in some cases, this will require direct instruction from classroom teachers to help equip students with the skills they need to effectively use various types of applications. In addition, students need many different opportunities to locate and evaluate information, but it is important that teachers guide students through the evaluation process and provide guidelines for them to use in the future. Again, teachers may need support and should collaborate with other professionals to provide explicit instruction to students on locating and evaluating information.

Recommendations for Future Research

The arrival of the new literacies and integration of ICTs provide unprecedented opportunities for teachers and students. Yet, it is of upmost importance that educators provide ongoing evidence of technology's positive impact on education. The International Reading Association (2002) recommends continued research that identifies "new skills, strategies, and insights essential for successful literacy performance with different information and communication technologies" (n.p.). The National Technology Leadership Coalition (NTLC) supports the need for "rigorous research that identifies specific learning issues best addressed by specific technologies and that illuminates best practices for teaching with technology" (Knezek, Christensen, Bell, & Bull, 2006, p. 18). It is the researchers' hope that this study encourages further field-based research that effectively integrates research based literacy practices within technology-rich environments. What follows are suggestions for future research, based on the data gathered and analyzed for this study.

First, it is important that the implementation of a digital learning environment, such as an LMS, is reproduced in a variety of settings, which may include a language arts classroom, and with diverse populations. This study took place in a classroom that was comprised of students that all meet the requirements to be considered economically disadvantaged. In order to gain a broader view of how digital learning impacts students and to identify the new literacy skills utilized by students, studies including more diverse participants are needed. By extending the LMS to different settings and populations, will participants' utilization of technology and new literacy skills change?

Giving economically at risk students these opportunities is especially important since they are not often offered these opportunities outside of school. In order to prepare all students for the future, we must be willing to give all students, regardless of race, gender or socioeconomic status, the same opportunities. Currently, there are many inequalities that exist within our schools, and technology is one that stands out as being vital to future success. However, many of these students are not given a chance to explore the new literacy skills and other ICTs in school or at home.

Future research should also focus on the types of professional development that teachers need in order to prepare them not only for teaching in digital environment but also for teaching in ways to support the new literacy skills. As educators, we must work to understand how the new literacy skills impact the lives of our students and the role these skills play in learning. Because a fundamental shift occurs in new literacy classrooms, teachers need support to move from sole provider of information to facilitator. What types of professional development are needed so that teachers can create environments that support digital learning and the use as well as the acquisition of new literacy skills?

Since many classrooms are comprised of students with many different learning needs and several learning levels, it is imperative that future research works to understand how an LMS and other ICTs provide or support assistive technology to help meet the needs of diverse learners. Additionally, it is important to understand how the new literacy skills impact learners with special needs. The use of an LMS may provide cost-effective means for special needs students to receive individualized instruction within the regular classroom; various ICTs may allow these students to communicate and share their learning in ways that were not previously possible. How does technology assist and support special needs students within the context of an LMS?

It is also vital for future researchers to consider how classrooms can implement variations and adaptations of the LMS. To support widespread applicability of digital learning environments, research should inform ways to change and adapt the use of an LMS to suit unique needs and situations. Exploration of multiple learning tasks, available technologies to support the creation and production of learning, the use of and need for new literacy skills, and diverse ways of digital communication may reveal the emergence of additional or alternative literacies. How can the implementation of an LMS best be adapted to suit diverse needs and contexts in order to identify and support the new literacies?

Because technology allows students and teachers to collaborate with one another outside of the classroom as well as with learners from around the world, it is important that future researchers work to understand how global learning impacts learners. Does the shared learning that technology allows help students to develop a better understanding of others points of view, of different cultures, and of different ways of viewing the world around them? How can the implementation of an LMS support socially constructed learning over distances and cultural boundaries?

Closing Thoughts

Because the notion of literacy is changing, educators must be willing to understand these changing views and how they impact learning. Teaching students to read and write will no longer be sufficient enough to enable them to be considered fully literate. The understandings and acquisitions of new literacy skills are quickly becoming fundamental aspects of literacy classrooms. Reading and writing in a digital environment differs greatly from reading and writing paper-based texts only (Leu & Kinzer, 2000; Turbill & Murray, 2006). Labbo and Reinking (1999) explain that there are many ways to view these inevitable changes, but it is not possible to ignore them. Educators need to not only be aware of these transformations but also need to develop a clear understanding of how they impact student learning and future student success. According to the IRA (2009), students deserve a learning environment that offers them a literacy rich curriculum that is not limited to print based text and writing but offers a wide variety of the new literacies and as well as the integrations of ICTs.

