CLASSROOM TEACHERS LEARNING TO NAVIGATE THE INTERNET FOR INCREASING STUDENT CRITICAL READING AND WRITING SKILLS: A MIXED METHODS STUDY

by

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DEDICATION

I dedicate this work to my grandchildren, my next generation of readers and writers:

Benjamin Dean
Elizabeth Kaitlyn
Ethan Alexander
Julia Ann
Stephanie Kristen

I give special thanks to my two daughters, Sarah and Anna, who have encouraged me and have taught me how to keep on learning. Thank-you, Mom; you have been my constant cheerleader. Also to my son Drew: thanks for all the late-night conversations, your writing advice, and your online gaming help. You taught my dragon how to fly!

This work is also lovingly dedicated to one of the best teachers on the planet, my husband Kerry. Thank you for your patience, your prayers, and your confidence in me.

Remember, I've only been able to do things through Christ who continually strengthens me, and He will do the same for each of you.

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ABSTRACT

The focus of this mixed methods case study was a three-month professional development workshop designed to guide junior high school classroom teachers as they learned to integrate new literacies skills into their curriculum. The participants were all educators in one district which was in the process of transitioning to the Common Core State Standards and the SMARTER Balanced Assessments. Significant gains were obtained in teachers' self-reported personal technology knowledge and technology experiences during the study. Along with the gains, factors were seen that might impede teachers from learning about or using the Internet for academic purposes.

Keywords: new literacies, online student collaboration, mixed methods, case studies, professional development

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CHAPTER ONE: INTRODUCTION AND OVERVIEW OF STUDY

The multifaceted, ever-changing nature of the Internet has been called many things during the past decade in an attempt to understand its nature within global cultures, its effects on American society, and the role it should play in reshaping twenty-first century educational systems. The nomenclatures to explain it are as plentiful as the arguments for and against educators embracing it: The Read/Write Web (Lawson, 2005; Richardson, 2010), Web 2.0 (O'Reilly, 2005), Information and Communication Technologies (Sharpe, Beetham, & deFreitas, 2010; UNESCO, n.d.), technologically mediated communication tools (Wheeler & Wheeler, 2009), collective intelligence applications (O'Reilly & Battelle, 2009), web-enabled authoring systems (Lenhart & Madden, 2007), or socially-constructed web applications (Tysseling & McCulley, 2012).

O'Reilly (2005) first described the term Web 2.0 technologies as a way to detach from the old thinking about Web 1.0 technologies, which were compilations of static pages written in hypertext markup language (HTML). As O'Reilly and Battelle (2009) explain, applications utilizing the Web 2.0 platform are all about "harnessing collective intelligence … co-created by and for [a] community of connected users" (p. 2). In other words, the value of Web 2.0 technologies—and thus the dramatic changes—have to do with the synergizing power of creating information within vast, global communities of online users. Learning is no longer an isolated process. The flood of information and ideas caused by these current social networking and interactive publication practices,

without traditional boundaries of time, space, or linearity, have sparked new ways of communicating and learning from one another (Richardson, 2010). Any person with an Internet connection can become part of a conversation, community, or work group, irrespective of education, age, financial and political power, or professional skills. The differences between Web 1.0 and Web 2.0 technologies are contrasted in Figure 2.1. In the first chapter of their New Literacies research handbook, Coiro, Knobel, Lankshear, and Leu (2008) state that "literacy is no longer a static construct" from the standpoint of its defining 500-year-old technology of traditional "offline" print; "as the Internet becomes an increasingly important dimension to life in the 21st century," and text shifts from page to screen, literacy educators and researchers must respond to these dramatic changes (Chpt. 1, 2nd section).

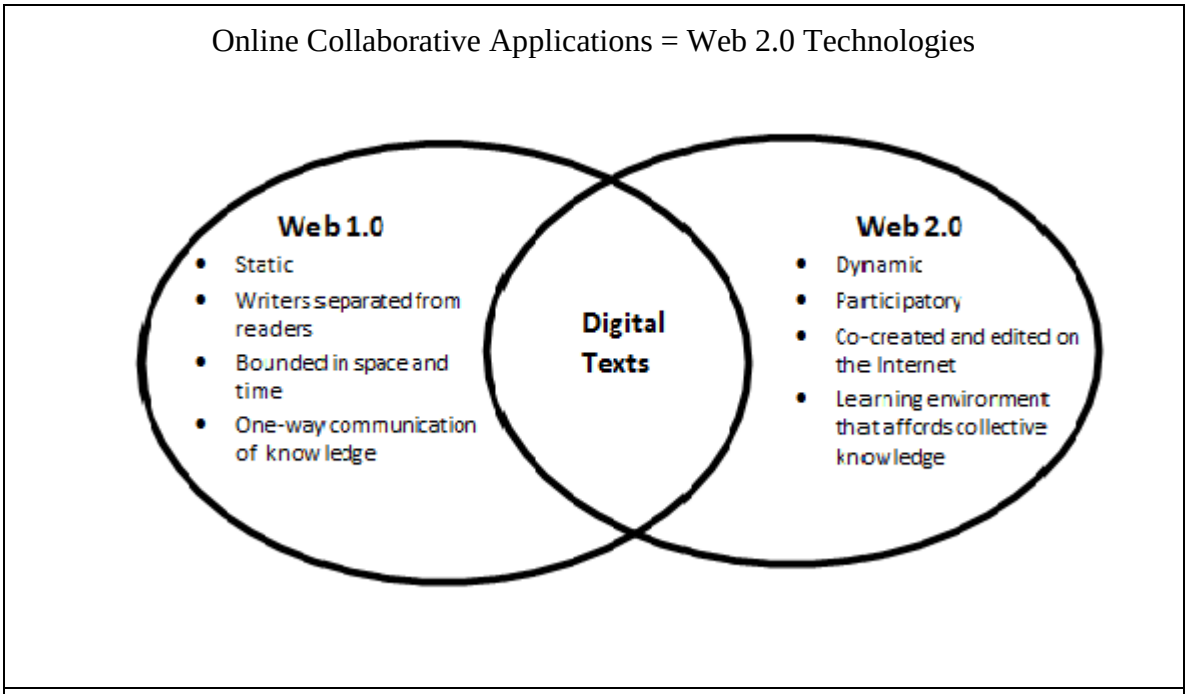


Figure 2.1. **Comparison of Web 1.0 versus Web 2.0**

Online collaborative applications appear as promising new educational tools that are readily adaptable to the public school classroom. More and more people are accessing information on the Web from their homes, work, and mobile devices, and the nature of hypertext at hyper-speed is shifting the way people communicate, learn, and collectively generate new ideas. Online collaborative applications provide an open, digital space that is readily edited by teams of learners who desire to discuss, accommodate, and assimilate new understandings. With the Internet's capability of instant communication, which is now enhanced by a multitude of free online applications and inexpensive tools, communities of like-interested learners from around the world have joined in new collaborative efforts to understand ideas, solve problems, and form new understandings without the boundaries of time and distance. Yet, as schools across the nation attempt to transition to Web 2.0 technologies, along with new standards and assessment which embrace twenty-first century skills, there appear to be complications.

New Literacies Research

As the global community continues to embrace opportunities afforded by Web 2.0 technologies, the characteristics of multiple, multidimensional, multifaceted texts have created new complexities both for literacy researchers when redefining reading comprehension and for classroom teachers when redesigning their instructional strategies to teach reading comprehension. Web 2.0 technologies are changing the way people must critically read, write, and think as they learn new information. This specifically applies to the K-12 students of the twenty-first century (Partnership for 21st Century Skills [P21], 2012).

The nature of Web 2.0 technologies has expanded the definition of the term *literacy* over the past two decades (Leu & Kinzer, 2000; Reinking, McKenna, Labbo, & Kieffer, 1998), shifting the definition to encompass the way that readers must interact with these new forms of texts in order to comprehend and learn in a meaningful way (Coiro, 2003). This has also shifted the way that effective teachers of reading must teach young readers (International Reading Association [IRA], 2001; National Council of the Teachers of English [NCTE], 2008; Pianfetti, 2001; Reinking, et. al., 1998).

New Literacies researchers have defined "new skills, strategies, dispositions, and social practices" that are required by new technologies for information and communication (Leu, O'Byrne, Zawilinski, McVerry, & Everett-Cacopardo, 2009, p. 265). Literacy and educational proponents (IRA, 2009; NCTE, 2008; P21, 2012) support the instruction of these various literacy skills—strategies and dispositions for online reading, writing, and communication—which students require if they are to be "fully prepared to participate in the global community of the twenty-first century" (Leu, O'Byrne, et al., 2009, p. 265).

The term *online collaborative applications*, interchangeable with Web 2.0 technologies or any other of the ICT terms, will be used throughout this dissertation to describe the Internet-based tools, applications, or platforms that afford K-12 teachers the ability to teach New Literacies to their young writers, readers, and communicators. The Internet, also known as the World Wide Web (WWW) or the Web, is the vehicle used by all these applications to both acquire and share information. The phrase "being online," whether by means of an actual Ethernet cable or by a wireless connection (or "Wi-Fi"

connection) indicates that the user's computer or mobile device is connected to this vast, global networking pipeline.

Online collaborative applications provide an open, digital space that is readily edited by teams of learners who desire to discuss, accommodate, and assimilate new understandings. With the Internet's capability of instant communication, which is now enhanced by a multitude of free online applications and inexpensive tools, communities of like-interested learners from around the world have joined in new collaborative efforts to understand ideas, solve problems, and form new understandings without the boundaries of time and distance. The term online collaborative application implies the ability to create, edit, and store hypertext on the Web so that it can be accessed by multiple users from a variety of devices connected to the Internet.

Twenty-First Century Skills: Catalysts for Change

There are catalysts for change within the American public education system, poised to place new demands upon educational communities at all levels. One catalyst, the nation-wide adoption of the Common Core State Standards, promotes "career and college readiness" for students of the twenty-first century (National Governors Association Center for Best Practices & Council of Chief State School Officers [NGAC & CCSSO], 2010). Educators at all levels—federal, state, district, and local—are currently preparing to accommodate these standards that mandate radical changes, especially in the area of critical reading, writing, and communication skills to accommodate twenty-first century skills. The new standards and corresponding assessments, expected to be fully implemented by the 2014 - 2015 school year, are placing both literacy and technology in the spotlight due to the changes in K-12

curriculum and instruction that incorporate twenty-first century skills. As a result of the new standards and assessments, the expectations for literacy and technology instruction are in the process of transitioning to include all content area classrooms. Content area teachers are being encouraged to integrate technology as they attempt to align old pedagogical practices with the new.

The Partnership for 21st Century Skills (P21, 2012), an eclectic coalition represented by educators, educational companies, businesses, community members, and government leaders, provided principles and recommendations for the United States government during the process of reauthorizing the Elementary and Secondary Education Act (ESEA). Members of Partnership for 21st Century Skills, often shortened to P21.org, helped to generate the language seen throughout the Common Core Standards. According to their mission statement, P21 serves "as a catalyst to position 21st century readiness at the center of U.S. K-12 education" (P21, 2012, 1st para.). In their white paper which outlined their principles and recommendations (Partnership for 21st Century Skills (P21), 2010), they promoted the integration of higher-order thinking skills and core subjects in order to "make learning more rigorous, relevant and engaging" (p. 2). "…Both core subject knowledge and skills are necessary for readiness in college, work and life. Preparing all students with content knowledge and essential skills will empower them to meet new global demands" (p. 2).

Inherent in their recommendations is the admonition to stop using standards to measure school deficiencies; instead, they encourage educational leaders to seek ways to raise the standards and then use them as a target to be attained. They explain their reason for this shift:

> But we haven't committed to adjusting education policy to make K–12 education relevant in a flat world. National education policy has been looking in the rear-view mirror to determine if all schools and students are performing up to last century's standards. This has been useful—because we know that many of them have far to go to reach these standards. But this emphasis is not enough. We need to commit to a more important goal than rooting out underperformance. We also need to determine whether every child is ready to contribute in a competitive, interconnected world. We need to commit to 21st century readiness for every student. The bottom line: We can't expect to remain globally competitive if our students aren't. (P21, 2010, p. 3)

As outlined in their position statement and recommendations, P21 (2010) has described the other main catalyst for change within the educational system. This catalyst is the dramatic advancement in technology use related to the Internet. As stated above, the new standards must guide educators at all levels to determine "whether every child is ready to contribute in a competitive, *interconnected* world" (p. 3). Bringing this concept of co-created, collective intelligence (O'Reilly & Battelle, 2009) into the structure of traditional American public school settings, however, seems to be another matter.

Bringing researched theories into practice has always been a challenging part of the educational process (Brown, 1992; Greene, Caracelli, & Graham, 1989; Stewart & Brendefur, 2005). However, the combination of the new standards, assessments, and the new technologies, along with other barriers that have prevented smooth transitions from the old to the new within well-established educational communities (Dillon, O'Brien, Sato, & Kelly, 2011; DuFour, 2007), are all creating additional strain within the system.

Purpose and Context of This Study

The purpose of this study was to examine the effects of introducing and using interactive, collaborative online applications as a means of increasing practicing teachers' technology knowledge and skills and as a way of shifting pedagogical thinking and classroom practices to accommodate effective student use of the Internet within content areas. As part of a formative experiment model, I focused the research on a pedagogical goal: teachers would use online collaborative applications as a means of increasing student critical reading and writing skills. I created and instructed a three-month professional development course for the teacher participants, utilizing a wiki application as a model online collaborative learning environment.

The teachers who participated in this study were already seeking ways to improve student critical reading and writing skills in preparation for the new multi-statewide assessments being created for the Common Core Standards. The teacher participants—volunteers who chose to take the digital literacies course for workshop credit—all worked in schools within one district which used an embedded professional learning communities (PLC) framework (DuFour, Eaker, & DuFour, 2005). The host school's PLC goal, of improving student critical reading and writing, provided an important connection between technology and literacy for the teachers.

Participants in the study were all junior high teachers, teaching social studies, English language arts, and reading in a variety of general education and special education settings for students in the seventh through ninth grades. As part of a three-month professional development course, often described as a professional development workshop throughout this dissertation, teacher participants practiced online collaboration

in a private wiki website, explored various online applications, and collaborated together building digital projects for use in their classrooms.

In the role of a digital literacy instructor and embedded researcher, I introduced the participating teachers to theories suggested in New Literacies research (Coiro, 2003; Karasavvidis, 2010; Lankshear & Nobel, 2011; Leu & Kinzer, 2000; Sharpe, Beetham, & deFreitas, 2010), guiding them as they created their own structured, collaborative learning spaces for their students as a way to increase critical reading and writing skills.

Statement of the Problem

The multifaceted complexity of learning to navigate the world of the Internet while simultaneously attempting to integrate new pedagogical strategies within the existing constraints of current content area curricula has created challenging demands on classroom teachers. Several factors seem to exacerbate these challenges. One factor is the open nature of the Internet, which is described as a gateway to unlimited educational opportunities by technology advocates (Richardson 2010) and a possible detriment by others (Ferriter & Garry, 2010). Many of the advantages gained when using an Internet connection are also perceived as reasons for concern, especially for public school educators who are expected to provide safe, positive, and effective learning environments for all of their students. The unbounded structure of Web 2.0 applications, which allows students an immediate way to communicate with others, is seen as a disadvantage by teachers who are attempting to set boundaries for a positive, rigorous, safe academic environment (Lemke, 2010; Wallace, 2004).

Transitioning the Curriculum

The dramatic curriculum changes inherent in the transition to the Core Standards are another compounding factor. As practicing teachers contend with shifting their curriculum—adding more reading of rigorous, higher-level texts and more writing in the content areas (NGAC & CCSSO, 2010)—the addition of learning how to incorporate new technologies for academic purposes into their existing workload may seem a daunting and, at times, an impossible expectation on their professional time. The methods with which their students will be assessed at a state-wide level are also undergoing dramatic change (SMARTER Balanced Assessment Consortium (SBAC), 2012), which teachers also perceive as additional demands on their instructional practices and preparation time.

Teachers see the use of technology as an "add-on" to what they must learn rather than a way to make the learning easier for them and their students (Kay, 2010; Lemke, 2010). What appear as positive new tools to increase teacher efficiency, to engage students in their learning, and to communicate to parents and other educators within the system may be creating confusion and resistance underneath the surface.

Online reading, writing, and communication skills are currently being added to university education programs (e.g.., Lee & Young, 2011; Karasavvidis, 2010; Tysseling & McCulley, 2012), but were not taught during the college days of most practicing teachers. The literacy strategies that teachers learned in college—how to read and teach static text —still apply when teaching reading and writing in the classroom. However, new literacy skills are needed to read and teach the hypertext of the Internet. The impact that digital spaces have created on the reader's ability to make meaning has shifted

rapidly in the past few years, and teachers can no longer underestimate the "magnitude of these shifts" (Tierney, 2009, p. 261). However, online reading, writing, and communication skills needed to learn and apply information for academic purposes do not always come intuitively. In order for students to learn digital literacy skills, they need to be taught (Sharpe, et al., 2010; Tierney, 2009). Neither teachers nor students have been given opportunities to explore the newer collaborative technologies within traditional public school settings for academic purposes.

The Pace of Research Practices

Another piece of the problem must be considered. The well-documented gap between conventional literacy research methodologies and instructional practice (Brown, 1992; Jacob, 1992) is exacerbated by the unprecedented pace of technology developments (Bradley & Reinking, 2011b; Coiro, Knobel, Lankshear, & Leu, 2008). In 2000, the National Reading Panel promoted experimental methods as the gold standard for implementing scientifically based reading instruction (National Reading Panel, 2000). This rigid, time-consuming process conducted in controlled environments does well when defining best practices for student achievement, but "it does not inherently provide guidance about what factors might be relevant to successful implementation" in specific learning environments (Bradley & Reinking, 2011b, p. 189), especially if those learning environments are being bombarded with fast-paced changes. The fast pace of current technological advancements, along with the urgent need for implementing the new Core Standards, are outpacing the requirements for conventional experimental methods.

Significance of Study

This study is the third iterative cycle of New Literacies research intended to take theory into practice. The first iteration (Tysseling & McCulley, 2012) explored possible guidelines for increasing rich, collaborative online conversations for academic learning among preservice and in-service teachers when using instructor-created wiki websites for literacy courses. The second iteration was conducted as a pilot study (McCulley, 2012) as I transitioned my research to the K-12 public school environment. During the pilot study, I used the proposed guidelines created for online student collaboration from the first research project as I coached two practicing teachers in contrasting junior high school classrooms. This second iteration led to my refinement of possible guidelines for creating a safe and productive online environment for K-12 students. It also helped me define a set of factors that appear to inhibit or enhance the use of online collaborative applications in traditional secondary educational settings.

This third iteration of research added an important next step as I transitioned from my role as a one-on-one instructional coach to the role of a professional development instructor. As suggested by Herrington and colleagues (2007), "once a learning environment or intervention has been designed and developed, the next phase of design-based research encompasses the implementation and evaluation of the proposed solution in practice" (p. 4094). I designed this current study to collect data and evaluate my role as a professional development instructor when introducing New Literacies theory to practicing K-12 teachers. The intervention—a three-month professional development course for university credit—provided the mechanism for this phase of research.

As will be discussed further in Chapter Two, very little research in the area of educational technology as it affects student literacy skills has been conducted in a naturalistic setting at the K- 12 grade levels, which adds to the significance of this study. Also of importance, this study probed the factors that may be inhibiting or enhancing the use of online collaborative applications in junior high classrooms. I also tested guidelines that had been developed during the previous iterations. These guidelines may provide assistance to educators as they connect their existing curricula with the new standards for career, college, and citizenship readiness. By learning how to create, integrate, and successfully implement online applications for their students, practicing teachers may be influenced and perhaps motivated to shift their pedagogical thinking towards twenty-first century skills.

Overview of Research Methodology

This research was initially framed within a formative experiment model as outlined by other digital literacy researchers (e.g., Bradley & Reinking, 2011b; Ivey & Broaddus, 2007; Reinking & Watkins, 2000). The pedagogical goal of the formative experiment focused upon the teachers incorporating online collaborative applications within their content instruction in order to increase student critical reading and writing skills.

A mixed methods design was chosen, described as a convergent parallel design (Creswell & Plano Clark, 2011), which provided strength to the research data collection and analysis process. In this design, both quantitative and qualitative data are collected simultaneously during cycles—before, during, and after the completion of the intervention being studied. I collected data from a variety of sources to enhance my

ability to view multiple perspectives over time. Immediately after collecting the first data, I started data analysis by using traditional quantitative procedures to measure quantitative data, and, at the same time, I started traditional qualitative coding procedures as I searched for themes emerging from the data. For quantitative analysis, I used descriptive data analysis after the first two cycles of data collection, and then I conducted a statistical analysis with paired samples (within-subjects) t-tests to measure the significance of participant gains. I generated the quantitative results with IBM Statistical Product and Service Solutions (SPSS) computer software. For qualitative coding, I utilized the constant comparative method. This method was first described by Glaser and Strauss (1967) as a means for developing grounded theory. This strategy is compatible with the "inductive, concept-building orientation of all qualitative research," (Merriam, 1998, p. 159), and aligned well with my mixed methods design and the intent of my study.

When data analysis was completed, I merged and consolidated the findings. I constructed various data matrices—a type of data display described by Creswell and Plano Clark (2011)—which allowed me to combine, or converge, the individual findings from the qualitative and quantitative data analyses. After the final data consolidation process, as I started to share the results of my research with professional colleagues, difficulties arose when clarifying the research within the formative experiment model. By realigning the original formative experiment model and the mixed methods design to that of a case study model (Merriam, 1998), I was able to clarify the results emerging from the data.

Essential Guiding Questions

The first four essential questions for this project were modeled after those of other formative experiments conducted by literacy researchers (Ivey & Broaddus, 2007; Reinking & Watkins, 2000). The fifth question to the study was added as part of the case study framework.

(1) If teachers construct and implement units of study within their content area that use socially-constructed applications, will teachers be able to document positive student critical reading and writing growth in their classrooms?

(2) What factors will enhance or inhibit the effective use of these online applications?

(3) Will individual teacher participants perceive a significant growth in their technology knowledge or skills?

(4) Are there changes in teachers' pedagogical practice in regards to using technology with students in the future? If so, what type of changes?

(5) How do practicing teachers learn new online applications? What motivates teachers to learn new technologies?

Definitions of Key Terms

Asynchronous applications. Asynchronous is an adjective meaning "not at the same time." This is a feature of many online applications: only one editor is allowed to work on a webpage at a time. Wikis are asynchronous applications. Google Drive applications are not, as more than one editor can view and make changes at the same time.

App: App is short for software application. Apps are applications for smartphones, tablets, or mobile devices. Apps are small pieces of software designed for one specific purpose such as a calculator, maps, interactive book, etc. Generally, apps are less complicated and easier to use than the feature-heavy applications run on computers (Spector, 2012).