Results of this study suggest that the integration of technology support the emergence of new literacies within the context of a digital learning management system. The participating students found the discussions, assignments and tasks motivating, engaging, and enjoyable. Students used various new literacy skills in order to deepen their own understandings of various ideas as well as the ideas of others. Students showed enthusiasm to engage in meaningful conversations in an on-line environment, and many students showed positive motivation to learning new skills that were demonstrated by their peers and teacher. This study helped the researcher to understand that technology within many schools is limited to assessment based practices, and students need opportunities to learn basic computing skills as well as to develop the skills they may already possess.

It is my hope that teachers will continue to seek ways to meaningful engage students with technology as well as with the New Literacies. The findings of this study suggest that economically at risk students need various opportunities to engage in these types of learning environments, and learning should encourage the meaning making process so that students become active participants. Furthermore, it is important that learning experiences allow for socially constructed learning through face-to-face interaction as well as on-line. Not only can students learn skills from one another but they also need opportunities to understand other ways of thinking. It is imperative that educators work together to create a learning culture that prepares students to become independent thinkers and creators of knowledge that encourages a broad awareness of the world around them.

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Appendix A

Access to and usage of technology questionnaire

Listed below are some statements about technology and using the Internet. Please read each

statement carefully and mark the best answer for each statement.

1. My age is

   a. 9 years old   c. 11 years old

   b. 10 years old   d. 12 years old

2. How many computers in your home are connected to the Internet?

   a. 0   c. 2

   b. 1   d. 3

3. Do you access the Internet from home using another device like a mobile phone, iPad,

   iPod touch, or tablet?

   Yes   No

4. If you do not access the Internet from home, where do you normally access it?

   Family member's house   Public Library   Friend's House

   Community Center   I don't use the Internet

5. Where do you use the Internet MOST often

   Home   School

6. How often do you do the following activities OUTSIDE of school:

	Never	Less than once a week	Once a week	A few times a week	Once a day	Several times a day
I use the Internet to **find things on a search engine**						

I use the Internet to **read or write messages**					
I use the Internet to **chat/instant message**					
I use the Internet to **access social networks (Facebook)**					
I use the Internet to **download music**					
I use the Internet to **watch videos**					
I use the Internet to **read about sports**					
I use the Internet to **read about actors or musicians**					
I use the Internet to **find pictures or clip art**					
I use the Internet to **learn about things that interest me**					
I use the Internet to **read about school related assignments (i.e. complete work, do research)**					
I use the Internet to **buy things**					
I use the Internet to **play games**					
I use the Internet to **practice for the CRCT**					

Appendix B

Characteristics of New Literacy Classrooms as Defined by Kist

1. Practices include student use of computers during class time.

   - Netbooks

   - Tablets

2. Students draw or utilize some other form of communication when thinking through a

   problem or getting ready to write.

   - Picture

   - Notes

   - Graphic Organizer

   - Talk Aloud

3. Students identify the different forms of expression available for them to utilize.

   - Graphic

   - Emoticons

   - Font Color

   - Font Size

   - Font

   - Audio

   - Music

4. The teacher demonstrates the uses of different media when working through problem(s)

   in the presence of students.

   - Posts

   - Word

- Web 2.0 Tool (specify)

5. Students are permitted to utilize more than one medium when working on projects.

    - Word

    - Audio

    - Application

    - Paper/Pencil

    - Text

    - Multimedia

6. Projects require collaboration with other students.

    - Assistance F2F

    - Posts

    - Teacher question

7. There is evidence that the students are so engaged that they lose track of time.

    - Comments about moving to next lesson

    - Comments about using ICTs or LMS

Other:

    - Google or Bing

        o Text

        o Image

    - Clicking on various sites

    - Games

    - Video

Appendix C

Example of Digital Artifacts

Reading: Section 1

Assignments

Spring 2013

All About You!
Ungraded

Fluent Readers
Ungraded

Spring

Career
Ungraded

E-Books
Ungraded

Evaluation
Ungraded

Fables
Ungraded

Appendix D

Internal Review Board (IRB) Approval

Georgia Southern University		
Office of Research Services & Sponsored Programs		
Institutional Review Board (IRB)		
Phone: 912-478-0843		Veazey Hall 2021
		P.O. Box 8005
Fax: 912-478-0719	IRB@GeorgiaSouthern.edu	Statesboro, GA 30460

To: Sarah Mayberry
            Dr. Judith Repman

CC: Charles E. Patterson
            Vice President for Research and Dean of the Graduate College

From: Office of Research Services and Sponsored Programs
            Administrative Support Office for Research Oversight Committees
            (IACUC/IBC/IRB)

Initial Approval Date: 11/15/12

Expiration Date: 11/30/13

Subject: Status of Application for Approval to Utilize Human Subjects in Research

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After a review of your proposed research project numbered **H13074** and titled **"A Mixed Methods Case Study Exploring the Outcomes of Implementing a Digital Learning Management System in a Fourth Grade Language Arts Classroom,"** it appears that (1) the research subjects are at minimal risk, (2) appropriate safeguards are planned, and (3) the research activities involve only procedures which are allowable. You are authorized to enroll up to a maximum of __75__ subjects.