Blog: Blog is a combination of the words "web" and "log". Blogging is an easy way to start the equivalent of a class website. Teachers and students can post articles and open the blog up to comments from students, teachers, or anyone around the world. Unlike a website, blogs do not require web programming skills (Richardson, 2010). Two examples of popular blogging sites are WordPress and Blogger. The KidBlog site has privacy features for younger students.

Case Study: A type of research design originally described by qualitative researchers (e.g., Merriam, 1998). It is a "detailed examination of one setting, or a single subject, a single depository of documents, or a particular event" (Bogdan & Biklen, 2007, p. 270)

Common Core State Standards (CCSS): These are the new standards currently being adopted by a majority of states across the country. The CCSS Initiatives handbook was written by two national entities: the National Governors Association Center for Best Practices and the Council of Chief State School Officers [NGAC & CCSSO] in 2010. The CCSS standards and corresponding assessments are intended to replace the existing state standards and assessments created under the No Child Left Behind (NCLB) Act of 2001 (NGAC & CCSSO, 2010).

Critical Reading and Writing Skills: Term currently being promoted within the Advancement via Individual Determination (AVID) college readiness program (LeMaster, 2010). Example instructional strategies from AVID include the use of Cornell Notes, marking up texts during multiple readings, and utilizing 2-column note-taking strategies.

Deixis of New Literacies: Deixis (dike-səs) is a defining quality of New Literacies (Leu, 1997; Leu & Kinzer, 2000). The deictic nature of literacy related to ICTs alludes to the rapidity of changes and how readers and writers adapt to those changes: "Today, technological change happens so rapidly that the changes to literacy are limited not by technology but rather by our ability to adapt and acquire the new literacies that emerge" (Leu, Kinzer, Coiro, & Cammack, 2004, p. 1569.).

Design-Based Research: A specific research framework that promotes iterative cycles to test innovations or instructional interventions. It is sometimes called *design research*, a "generic, more encompassing term," that emphasizes a "broader range of education research that all share a core of defining attributes" ((Bradley & Reinking, 2011b, p. 192). This framework focuses and clarifies researching efforts that "foster learning, create useable knowledge, and advance theories of learning and teaching in complex settings" (Design-Based Research Collective, 2003, p. 5).

Digital literacy: The ability to use digital technology, communication tools, or networks to locate, evaluate, use, and create information.

Formative experiment: A more specific name for a research model that fits under the category of design-based research. It is commonly used by digital literacy researchers because the model allows for objective research when working in a natural

environment. The researcher develops essential questions based upon the focus of a pedagogical goal. The formative experiment model "accommodates both the variation inherent in classrooms and the need to adapt interventions in response to relevant variation" (Bradley & Reinking, 2011a, p. 193).

Google Drive: A suite of online applications which prove collaborative construction of documents, spreadsheets, survey forms, and presentations. Google Hangout now provides a platform where multiple users can collaboratively discuss and edit documents created in any of these applications. Editing can be conducted asynchronously or at the same time in an online forum which provides live audio or video and instant messaging sidebar conversations while teams view and edit their work.

ICT: An acronym for Information and Communication Technologies. The global term, originally coined in the 1980s, refers to all technologies that allow people to send and receive information with others all over the world. This includes radio, television, video, DVD, telephone, satellite systems, hand-held mobile devices, computer and network hardware and software. For educational purposes, the term describes anything to do with the computers, electronic devices, or other applications on the Internet that bring digital information to the classroom. (UNESCO, n.d.).

Mixed Methods Case Study: A type of hybrid research design "where researchers embed both quantitative and qualitative data within traditional designs or procedures" (Creswell & Plano Clark, 2012, p. 95). It is also described as an embedded design variant where "…one or both methods are embedded in combination within a larger design or procedure" (p. 95).

Moodle: Moodle is an acronym for Modular Object-Oriented Dynamic Learning Environment. It is an Open Source Course Management System (CMS). A CMS is also known as a Learning Management System (LMS) or a Virtual Learning Environment (VLE). Although free, it does require installment on a specific web server. For teachers, it is generally downloaded and accessed through a district-wide server. "It has become very popular among educators around the world as a tool for creating online dynamic web sites for their students" (Moodle.org, n.d., *About Us* page).

New Literacies: (uppercase term) A broader term for research in the area of new literacies skills. New Literacies researchers have adopted an open-source approach to theory development, encouraging everyone who studies the literacies of the Internet to contribute to the global theory (Leu, O'Byrne, et al., 2009)

new literacies: (lowercase term) A term that incorporates the skills needed to read, write, and communicate with nonlinear hypertexts (digital texts embedded with sounds, videos, images, and symbols linked to other digital texts) into the traditional definition of reading and writing (IRA, 2001; Leu, Kinzer, et al., 2004). The research with new literacies skills is informing the global New Literacies theory.

Platform: In simple terms, a computing platform is needed to launch computer software or applications. A platform includes a combination of hardware architecture and an application framework that allows a program to speak to the operating system, programming languages, and related user interfaces such as run-time libraries or graphical user interfaces. Web 2.0 simplified this technology.

SMARTER Balanced (SBAC): One of the two national assessments that align with the Common Core State Standards. SBAC is overseen by Smarter Balanced, a state-

led consortium with a “transparent, consensus-based governance structure” (SBAC, 2012, *About Us* page, para. 1). The state of Idaho plans to implement the SBAC assessments during the 2014 -2015, replacing the Idaho State Achievement Tests (ISATS) which were developed under NCLB Act of 2001. There are currently two separate consortiums developing these CCSS assessments: SMARTER Balanced Consortium (SBAC) and the Partnership for Assessment of Readiness of College and Careers (PARCC). Idaho is a governing state within the SBAC assessment consortium.

Social Networking: The main features of social networking sites afford users the ability to form online communities. These communities may be formed for personal reasons, for promoting businesses and organizations, or for professional learning opportunities. MySpace, FaceBook and LinkedIn are examples.

Web 2.0 applications: (also referred to as **online collaborative applications** for this study) Web 2.0 applications do not require downloading, installing, or any software on a computer hard drive in order to run. “This is great for teachers as you do not need to get special permission from your IT department to install web applications on your school’s computers. Web applications are also “platform independent” which means they will work on all types of computers, whether you have a Mac, Windows, or Linux PC” (Spector, 2012, *Definitions* page). Examples include Google Maps, Flikr, Delicious, or Google Sites.

Wiki: A page or collection of webpages designed to enable anyone who access it to contribute or modify content, using a simplified markup language (Richardson, 2010). *Wiki* is the generic term for this open-source, asynchronous application first designed and created by Ward Cunningham in 1995. There are hundreds of different companies who

have implemented wiki applications: Google Sites, Wikimedia, PBWiki, WetPaint, to name a few. Many learning management systems contain wiki applications (e.g., BlackBoard and SchoolFusion).

Summary of Chapter

This chapter laid the groundwork for a third iteration of digital literacy research, exploring the use of open, participatory online applications (e.g., wikis) as a means of increasing student critical reading and writing skills. In the dual role of an embedded researcher and professional development instructor, I developed methods for collecting data which provided key information about guiding principles that had been developed in the first two iterations of research.

The design of this study provided a systematic method to seek clarification into the complex process of bringing New Literacies theory into the every-day instructional practices of K-12 classrooms. I used the model of a formative experiment (Reinking & Watkins, 2000) to initially develop the study, eventually framing the findings and implications within a single case study (Merriam, 1998). Due to the complexities of the phenomenon being studied, I designed data collection and analysis procedures with a mixed methods design, which utilized the strengths of both quantitative methods and qualitative methods (Creswell & Plano Clark, 2011).

Organization of the Remainder of the Study

I have divided the dissertation into six chapters including a reference section and appendices. In Chapter One I introduced the topic, defined the problem under study, and provided a brief overview of the methodology used for this current study, a third iteration

of digital literacy research. I also explained key information required for background understanding and listed key definitions for further clarification of the study's focus.

In Chapter Two, a review of literature significant to the research topic is presented, which includes Wallace's (2004) perspective of key affordances provided by offline and online educational resources. In addition, I provide foundational research from New Literacies theorists, epistemological research from socio-constructivist learning theorists, and literature connected to the content of the professional development intervention.

In Chapter Three, I discuss the original conceptualization of the study under the rationale of a formative experiment design (Reinking & Watkins, 2000). As part of this discussion, I explain important details from two earlier research studies that formed the guiding principles for this current study. I end Chapter Three with an explanation of my decision to frame the findings and results of this study as a case study.

Chapter Four outlines the methodology used in the study, including the rationale and purpose for the mixed methods design. I also detail the context of the case, the selection process for the participants in the study, and my development of the instruments used for data collection. I include a section about the data sources used in the study and how they align with the essential research questions. I also describe the data analysis and consolidation processes. Along with the measures that I used to provide reliability and validity to the analyses, I also discuss the limitations of the design methods.

Chapter Five provides a review of the findings. I first describe the qualitative and quantitative findings separately, then the results found after merging the data from all of the sources. In the last chapter, Chapter Six, I draw conclusions based upon the results of

the data analyses. I also discuss the implications when considering the restructuring of the guiding principles for future iterations of this research. I included examples of the data matrices developed during the data consolidation process in Appendix I, along with other examples from the study in the other appendices. These follow the reference list after Chapter Six.

CHAPTER TWO: LITERATURE REVIEW

Online collaborative applications appear as promising new educational tools that are readily adaptable to the public school classroom. However, the process of adopting these tools within traditional K-12 educational settings does not appear to be an easy task for classroom teachers. In this chapter, I begin with a framework developed by Wallace (2004) who outlines how the affordances of offline resources compare with those of online resources and why these differences may provide challenges to classroom teachers. Following this framework, I clarify the theoretical underpinnings of New Literacies research along with my epistemological stance based upon socio-constructivist learning theory. This also includes connections to literacy research and an explanation of the interworkings of a wiki, one online collaborative application highlighted in the study. I end the chapter with strands of research connected to the study, including the Common Core State Standards Initiative and the development of professional learning communities.

Topic sections include: (1) utilizing the Internet for academic purposes, (2) a New Literacies perspective, (3) developing professional development within a professional learning community model, (4) the epistemology of socio-constructivist learning theory, and (5) the literature used for the content of the professional development intervention.

Utilizing the Internet for Academic Purposes

During her research, Wallace (2004) sought understanding between the interaction of the Internet and the practices of teaching, asking "why it was so hard for the promises of the Internet to be realized in classrooms" and particularly, "whether …the nature of the Internet and the nature of teaching conflict with or support effective teaching with the Internet" (p. 449). Wallace (2004) explained that while digital literacy research had focused upon the effects of student learning, it had been slow to include research on content area teachers utilizing the technologies in their classrooms:

> …the Internet is not just a neutral tool that can be molded to the desires of a teacher or community. It has commanded enormous resources, financial and human, in schools across the country, and it continues to function as a source of pressure and frustration for many teachers and of excitement for others. Policymakers, administrators, and parents have, essentially, demanded that teachers use the Internet. That demand has not been accompanied by serious efforts to understand what it takes for teachers to be able to use the Internet effectively in teaching. In fact, when schools respond to the mantra "Train the teachers," they almost always neglect to answer the question, "To do what?" (p. 488)

Wallace (2004) identified five unique affordances which traditional teaching resources provide for classroom teachers. She then compared them to digital resources available through the Internet. She described an "affordance" not as a designed feature of the tool or application, but as a "product of the use of the resource" (p. 452). In other words, by utilizing certain design features of an educational resource, teachers build or enhance the

learning environments desired for their own students. The five affordances that Wallace (2004) compared between traditional offline resources and online resources included (1) boundaries, (2) authority, (3) stability, (4) pedagogical context, and (5) disciplinary context.

Boundaries

Traditional classroom resources provide boundaries, both intellectually and physically. For example, when teachers use textbooks, they can see what page their students are reading and then guide them to find the desired information. Teachers are familiar with their own textbooks, and thus familiar with the boundaries that the printed text provides for instructional purposes. In contrast, the nature of the Internet is boundless—geographically, intellectually, and politically. The boundary-breaking nature of the Internet is a primary motivator for much of the use of the Web (Richardson, 2010; Sharpe, et al., 2010). While a classroom computer provides a clear boundary for housing assignments or presentations, when teachers allow students to explore multidimensional hypertext with links, images, and video as part of the actual learning process, the traditional boundaries of printed text are either changed or erased. "Unlike a textbook, [the Web] is a door virtually open to boundless space" (Wallace, 2004, p. 453).

Authority

Author bias within traditional textbooks has been questioned on and off throughout the history of American education (Nehring, 2009; Rothstein, Jacobsen, & Wilder, 2008). However, for the most part, teachers who utilized textbooks or supplemental texts as traditional resources during the twentieth century were able to leave

the trustworthiness of the published content to the disciplinary experts. This is changing for teachers who are adapting to the openness of the Internet; the evaluation of texts for authority and bias has now been added to both planning time and instructional time (Wallace, 2004).

This skill of evaluating the authority of texts is one that is changing for both students and teachers. Collaborative features of online applications are shifting the issues related to authority, expertise, and the way that knowledge is collected and formed. This relates to the "collective intelligence" described by O'Reilly and Battelle (2009). When teachers allow students to search for multiple resources and collaboratively learn content information with the Internet, they must also guide their young learners how to establish the authors' authority and purpose. In order to provide boundaries and some structure to the content learning, teachers must sift through potential websites relevant to their curriculum and grade level, provide instructional time to teach students the evaluative process, and thus guide and teach this new skill. This transition away from the traditional, all-encompassing textbook for content information may add another layer of complication to Internet usage within the classroom and especially for teacher instructional planning time. (Lemke, 2010; Kay 2010).

This evaluative reading skill is one that needs to be learned by all twenty-first century readers. As advocated by New Literacies researchers (Coiro, Knobel, Lankshear, & Leu, 2008; Coiro, Leu, Burlingame, Hillinger, Kennedy, & Forzani, 2012; Leu, O'Bryne, et al., 2009), proponents of twenty-first century learning skills (P21, 2012), and the authors of the Core Standards (NGAC & CCSSO, 2010), the process of evaluating digital and print texts from multiple sources for relevancy and reliability—thus

establishing the authority and expertise of multiple texts— is a task that all K-12 students must now learn. As explained by Coiro (2003), "The nature of information on the Internet suggests new interpretations of these [literacy] processes, which demand all readers to adopt a more critical stance toward texts or risk being unknowingly tricked, persuaded, or biased" (*Broadening Understandings* section, 4th para.). Student proficiency in this evaluative process is an ultimate goal for all twenty-first century readers; however, the underlying instruction behind this new skill may take time for teachers to reconcile within their traditional curriculum and trusted, static resources.

Stability

In the past, teachers could depend upon textbooks to change slowly over time, which afforded a comfortable level of stability for both educators and the patrons in their communities. Most districts across the nation use textbook adoption cycles. Traditionally, groups of teachers, administrators, and other patrons come together every three to five years to reevaluate curriculum in context of the current standards or needs of the community, and then adopt an updated textbook from a reliable publishing company. To expedite the process, state departments of education have provided lists of approved textbooks for adoption committees to use. After the adoption process is completed and the new textbooks arrive, teachers start reading through the textbook teacher guides. Depending upon the new textbook series chosen, instructors from the publishing companies may provide additional in-service trainings. Teachers then build a library of additional texts to supplement weaknesses in the new edition of the textbook and search for additional resources to support students learning as needed. Since the advent of classroom computers in the 1980s and the introduction of the Internet to classrooms in

the 1990s, read-only digital text has become a staple part of the textbook adoption process (Gillmor, 2004; Sharpe, et al., 2010). Most all educational publishing companies include digital resources. Teachers regularly supplement their curriculum with information on compact discs (CDs), educational computer software, or supplemental texts that are downloaded off the Internet for instructional purposes. All of these types of digital texts are considered static, or stable. The information stored in these digital formats remains the same so that teachers can depend on using the same resources from year to year as they choose instructional strategies to guide student learning.

This stability of digital text has changed with advent of ubiquitous online editing tools. The Web is no longer a collection of static pages written in hypertext, and it can no longer be viewed as a digital storehouse or library where readers passively browse through information (Richardson, 2010; Sharpe, et al., 2010; Wesch, 2008). As described by Wallace (2004), “the fluid mutability of the Web is a plus—it means that teachers can find up-to-date information previously unavailable in school; that students can have access to information from points of view not usually represented in textbooks; that information in schools can be more varied and unconventional" (p. 478). However, the instability of online text can be an area of frustration for teachers who depend upon using the same sources of information from year to year. Hyperlinks rot. Sites disappear or change hands. This instability creates pedagogical problems: teachers cannot predict what will happen when students visit a website, even a website that has been previewed and successfully used in previous teaching experiences.

Pedagogical Context

Connected with this stability of resources and texts, teachers have grown dependent upon tangible, static materials for mediating student work (Wallace, 2004). Teachers have built their preferred pedagogical stance from years of experience using the same materials, the same labs, or the same learning tasks as a way to structure the learning environment and assess their students' success. This experiential pedagogical knowledge may make it even harder for teachers to shift their instructional preferences—if something has worked for the past ten years, then why must they change the way they teach? (Dede, 2010).

Wood (2000) described a hesitancy that may be caused when adult readers are required to move away from traditional, linear texts. This hesitancy may also be a factor for teachers when considering the adoption of nonlinear online texts and formats for instructional strategies. In addition, moving away from highly-structured texts for introducing basic concepts to students may be uncomfortable for those teachers who have only experienced the narrow approach of direct instruction (reading verbatim out of published teacher guides) throughout the past decade of the No Child Left Behind era (Nehring, 2009; Ravitch, 2010). So, for many reasons, teachers who have preferred a structured approach to their instruction, the deictic nature of the Internet pushes them out of their comfort zone.

Proponents of twenty-first century skills claim a shift away from traditional pedagogy is exactly what needs to happen in order to prepare K-12 students for career and college readiness (P21, 2012). As she described what new reading comprehension skills would look like in literacy instructional settings, Coiro (2003) said, "The Internet,

in particular, provides new text formats, new purposes for reading, and new ways to interact with information that can confuse and overwhelm people taught to extract meaning from only conventional print" (1st para.). Thus, in order for students to be prepared, they need to be taught new literacies skills and must be given more opportunities with "Web-based learning environments" that "can foster opportunities for more diverse knowledge gains, more personal applications, and higher levels of engagement" (Coiro, 2003, *Broadening Understandings* section, 7th para.). Texts on the Internet become interactive environments as opposed to static words on a page (Coiro & Castek, 2010).

Disciplinary Context

The last affordance of educational resources identified by Wallace (2004) is connected to disciplinary context. She described this as the manner in which traditional textbooks provided materials that contained carefully sequenced subject matter. In the past, teachers did not have to concern themselves as much with the appropriateness of resources for their particular discipline or their particular grade level; the curriculum publishers had provided a scope and sequence across all grade levels (Wallace, 2004). This affordance is also changing as teachers choose to use new resources from the Internet. Once teachers find an online resource, they need to find ways to integrate it into their own curriculum and disciplinary framework, ensuring that the material is age-appropriate, covers the desired content, and aligns with grade-level readability goals. As Wallace (2004) explained, "In some cases, Internet sites designed for education may provide resources that are consistent with requirements of subject matter teaching, but more frequently, teachers must do the work through their selection of resources, their

design of activities, and their interactions with students" (p. 480). This process of developing resources for instruction has always been part of the teaching profession, but utilizing online resources within a disciplinary context will, again, be something different that may be unexpected during the instructional planning process. While access to the newest information and newest disciplinary theories is seen as one of the greatest affordances of online resources (Lankshear & Knobel, 2011; Richardson, 2010), sifting through the proliferation of information may still be perceived as an extra time burden by teachers who must carefully guide the learning of their young students.

Connections to Current Study

I have described Wallace's (2004) framework regarding five affordances of traditional texts and educational resources—boundaries, authority, stability, pedagogical context, disciplinary context—as a way of organizing, contrasting, and discussing important differences between utilizing traditional, static resources and adapting to the deictic (ever-changing) nature of online, collaboratively-created resources. Her research was conducted at a time right before the explosion of Web 2.0 tools and applications (O'Reilly & Batelle, 2009; Richardson, 2010; Sharpe, et al., 2010), but it is still applicable to this current study in several ways. Wallace (2004) sought an understanding between the interaction of the Internet for academic purposes and the practices of teaching. She questioned why "the promises of the Internet" were so hard "to be realized in classrooms" (p. 449) almost a decade ago. As I started my research, I was also puzzled by this question; currently in the 2010s, the challenge for practicing teachers to embrace the use of the Internet still seems an enigma.

Another connection was stated in Wallace's (2004) comment, "The demand [for teachers to use the Internet] has not been accompanied by serious efforts to understand what it takes for teachers to be able to use the Internet effectively in teaching. … When schools respond to the mantra 'Train the teachers,' they almost always neglect to answer the question, 'To do what?'" (p. 488). Wallace asked this question in 2004. As I researched the literature for answers, this exact question surfaced again almost a decade later—both from the standpoint of a New Literacies perspective and the literature surrounding current professional development practices. These two topics will be discussed in the next two sections.

A New Literacies Perspective

Researchers in the field of New Literacies are encouraging educators to look beyond the actual technologies of the Internet and search for the underlying social practices it serves (Lankshear & Knobel, 2011). As explained by Leu and colleagues (Leu, O'Byrne, et al., 2009), this is an important distinction that must be discussed before progress will be made:

> [The research community needs] to see the Internet not as a technology but rather as a context in which to read, write, and communicate. The Internet is no more a technology than is a book; its functional affordances define it more than its technological affordances. Framing the Internet as a literacy issue, instead of a technology issue, is not a trivial matter for education. (p. 264)

New Literacies researchers have been building foundational theories about reading, writing, and collaboratively communicating with Information and Communication Technologies (ICT) tools, applications, or different media environments for educational

purposes for the past few decades. These theories form the underpinnings of this current study.

New Literacies

New Literacies researchers make a distinction between the uppercase version of the term (New Literacies) and the lowercase version of the term (new literacies). The meaning of the uppercase version (New Literacies) has evolved into a broader, more global concept of the term. Researchers of New Literacies have studied the evolution of digital literacy from many different perspectives, including the broader perspectives of Lankshear and Knobel (2011), the multimodality in online media (Lemke, 2010), new social practices (Street, 2003), new discourses (Gee, 2007), multiliteracies (New London Group, 1996; Sharpe, et al., 2010), or from the perspective of dispositions essential for online reading comprehension (Coiro & Castek, 2010; Coiro, 2003; Coiro, Leu, Burlingame, et al., 2012; Leu, Kinzer, et al., 2004). New Literacies researchers have adopted an open-source approach to theory development, encouraging everyone who studies the literacies of the Internet to contribute to the global theory. The National Council of Teachers of English (NCTE) adopted their definition for what they describe as 21st Century Literacies. It aligns with the global theories currently guiding New Literacies research:

> Literacy has always been a collection of cultural and communicative practices shared among members of particular groups. As society and technology change, so does literacy. Because technology has increased the intensity and complexity of literate environments, the twenty-first century demands that a literate person possess a wide range of abilities and competencies, many literacies. These

> literacies—from reading online newspapers to participating in virtual classrooms—are multiple, dynamic, and malleable. As in the past, they are inextricably linked with particular histories, life possibilities and social trajectories of individuals and groups. (NCTE 2008, n. p.)