Therefore, as authorized in the Federal Policy for the Protection of Human Subjects, I am pleased to notify you that the Institutional Review Board has approved your proposed research.

If at the end of this approval period there have been no changes to the research protocol; you may request an extension of the approval period. Total project approval on this application may not exceed 36 months. If additional time is required, a new application may be submitted for continuing work. In the interim, please provide the IRB with any information concerning any significant adverse event, **whether or not it is believed to be related to the study**, within five working days of the event. In addition, if a change or modification of the approved methodology becomes necessary, you must notify the IRB Coordinator **prior** to initiating any such changes or modifications. At that time, an amended application for IRB approval may be submitted. Upon completion of your data collection, you are required to complete a *Research Study Termination* form to notify the IRB Coordinator, so your file may be closed.

Sincerely,

Eleanor Haupes

Appendix E

Parent Letter/Letter of Informed Consent

COLLEGE OF EDUCATION

DEPARTMENT OF LEADERSHIP, TECHNOLOGY, AND HUMAN DEVELOPMENT

PARENTAL INFORMED CONSENT

Dear Parent or Guardian:

A study will be conducted at your child's school in the next few weeks. Its purpose is to explore light on how a teacher can effectively integrate new technologies that develop the skills and behaviors to support the new literacies in a low socio-economic classroom and to better understand the opportunities for access to technology among these students.

If you give permission, your child will have the opportunity to participate in six on-line discussion postings during the regular school day. They will have about 30 – 45 minutes to respond to a writing topic about what they are learning in the classroom. They will be able to share their learning with other students in the classroom through the on-line discussion board. The discussion board is private in that the public does not have access to it; only your child, other children in the classroom, the teacher, and me have access to the discussion board. You can request access through me if you would like to better understand and keep track of what your child is doing. I will observe various students in your child's classroom while they use computers to create their response. Also, your child will be asked to answer some questions on a questionnaire about how and why they use the Internet when they are not in school.

Your child's participation in this study is completely voluntary. The risks from participating in this study are no more than would be encountered in everyday life; however, your child will be told that he or she may stop participating at any time without any penalty. Your child may choose to not answer any question(s) he/she does not wish to for any reason. Your child may refuse to participate even if you agree to her/his participation.

In order to protect the confidentiality of the child, a number and not the child's name will appear on all of the information recorded during the experiment. In some instances, a pretend name will be given to all students so that no students will be identified during the reporting of the data. Your child will not be expected to put their name on the questionnaire about how and why they use the Internet when they are not at school. All information pertaining to the study will be kept in a locked filing cabinet in an office at your child's school.

If you have any questions or concerns regarding this study at any time, please feel free to contact Sarah Mayberry, Georgia Southern University College of Education doctoral student, at 478-779-2406, or Dr. Judi Repman, advisor, at 912-478-5394.

To contact the Office of Research Services and Sponsored Programs for answers to questions about the rights of research participants please email IRB@georgiasouthern.edu or call (912) 478-0843.

If you are giving permission for your child to participate in the experiment, please sign the form below and return it to your child's teacher as soon as possible. Thank you very much for your time.

Sarah Mayberry   Dr. Judi Repman

College of Education student   Department of Leadership, Technology, and Human Development; COE Professor of Instructional Technology

Investigator's Signature_____

Child's Name: _____

Parent or Guardian's Signature: _____

Date: _____

APPENDIX F

County Office of Teaching and Learning Approval

October 5, 2012

Ms. Sarah Mayberry
680 Herring Drive
Macon, GA 31204

Dear Ms. Mayberry:

The Research Committee met to review all submissions to conduct research In the County School District.   They **"have approved"** your request to conduct research study entitled, "*A Mixed Methods Case Study Exploring the Outcomes of Implementing a Digital Learning Management System in a Fourth Grade Language Arts Classroom*."

You did say that the purpose of the research is "To explore how a teacher can effectively integrate ICT's that develop the skills and behaviors to support the new literacies in a minority classroom and to better understand the opportunities for access to technology among these students." Remember, school personnel may decide at any time that they do not wish to participate. This is an independent decision on behalf of staff.

Congratulations at the successful completion of all of your wonderful works!

Sincerely,
Edward Judie, Jr.

Edward Judie, Jr.
Deputy Superintendent—Student Affairs

EJJ:pm