This NCTE definition outlines key points from New Literacies theory. First, the definition of literacy includes a collection of "…cultural and communicative practices" – the writings, drawings, symbols, songs, or life stories of the people. Web 2.0 has now afforded readers and writers a multitude of hyperlinked, multiple-media, interactive formats to globally share these "many literacies." Readers and writers now require a new set of reading comprehension processes for these electronic text environments (Coiro, 2003). According to the New Literacies perspective, students must be taught differently in order to read, write, and communicate with multidimensional, nonlinear literacies of the Internet.

All these New Literacies elements emphasize the importance of "multiple, dynamic, and malleable" texts. These terms reference the affordance of stability which Wallace (2004) included in her framework, discussed in an earlier section. The New Literacies involving hypertext (e.g., text with embedded links, images, sounds, and videos) are powerful due to their dynamic and flexible nature. Unfortunately, for many practicing teachers, the strengths of this "dynamic malleability" are seen as an instability and weakness when comparing these interactive texts to the static texts of the past centuries.

new literacies

The lowercase version of new literacies connotes specific research work concerning the skills and dispositions needed to be literate in the online community. The research with new literacies skills is informing the global New Literacies theory. For this study, I focused upon the new literacies required for online reading comprehension evolving from the University of Connecticut. This group of researchers has studied the new literacies skills needed for making meaning of online text, which is often defined as a process of self-directed text construction (Coiro & Dobler, 2007; Leu, McVerry, O'Byrne, Zawlinskis, Castek, & Harman, 2010).

As an example of new literacies theory transitioning into literacy practice, the International Reading Association (IRA) began their position statement entitled *New Literacies and 21st-Century Technologies* with the following statement: "To become fully literate in today's world, students must become proficient in the new literacies of 21st-century technologies. IRA believes that literacy educators have a responsibility to integrate information and communication technologies (ICTs) into the curriculum, to prepare students for the futures they deserve" (IRA, 2009, *About IRA* page). These online reading comprehension skills, described as lowercase new literacies skills, were contrasted to traditional reading skills by Coiro (2003):

> With traditional texts, prereading thought processes focus on questions such as the following: What will happen next? What do I know about this topic? What is the author's purpose? What do I expect to learn from this text?
>
> …Within interactive Web-based environments, however, proficient readers also need to plan answers to questions like these: How should I navigate this

> information? How can I expect to interact with this environment? What is my role or task in this activity? How can I add to this body of knowledge? (*Broadening Understandings* section, 8th para.)

Along with the changes in prereading processes described by Coiro (2003), above, she defined other unique strategies that a reader of hypertext must learn in order to read for meaning during the reading process. This is caused by the nonlinearity of online hypertexts; readers rarely read from the beginning to the end: "A reader must understand the advantages and disadvantages associated with having ultimate control of the direction in which text progresses and use inferential reasoning skills and context clues to discern one type of hyperlink from another" (*Broadening Understandings* section, 2nd para.). Again, Coiro (2003) highlights the uniqueness of self-directed text construction, an important part of the new literacies skills which must be taught to young readers and writers.

Online Reading Comprehension Skills

In the 1990s, new literacies researchers began studying the differences between reading comprehension skills required by offline texts and compared these skills to those needed for comprehending the multidimensional texts used on the Internet. Researchers first reported a difference in reading habits when observing students interacting with text resulting from an Internet search (Eagleton, 1999; Sutherland-Smith, 2002). These researchers noted that many student readers became easily frustrated when they couldn't quickly find the answers to their search. Students adopted a "snatch and grab philosophy" while reading online (Sutherland-Smith, 2002, p. 664) which involved little thought or critical evaluation. As noted by Coiro (2003), "these shallow, random, and

often passive interactions with text [were] in direct contrast to the active, strategic, and critical processes of constructing meaning now being proposed by instructional leaders and supported by 25 years of reading research" (2nd para.).

New literacies researchers have identified reading processing practices that must be acquired to proficiently comprehend online texts (Coiro, 2003; Coiro & Dobler, 2009; Leu, Kinzer, et al., 2004; Leu, O'Bryne, et al., 2009; Leu, McVerry, et al., 2010). These online reading practices include (1) reading to identify important questions, (2) reading to locate information, (3) reading to evaluate information critically, (4) reading to synthesize information, and (5) reading and writing to communicate information. While these reading comprehension skills require similar strategies to offline reading, there are additional ones unique to the reading comprehension of the Internet (Leu, O'Byrne, et al., 2009).

Implications for Online Literacy Instruction

The students of today are described as "digital natives"(Prensky, 2001) who are skilled with many digital literacy skills such as social networking with friends, texting, online gaming, or downloading and creating videos with images and sound with the use of online tools. However, teachers cannot assume these same skills will transfer for academic purposes in the classroom (Leu, Reinking, et al., 2007; Sharpe, et al., 2010). Online literacy skills must be taught, especially the skills involving locating relevant material, critically evaluating the trustworthiness of authorship, summarizing ideas from multiple sources, and then effectively communicating the information learned with others.

Participatory learning. Developing online learning environments for students requires "novel skills, strategies, and dispositions for their effective use" (Dede, 2010, p. 67); one of these "novel" skills is the idea of collaborative, participatory learning. The participatory nature of the Web (Coiro, 2005; Lankshear & Knobel, 2011; Richardson, 2010) is often considered the part that is new or novel, and is what educators need to integrate into their curriculum (Sharpe, et al., 2010). Learning new literacies skills with online applications such as wikis and blogs have been labeled as "practical, inevitable, and even transformational" (Lee & Young, 2011, Introduction section, para. 2) within educational learning environments.

Lankshear and Knobel (2011) argue that the 'new participatory' nature of new literacies skills is just as important, if not more important, that the 'new technologies' that afford people the ability to encode texts into the proliferation of new formats. Some of these new formats Lanshear and Knobel (2011) list include "blogging, fanfic writing, manga producing, meme-ing, photoshopping, anime music video practices, podcasting, vodcasting, and video gaming." These "are literacies along with letter writing, keeping a diary, maintaining records, running a paper-based zine, reading literary novels, note-making during conference presentation or lectures, reading bus time tables, and so on" (p. 51). Their point, throughout their book, is to stretch the reader's mind beyond traditionally-produced texts, into a broader concept of "socially recognized ways in which people generate, communicate, and negotiate meanings" (p. 51) as members of Discourses (Gee, 2007). Lankshear and Knobel (2011) place the emphasis on the sociality of the new texts, the "popular participation and collaboration typically associated with new literacies in Web 2.0 environments" (p. 76). They describe this

participatory nature of new literacies as "'new ethos stuff,'" which integrates "interactivity, participation, collaboration, and the distribution and dispersal of expertise and intelligence" (p. 76).

Lankshear and Knobel (2011) give example after example of everyday people, especially the young people of today, who jump into the participatory world of Web 2.0 discourses with ease: they are "renowned for picking up, running with, re-purposing, and re-shaping new technologies with an ease analogous to the proverbial duck taking to water, without any need for formal instruction in technology use" (p. 88). But what is missing, Lanshear and Knobel explain, is the 'new ethos stuff' –guidance in how to participate for academic purposes. As they explain, "without a change of 'ethos' within education, the benefits from addressing the 'new technical stuff' will remain seriously constrained" (p. 88). In other words, students may not need too much guidance to figure out the technology, but they do need guidance in how to learn and how to participate while learning. This is the 'new' part of new literacies practices (Lankshear & Knobel, 2011).

Students appear to learn online reading comprehension skills best from other students within the context of challenging activities designed by their teachers (Coiro & Castek, 2010). The participatory nature of Web 2.0 texts, while both engaging and motivating for students, provides more than just novelty to instructional practices. Participatory learning creates an environment that "promotes higher level thinking, communication skills, and deeper understandings of text" (Coiro, 2003, *Broadening Understandings* section, 1st para.). The RAND Reading Study Group (Snow, 2002) also highlighted the importance of reading comprehension as a social activity: "The three

elements of reading comprehension—the text, the activity and the reader—occur within a larger sociocultural context" (p. xv).

Thus, if the goal of the instruction is to increase higher level thinking and communication skills, along with deeper understandings of text, learners must be given opportunities to interpret and share information with others. While collaborative learning can happen—and should happen— within the confines of traditional school settings with local (offline) technology tools, the globally networked environments must also be explored in order to prepare students for their futures (P21, 2012). These environments include the immediate feedback from peers and adults, along with opportunities to share with real global audiences. In their position statement, the IRA (2009) promotes a new literacies curriculum that offers "opportunities for collaboration with peers around the world" and "instruction that embeds critical and culturally sensitive thinking into practice." This curriculum must be taught by "teachers who use ICTs skillfully for teaching and learning" and involve "peers who use ICTs responsibly and who share their knowledge" (*About IRA* page).

This concept of collectively constructing knowledge in a participatory environment will require a pedagogical shift for many content area teachers who have taught in isolated classrooms throughout their careers. DuFour and DuFour (2010) describe these traditional, isolated instructional environments as "egg-carton classrooms;" every teacher is separated by the barriers of the classroom walls and is responsible for the learning that takes place inside those walls. Teachers in these settings admonish students "not to cheat off others" and generally expect students to read, think, and write individually. Most traditional assessment procedures have also followed this

mode of isolationism; common testing environments require that students are quiet and working individually. DuFour and DuFour (2010) showed concern about the continuance of this isolated approach to learning: "Teachers who work in isolation will never help all students learn at high levels" (p. 79). Lemke (2010) also discussed this concern, contending that educators must be collectively responsible to "ensure that today's students are ready to live, learn, work, and thrive" in today's world (Lemke, 2010, p. 244). Collaborative online applications such as wikis and blogs may help teachers transition to a more collaborative, interactive learning environment.

Wikis: An example of Collaborative Online Spaces. A wiki is an example of a collaborative online application that can be used for educational purposes. I created and used one throughout the professional development course used in this study. Other researchers have also utilized the wiki's collaborative features to study various aspects of online education (Gibbons, 2010; Karasavvidis, 2010; Lee & Young, 2011; Lutcher, 2011; Ryan, 2007; Tysseling & McCulley, 2012). Wikis are open-source software applications used for designing socially-constructed websites, also described as web-based interfaces (Lee & Young, 2011). Wikis support multiple users who can collaboratively create and publish multimedia content either in a public or private environment. Wikis were first developed by Ward Cunningham in 1995 and named after the Hawaiian word "wiki-wiki" meaning "quick" (Cunningham & Leuf, 2001). The quickness of the wiki online web editing software is due to its use of simplified markup language. Teachers and students can create, collaborate, combine, and publish their ideas on a wiki application that has similar features common to most websites. These common features allow their collaboratively-produced product to look and work like

most other webpages (Richardson, 2010). Other digital tools or applications (i.e., YouTube videos, Google gadgets, documents, spreadsheets, and most digital images) can be hyperlinked or often embedded directly into the wiki website, making it an excellent digital space for coordinating and sharing digital information. There are currently hundreds of free wiki applications available including Wikispaces, PBwiki, WetPaint, and Google Sites. When a new wiki is created, the owner designs a basic framework and then invites others to read and add content to the new site. Wiki owners can also control different levels of access, limiting both viewing and editing rights as needed for security. The ability to limit viewing and editing privileges is an important feature for creating structured learning environments. Teachers can create the wiki and then choose who may view or edit the website. During the learning process, the wiki can remain closed to outside viewers. When students are ready to unveil their work to the global community, teachers can easily change the settings to allow for public access.

With the advent of the wiki and similar collaborative applications, “learners now have a much richer and more complex set of communicative tools" (Sharpe, et al., 2010, p. 17). Wikis have had a substantial effect on news reporting, business, politics, and information sharing around the globe, but are still relatively new to K -12 classrooms (Heafner & Friedman, 2010; Richardson, 2010; Tarasuik, 2010) and teacher education courses (Lee & Young, 2011; Tysseling & McCulley, 2012).

Wikis are only one type of participatory online applications. In his post titled “*The 10 Most Popular Teacher Tools Being Used this Year,*” Dunn (2013) listed the following online applications: Twitter, Skype in the Classroom, Google Drive and Google Hangout, YouTube, Evernote, Dropbox, Edmodo, blogging sites such as WordPress , and

Socrative. I noticed that no wiki applications appeared on his list. Socrative, an interactive site designed for online discussion, is currently adding more than 1000 new users a day (Dunn, 2013). While all of these online applications have features that support collaboration, it is important to mention that not all text made with these applications is collaboratively produced; individual users still create text for one-way communication. The intent here is to provide examples of current online applications, beyond wikis, that may be used for participatory learning environments. As another example, Prezi.com is an application that is most commonly used for creating presentations, or one-way communications. Prezi does have a sharing feature that is not as well-known, which provides a means for multiple users to create text at the same time. In this synchronous Prezi environment, multiple users appear as avatars with name labels, creating a highly-motivating participatory environment for junior high students (McCulley, 2012).

Developing Professional Development to Effect Change

Recent technological breakthroughs have been likened to the invention of the printing press, which caused societal upheavals in its day as commoners were allowed access to the printed word for the first time (Gilmor, 2004; Greenblatt, 2010). As with past interventions which created shifts in global economies and culture, the current use of the Internet within educational institutions appears to be creating new tensions. Richardson (2010), an educational blogger and proponent of integrating new technologies into classrooms, describes the interactive, participatory nature of the Internet as the "Read/Write Web" in reference to the new capability for multiple users to create and edit digital text with online applications. In his book that describes how teachers can utilize

blogs, wikis, podcasts, and Really Simple Syndication (RSS) feeds, Richardson (2010), explained that "…the new Read/Write Web is causing a 'tectonic shift' in the world. Anything that changes the way groups get things done will affect society as a whole" (p. 3). This transformational shift is rapidly changing the way society engages in politics, journalism, media, and business, and how average citizens communicate with famous experts, authors, and even friends (Richardson, 2010). For the first time in over 500 years of stabilized print, traditional communication systems around the world have been challenged, especially within established learning institutions.

In order to create learning environments where students are encouraged to read, write, and communicate with online collaborative applications, many teachers may need to rethink their pedagogical practices. Schmoker (2010) discussed his observations as a rationale for this pedagogical change:

> I once saw an estimate that 50 years ago students graduated from high school knowing 75% of what they would need to know for the rest of their lives—in the workplace, in their families, and for life in general. The estimate today is that graduates of our schools leave knowing perhaps 2% of what they will need to know in the future. And yet they leave school today knowing far more than they did 50 years ago. As we have learned, knowledge doubles every 3 years; technology goes through a new generation every 18 months. The concept that one can learn, once and for all, all the information and skills needed for life, if it ever had merit, clearly no longer does. John Dewey stated it perfectly nearly a century ago: "The most important attitude that can be formed is that of the desire to go on learning." (p. 117)

In his quotation above, Schmoker (2010) references a quote from Dewey, alluding to the fact that this pedagogical thinking is quite old. This style of instruction, however, also called "student-centered" (Sandholtz, Ringstaff, & Dwyer, 1997) or "discovery learning" (Bruner, 1986), may be considered as radical thinking for many teachers who started their careers after 2001. As a legacy of the No Child Left Behind (NCLB) Act of 2001, many American teachers have only experienced a style of teaching that was developed for "failing schools." During the past decade, schools that could not meet the annual yearly growth requirements of NCLB often adopted narrow, scripted instructional programs. These programs, antithetical to new literacies instruction, require teachers to read instructions to the students word-for-word from the teacher instructional guides (Nehring, 2009: Ravitch, 2010).

Professional Learning Communities

A change in pedagogy of this magnitude will take time and collaborative effort as classroom teachers attempt to shift their thinking to accommodate new literacies instructional practices. And for this shift to happen effectively, practicing teachers must be given time to learn and adopt a new literacies perspective within their current practice in real classrooms. In order for teachers to make this pedagogical shift—to teach the processes of learning in a collective fashion rather than slog through volumes of isolated, factual knowledge—they need time to collaboratively encourage and guide each other as well as their students. The one-day in-service approach, one of the most commonly-used professional development models practiced throughout the 1990s and 2000s in the United States, does not afford this type of deep-rooted change (Belanca & Brandt, 2005; DuFour, Eaker, & DuFour, 2005). Referring again to DuFour and DuFour's (2010) description of

"egg-carton classrooms," teachers can no longer survive in an isolated educational setting if they are responsible to provide today's students with the skills that they need to "live, learn, work, and thrive in this high-tech, global, highly participatory world" (Lemke, 2010, p. 244).

Many education reformers discuss the need for teachers to form smaller, within-school professional teams to accomplish a gradual pedagogical shift over time within the daily practice of classroom teaching (Bellanca & Brandt, 2010; DuFour, Eaker, & DuFour, 2005). Shifting teachers' deeply-rooted instructional practices is often a challenging process. Educational reformers and researchers confirm this necessity to collectively shift pedagogical thinking, away from the narrowness of teaching and assessment practices that have become the aftermath of high-stakes testing of the past decade (Nehring, 2009; Rothstein, et al., 2008), toward broader learning outcomes that require different instructional methods and assessment (Bellanca & Brandt, 2010; Stiggins, 2005). Part of this shift can be seen in a different model for training classroom teachers, often described as a professional learning community or PLC, which encourages teachers to shift pedagogical practices gradually over time, in a collective, collaborative fashion.

The idea of forming professional learning communities (PLCs) as a school-embedded professional development model for engaging and motivating teachers to make changes in their pedagogical thinking is gaining momentum across the country (DuFour, et al., 2005). A growing body of research confirms that "school-embedded professional learning opportunities" provide effective environments "to increase knowledge and skills or changes in classroom practice" (Dillon, et al., 2011, p. 642). In particular, educational

reformists interested in developing new literacies skills in schools support this model (Kay, 2010).

As related to this current research, the district represented in this study had established PLCs in all three of the junior high schools. This became an important part of my intervention planning. The host school, Hawk Bluff, had chosen a school-wide focus for their PLCs, as part of their commitment to their AVID college readiness program, to increase critical reading and writing skills for all students. My chosen intervention aligned well with this commitment to improve reading instruction across all content areas. Hawk Bluff's intact professional development platform which connected to the study's goals, along with a population of participants open for new ideas, had the potential to remove negative factors that could prevent success in other similar studies.

Epistemology of Socio-Constructivist Learning Theory

Socio-constructivists recognize the importance of language and social interactions in learning how to read and write (Snow, Burns, & Griffin, 1998). This learning theory directly applies to the idea of new literacies practices which require social interactions for meaningful learning to take place (Knobel & Lankshear, 2011). Knowledge is represented in the individual's mind as an ever-closer approximation of how the world really is (Dewey, 1938). The exchange of language helps students organize their thoughts as they learn to communicate and share experiences with others (Vygotsky, 1986). There is an assumption that knowledge is constructed by learners as they attempt to make sense of their experiences. Learners devise strategies for searching and finding out about relationships around them, then transform their thinking to accommodate or assimilate new information.

This process is individualistically-paced and it is not smooth; it is generally a messy, holistic, web of knowledge acquisition over time. The socio-constructivist learning process is best accomplished through social interactions that are scaffolded within a learners' zone of proximal development. Vygotsky (1986) described the learner's zone of proximal development as a desired range of tasks between students' actual developmental level and their potential development. In other words, students learn best when stretched beyond what they can perform independently and into an environment where they need guidance or instruction by a teacher, often described as their instructional level.

For this level of learning to be effective, especially when learning more-challenging tasks, it must be guided, or scaffolded. As explained by Bruner (1986), this transference of knowledge is discovered by the learner through carefully-created steps; it is a structured process, something that Bruner described as discovery learning. This process allows the learner an opportunity to discover information within a scientific inquiry, determining what variables are relevant, sorting through information, analyzing and synthesizing to derive conclusions (Bruner, 1986). It is a systematic comparison of examples and non-examples as learners discover and construct their own meanings and understandings. Then, as learners become more competent, the scaffolded framework is removed as they gain independence with the new skills and knowledge. Within this learning environment, the *process* of learning becomes more important than the *conten*t of the learning (Sharpe, et al., 2010).

Literacy researchers use the socio-constructivist learning theory to explain the reading /writing process. Tierney (2009), a current literacy researcher, described the new

literacies reading process as the "artistry" of meaning making: "Webs of images and texts, digital games or simulated environments are akin to scripts waiting to be enacted or scores to be played or dances to creatively pursue" (Tierney, 2009, p. 262). Authors of hypertext create "a kind of nonlinearity and multidimensionality" that is only possible within this new online medium. When reading hypertext—embedded with images, sounds, speech, and writing —"our meaning making journeys may appear to follow, parallel, or be inscribed by others, but we all have our own imprint, swagger, or emerging meanings which ricochet or become compounded with one another as we wander through text" (p. 262). Tierney described the meaning-making process of the online world: as online readers and writers interact with hypertext, meaning-making becomes powerfully alive.

The idea of humans collectively constructing knowledge from personal experience or from interactions with various forms of text is not at all new (Bruner, 1986; Dewey, 1938; Vygotsky, 1986), but some of the current teaching practices that have been engrained into the American public education system appear to be blocking the accommodations needed to incorporate this "new" way of teaching and learning into existing educational systems. The instructional practices required for learning new literacies skills are centered within the epistemological stance of socio-constructivist learning theory. From the socio-constructivist perspective, students must engage in social interactions—face-to-face, video, and in written online conversations—in order to develop reading, writing, and communication skills. This learning process is individualistic and not necessarily linear, as different readers jump to different pieces

within the online texts. In addition, readers construct meaning from the text using their past experiences and knowledge.

Literature Related to Content of Professional Development Course

In this section I will discuss the literature reviewed as I developed the content for the professional development course used as the study's intervention.

Common Core State Standards Initiative

The Core Standards are a catalyst for change within the American education system (P21, 2010), guiding educators as they retool instruction to meet twenty-first century literacy and technology goals. Currently, forty-five states, the District of Columbia, four territories, and the Department of Defense Education Activity have adopted the Common Core State Standards (NGAC & CCSSO, 2012). On the state department website, these standards are now called the Idaho Core Standards (Idaho Department of Education, 2013). The state of Idaho plans to transition to the SMARTER Balanced (SBAC) assessments in the year 2014-2015. The SBACs will replace the Idaho Standardized Achievement Tests (ISATs) which were created to align with the No Child Left Behind (NCLB) Act of 2001.

The authors of the CCSS intentionally connected and integrated technology and literacy throughout the standards. Literacy skills (reading, writing, speaking, listening, and language) as well as technology skills are embedded within the grade-specific standards. Throughout the standards, an emphasis is placed upon instruction that is collaborative in nature. As an example, the following is a side note found on the

speaking and listening anchor strand page in the English Language Arts handbook (NGAC & CCSSO, 2010):

> To build a foundation for college and career readiness, students must have ample opportunities to take part in a variety of rich, structured conversations—as part of a whole class, in small groups, and with a partner. Being productive members of these conversations requires that students contribute accurate, relevant information; respond to and develop what others have said; make comparisons and contrasts; and analyze and synthesize a multitude of ideas in various domains.
>
> New technologies have broadened and expanded the role that speaking and listening play in acquiring and sharing knowledge and have tightened their link to other forms of communication. Digital texts confront students with the potential for continually updated content and dynamically changing combinations of words, graphics, images, hyperlinks, and embedded video and audio. (p. 22)

In the quotation above, the first paragraph explains the rationale for teachers to provide opportunities for collaborative learning. Then, in the next paragraph, this rationale is expanded to include new technologies and their role for developing speaking and listening skills. This connection between collaboration and new technologies, written throughout the standards, became an important link that I utilized while constructing the content for my professional development course. The creation of online learning spaces broadens students' abilities to share knowledge within global communities. These positive experiences will help build critical thinking as well as collaborative communication skills.

Partnership for 21st Century Skills

In 2002 the United States Department of Education provided one and a half million dollars in matching funds to form the Partnership for 21st Century Skills. This coalition has served "as a catalyst to position twenty-first century readiness at the center of United States K-12 education by building collaborative partnerships among education, business, community and government leaders" (P21, 2012, *About Us* page). The P21 website provides resources and tools for educators interested in aligning "classroom environments with real world environments" (P21, 2012, homepage, 1st para.*)*. I used their framework to help teacher participants connect their core content areas with what the Partnership coalition describe as the "4Cs:" Critical thinking & problem solving; Communication; Collaboration; Creativity & innovation. These four skills are described as the skills needed for success in college, career, and life in the twenty-first century. (P21, 2012, *framework* page).

Critical Reading and Writing Connections

The host school for this study was part of the Advancement Via Individual Determination (AVID) college readiness program. The professional learning communities (PLCs) in the school were reading and discussing a text from the AVID program called "*Critical Reading: Deep Reading Strategies for Expository Texts"* (LeMaster, 2011). The theme of this text—to increase critical reading and writing skills across all content areas—was also the goal of the school's PLCs. I incorporated several of the critical reading and writing strategies from the book into the content for the professional development course used in this study. These strategies for improving critical reading and writing involved engaging students in collaborative learning

activities, which fit well within the new literacies perspective, both in terminology and instructional practices.

Information from these three resources—the CCSS Initiative Handbook, the Partnerships for 21st Century framework, and AVID's critical reading strategies text—informed my thinking as I developed the course content. A common thread seen in all of this literature was the need to integrate technology, literacy, and collaboration skills within all K-12 subjects to prepare students for life and work in the twenty-first century.

Summary of Chapter

Tierney (2009) wrote, "We seem to be approaching a confluence, verging on zeitgeist, as researchers, theorists and applied scholars encourage our rethinking the nature of literacy practices and meaning making, especially within and across new and changing digital environments. …The magnitude of these shifts should not be underestimated" (p. 261). This chapter reviewed the magnitude of this shift: rethinking how teachers teach and how students learn the reading and writing process to integrate the collaborative nature of the Internet.

CHAPTER THREE: ORIGINAL STUDY CONCEPTUALIZATION

The original framework for this research project was conceptualized within a formative experiment model. In this chapter, I will discuss the reasons why I first chose a formative experiment model and how I had originally framed my research questions and the intervention within a formative experiment. As part of this discussion, I will include the theoretical foundations of a formative experiment. I will close this chapter with an explanation of the factors which led to a transition to the case study framework which is discussed in Chapter Four to describe the findings and implications in the last two chapters of this dissertation.

Before describing this transition, it is essential that I include an important clarification. The original intent of this study and the mixed methodology which was implemented throughout the data collection and analysis cycles during the study did not change. This consistency in methodology throughout the research planning and implementation stages becomes an important factor when weighing the integrity of my findings. What did change, as I will describe in this chapter, was the research framework. Events at the beginning of the intervention prevented me from continuing my pedagogical goal, a key component of a formative experiment design. By moving away from the formative experiment model and framing my research within a case study, I was able to organize my findings in a way that provided clearer insight and understanding.

Framework of a Formative Experiment

I will first discuss current research from the literature about the formative experiment model, particularly from the standpoint of digital literacy researchers who have demonstrated the value of this framework for those who work with practicing teachers in actual classroom settings. Literacy researchers working in classroom settings have shifted to this different methodological framework over the past years. It offers many strengths when studying an innovative idea in a natural environment. Researchers describe this as a pragmatic epistemological stance, as the formative experiment model allows the innovation or intervention to be adjusted or improved while it is being studied "without limiting [researchers] to predetermined categories, interests, boundaries, and narratives" (Reinking & Watkins, 2000, p. 398). In general, it is called design-based research (Jacob, 1992; Herrington, et al., 2007). More specifically, literacy researchers describe it as a formative experiment model (Bradley & Reinking, 2011a; Fisher, Fry, & Lapp, 2009; Ivey and Broaddus, 2007; Lenski, 2001; Neuman, 1999; Reinking & Watkins, 2000). The general framework of design-based research provides a structure for understanding how, when, and why educational innovations work in practice. Often a central component in educational inquiry, this framework focuses and clarifies researching efforts that "foster learning, create useable knowledge, and advance theories of learning and teaching in complex settings" (Design-Based Research Collective, 2003, p. 5).

With design-based research, most commonly called formative experiments in the digital literacy field, researchers aim to identify and understand the variables and factors that may be influencing or blocking the intervention's effectiveness (e.g., (Ivey &

Broaddus, 2007; Jacob, 1992; Reinking & Watkins, 2000). As these variables or factors are identified, the intervention is intentionally modified or adapted during the study. The data collection and analysis process are ongoing during all stages of the intervention, and data-based decisions to alter parts of the intervention are carefully monitored and observed. This is in direct contrast to the traditional experimental model in which researchers remain separated from the experiment and the subjects in a carefully constructed and controlled fashion. Bradley and Reinking (2011a) do suggest that the traditional experimental model, "the [national] gold standard for implementing scientifically based reading instruction" since the 2000s, has provided useful information for what works best on average, "typically defined narrowly as instruction that results in statistically superior student achievement based on quantifiable measures" (p. 189). However, they argue, this experimental model does not provide guidance for a successful implementation of an intervention within any "real" educational environment:

> Focusing on tournament-style research to see which instructional interventions are left standing after experimental comparisons also promotes misguide notions such as best practice, which is an unattainable goal in any absolute sense and likewise devalues professional judgment. (p. 190)

As explained further by Bradley and Reinking (2011a), a formative experiment model, "unlike experimental or naturalistic studies of instructional interventions," can "accommodate both the variation inherent in classrooms and the need to adapt interventions in response to relevant variation" (p. 191). In this way, researchers gain a clearer understanding how the factors affect the intervention, especially as it undergoes changes within a real classroom or other setting.

The Design-Based Research Collective (D-BRC), a group of researchers dedicated to promoting the design-based model, was founded in 1999 "to examine improve, and practice design-based research methods in education" (D-BRC, 2003, p. 8). In their descriptions of design-based research—the general term that includes the formative experiment research model—they deliberately avoided terminology that described other models such as "design experiments" or "trial teaching methods," both terms often confused with design-based research. They clarified that design-based research methods bridge theoretical research and practice while maintaining "objectivity, reliability, and validity. …[These] are all necessary to make design-based research a scientifically sound enterprise … by grounding itself in the needs, constraints, and interactions of local practice" (p. 8). Thus, researchers from the D-BRC claim that design-based research provides a lens for understanding the transformation of theoretical claims into effective learning practices. According to Reeves, Herrington, & Oliver (2001), design-based research is not an actual *methodology* in of itself, but a research *approach* that relies on techniques used in other research paradigms, like thick descriptive datasets (Geertz, 1973), systematic analysis of data with carefully defined measures, and consensus building within the field around interpretations of data. Herrington and colleagues (2007) consolidated three main methodological requirements for design-based research, borrowing from the seminal work of Brown (1992) and Collins (1992):

> (1) addressing complex problems in real contexts in collaboration with practitioners;

> (2) integrating known and hypothetical design principles with technological affordances to render plausible solutions to these complex problems; and
>
> (3) conducting rigorous and reflective inquiry to test and refine innovative learning environments as well as to define new design principles (p. 4091)

The main advantage of design-based research is its flexibility to address complex problems in real contexts with practitioners (Brown, 1992; D-BRC, 2003; Herrington, et al., 2007; Reinking, 2010). Although there are always trade-offs between laboratory settings which allow for experimental control and "involving real classroom settings which allow for richness and reality" (Brown, 1992, p. 153), this advantage of design-based research holds promise for research such as this study, providing "an alternative model for inquiry" (Herrington, et al., 2007, p. 4089) for exploring technological innovations such as integrating online collaborative applications into K-12 curricula.

Socio-Constructivist Connections

One of my main reasons for choosing a formative experiment model for my research project were the connections between the formative experiment model and socio-constructivist learning theory. In the 1990s, Brown (1992) encouraged researchers to reconsider the work of Dewey (1938) and Vygotsky (1986) as she encouraged educators to guide learners in terms of what she described as *guided discovery*. Within her design models, she encouraged "setting up cooperative learning situations, establishing a classroom ethos where individual responsibility and group collaboration are the norm" (Brown, 1992, p. 166). She expounded on both Dewey and Vygotskian theories, stressing "the need to situate curriculum activity in the lives of children. …Curricula should reflect the child's lived experience and provide continuity with the

family and community life" (p. 170). What Brown labeled as guided discovery several decades ago fits the pedagogy needed for effectively teaching the new literacies skills of today.

Brown, a literacy researcher for strategic reading comprehension strategies throughout the 1970s and 1980s (Brown and Palinscar, 1982), as well as an early advocate of design-based research (Brown, 1992), admonished educators to consider all of the aspects "that our learning environment [was] set up to foster, such as problem solving, critical thinking, and reflective learning" (Brown, 1992, p. 143). She first called her pragmatist model *"design experiments"* after Collins' (1992) seminal work.

Original Formative Experiment Designed for Study

Within their digital literacy research work regarding fourth and fifth graders using HyperCard 2.1 to create multimedia book reviews, Reinking and Watkins (2000) outlined key steps for a formative experiment. These steps have now become key guidelines for other digital literacy researchers as they have formulated their research (Baumann, Ware & Edwards, 2007; Bradley & Reinking, 2011a; Ivey & Broaddus, 2007). As explained by Reinking (2010), these key guidelines assist researchers to "create/ implement and theoretically understand an intervention that has potential to help educators achieve a valued pedagogical goal" (p. 21). These principles guided my initial planning steps for this research study.

Principles for Developing a Formative Experiment

The first step in the planning process of a formative experiment is to form a goal for the research project. Reinking (2010) describes this as an explicitly stated goal—one

that is valued and useful, and "justifiably has potential to enhance wellbeing and the attainment of a better world" (p. 21). Next, the researcher considers or creates an intervention that becomes the focus of the research. This focus is usually centered on a "research product," an intervention or innovation "with general design specifications suggesting the key ingredients that contribute to success or failure in achieving [the] valued goal" (p. 22). For literacy researchers, who often study the instructional practices involved in teaching the intervention, the explicitly stated goal is referred to as the pedagogical goal.

After the goal is in place and an intervention has been found or created, researchers form essential questions to frame the study. For the first essential question, researchers restate the pedagogical goal. In this way, it remains the focal point of the study. In the second essential question, researchers seek to uncover key factors which may "enhance or impede the effectiveness in achieving the pedagogical goal" (Reinking & Watkins, 2000, p. 388). This is an important feature of the formative experiment. Unlike experimental research models in which researchers wait until *after* the intervention to study the results, researchers using the formative experiment model study the key factors which might be agents of change *during* the study. As explained by Reinking and Watkins (2000), "formative experiments do not require comparisons among alternative interventions or control classrooms as in a conventional experiment" (p. 392). Thus, as key factors emerge from the on-going data collection and analysis cycles, embedded researchers are afforded the ability to adjust the intervention in order to increase the likelihood of accomplishing the pedagogical goal.

The last step to the formative experiment model involves intentionally developing steps for data collection and analyses over the timespan of the entire intervention. This is an important piece of the formative experiment model, as it establishes a process to strengthen the internal and external validity and trustworthiness of the research. Reinking and Watkins (2000) implemented methods for collecting both quantitative and qualitative data for their research, aligning their methodology with the work of Tashakkori and Teddlie (1998) who describe this as mixed methodologies. This connection between the formative experiment model and mixed research methods became a key piece as I planned my research methods for this study. In particular, the model developed by Reinking and Watkins (2000), demonstrated how to describe the on-going research process over the duration of the intervention as a means of enhancing the internal validity of their research, which I also followed during my intervention. This process aligns with the work of Krathwohl (1993), who first described this as "explanatory creditability." I followed this process—providing in-depth explanations of the data analysis process and how it was used to inform judgments made during the intervention—which also fit well with the convergent parallel mixed methods design (Creswell & Plano Clark, 2011) that I chose for this study.

The connections between the formative experiment model, the mixed methods research design, and my epistemological stance within the socio-constructivist learning theory all synergized to form the original design model for this study. This also appeared to be an excellent fit for the phenomenon that I wanted to study, that of providing teachers opportunities to learn and construct online collaborative applications for their classrooms. As explained by Reinking and Watkins (2000),

> Formative experiments may be especially applicable to conducting classroom research aimed at investigating computer-based interventions because of the expected advantages of such interventions have been difficult to achieve [in the past]. …On the one hand, it is clear that much of the interest in educational uses of computers has been related to the belief that they have strong potential to transform positively the standard modes of teaching and learning in schools. …On the other hand, it is also clear that simply introducing innovative, powerful, computer-based activities into a classroom is often not enough to realize this potential. (p. 387)

Construction of Formative Experiment for this Study

With the formative experiment model in mind, I constructed my original pedagogical goal for this study, which became my first research question: RQ #1: If teachers construct and implement units of study within their content area that use socially-constructed applications, will teachers be able to document positive student critical reading and writing growth in their classrooms? This pedagogical goal and research question focused upon my instructional strategies as a professional development instructor. In other words, I wanted to concentrate my research on teacher learning, not student learning. This did add a challenging level of complexity to the formative experiment; as I planned the experiment, I had to carefully separate teacher learning from student learning, which was not always easy to do. As an example, my first attempt at stating my goal and essential question crossed over into the student level: Will teachers be able to facilitate student-to-student online collaboration as a way to improve critical reading and writing skills? I did use this student-level question as I constructed the goals

and objectives for the professional development course, which became an important connection for the teacher participants throughout the intervention. However, for my research purposes, I removed student-level learning questions from my essential questions.

I also developed my second essential research question from the formative experiment model: RQ #2: What factors will enhance or inhibit the effective use of these online applications? I conducted my first cycle of data collection and analysis with this second question in mind. I generated the other original essential questions for the study as a means of exploring the data from both quantitative and qualitative perspectives. I wanted to measure the significance of gains perceived by the participants (RQ #3) as well as the depth of the changes (RQ #4).

Establishing Guidelines from Past Iterations

One important aspect of design-based research, which includes the formative experiment model, is that of conducting research in iterative cycles (Bradley & Reinking, 2011b; D-BRC, 2003). These iterative cycles guide researchers within the design-based framework as each new study builds upon the guidelines established by the previous study. Pedagogical goals are adjusted between the iterative cycles, but the phenomenon under study—generally innovative practices—remain the same. Thus, during each new iteration of the research, researchers utilize pre-established guidelines as they collect new data and observe possible factors which may inhibit or enhance the pedagogical goal. In this fashion, each iteration of research modifies or confirms old guidelines while establishing theories for future guidelines which inform improvements for the instructional strategy or innovation.

I developed my intervention—a three-month professional development course—based upon my past experiences as a professional development instructor, my readings from current research literature, research that I had recently conducted with my advisor (Tysseling & McCulley, 2012), and the pilot study that I conducted prior to this current research project (McCulley, 2012). Thus, the "known and hypothetical design principles" discovered through my foundational research work came together to form my "rigorous and reflective inquiry to test and refine" the chosen innovation or problem (Herrington, et al., 2007, p. 4091). I consider this current study as the third iteration of my research.

First Iteration. The first iteration was conducted with my advisor (Tysseling & McCulley, 2012). During this research, we explored the collaborative, participatory nature of seventeen wiki websites that Tysseling had constructed over a five-year period of time. She had created these wikis for instructional use in a variety of upper-division literacy courses with pre-service and in-service teachers. We collected and analyzed data from these wikis in an effort to establish guidelines for effective, collaborative online activities within the open nature of the wiki application. (The wikis were mostly utilized for specific class activities; few of the wikis supported fully online courses.) At the time that we started our work, there were very few guidelines for using wikis in the classroom. Most of the research studies available in the literature were isolated case studies involving one teacher in one classroom (Heafner & Friedman, 2010; Karasavvidis, 2010; Tarasuik, 2010), yet we continued to see their potential as a way to create collaborative, reflective spaces.

The foundational work for this research actually began in a separate study. In 2010 I joined with two other literacy colleagues researching differences between face-to-face discussions and online discussions. We started by collecting data from face-to-face conversations and planned to compare these data with student online discussions that were collected from a wiki created in a different section of the same course. This study was abandoned, mainly because of the pressure that was placed on the third colleague concerning her unfamiliarity with constructing wikis. I have mentioned this work here, as it definitely shaped my thoughts about planning future professional development instruction for practicing teachers in regard to collaborative online applications; it was not as easy as what I had originally thought.

Eventually Tysseling and I (2012) narrowed our research focus to the data collected specifically from the wikis that Tysseling had created, and thus I collaboratively completed my first research project in this area. Our main question, at that time, involved how to structure wikis to promote meaningful conversations and critical thinking. We contrasted a meaningful conversation against what we had defined as the "post and run" syndrome. This was the tendency of university students to post bits of unrelated information—often copied directly from an Internet site—into a threaded question posted by an instructor within the university's learning management system. Then, after responses were posted, students never returned to respond to what others had posted in a meaningful way.

The results from this first iteration helped us define what constitutes a meaningful online discussion demonstrating critical reading, writing, and communication skills. We were also able to conclude that the instructional strategies Tysseling had used during the

construction and implementation of the wikis within her university courses effectively created an environment that promoted positive growth in her students' critical literacy skills (Tysseling & McCulley, 2012). Implications from this study provided instructional guidelines for future use of wikis as an online learning tool. In order to prevent "post and run" and to encourage meaningful online conversations, these guidelines included (1) modeling exemplary responses prior to starting online conversations, (2) using a light touch when adding instructor comments to the student-to-student conversations, and (3) providing specific expectations for online collaboration on the grading rubric which was posted on a main page within the course wiki.

Second Iteration. I used guidelines developed from the first research iteration during my pilot study, which became my second successful research project with wikis (McCulley, 2012). During this study, I worked with two practicing middle school teachers who were excited to implement online applications for student use in their classrooms. While similar in their interests and pedagogical choices, their past experiences with Internet applications were vastly opposite. Bernadette, who taught an elective technology class for eighth graders and a combined reading/keyboarding for seventh graders, had first designed websites for NASA before becoming a teacher in a small, rural town. In contrast, Summer taught ninth grade English language arts classes in a large, urban setting. Summer had integrated the use of technology into her curriculum for student projects or presentation purposes, but had no previous experience with web design. Neither Summer nor Bernadette had tried using wikis for academic purposes before my pilot study.

Results from this second study confirmed the potential of using online collaborative applications as an instructional strategy that promoted student engagement and increased critical reading and writing skills. With my one-on-one coaching, Summer successfully created a wiki in Google Sites that she used for her students' reflective journaling. She successfully created and managed her online learning environment for approximately 80 students across three different periods during her district's required literature unit with the classic novel *To Kill a Mockingbird*. In addition to the students' individual webpages for their reflective journals, she developed webpages that held her unit objectives, her expectations and goals, and her assessment rubrics that she used for the unit. Together, Summer and I created a template for student "Netiquette," a list of things that she expected for her students when they collaborated in the online space (See Appendix I). This list included certain things that applied to the asynchronous nature of the wiki (e.g., "Think before you click: do not erase someone else's work." or "Do not bump your friend off a page. Only one editor allowed on a page.") The Netiquette page also listed her requirements for academic language (e.g., students had to write every entry in complete, grammatically correct sentences; no text talk was allowed). She also used the wiki to link her students to outside resources that were required for some of her instructional activities.

In contrast, Bernadette's district refused to give her permission to use Google Sites with her students, as all Google products require students to create personal g-mail accounts. At the time Bernadette's school server denied student access to all social networking sites, including most Google products. Bernadette and I worked around this problem by finding an online application that did not require individual email addresses.

We found a blogging application called KidBlog, and she needed no help creating a successful, well-structured online learning environment for her seventh grade reading students. I did coach her with the content for her project, however, by developing examples of reading projects from the literature in her reading textbook, which we called "Reading Quests." By the end of the pilot study, Bernadette was using one of my examples as a template and designing more reading units on her own.

Results from this pilot study demonstrated the contrasting needs of these two classroom teachers who were equally motivated to integrate new literacies skills into their curriculum. Bernadette required help restructuring her content; Summer required help structuring the technology. However, during follow-up interviews, both reflected upon their need—and appreciation—for my guidance during their professional learning journeys which led to their individual successes.

Guiding Principles for Third Iteration. With information gleaned from my readings of other published research studies, the foundational guidelines from the first iteration of the research with pre-service teachers, and the additional findings from my pilot study, I consolidated potential guidelines for instruction within the open, collaborative learning environment of wiki-like applications. The following four principles appeared to encourage positive, in-depth collaboration for the goal of increasing critical reading, writing, and online communication skills: (1) Adequate scaffolding was required both for instructing the teachers developing the wiki website as well as for students using the wiki. (2) Students required connections with an authentic task designed by the teacher, which did not include the actual task of learning the online application. The use of the application needed to be transparent during the learning

process. (3) It was important to "debunk," or break down, both the teachers' and students' preconceived assumptions about digital literacy tools. Teachers often assume that students experienced with digital skills in a social setting, like the use of FaceBook, Twitter, or texting, will transfer these same skills for academic learning, which is not the case (Sharpe, et al., 2010). At the same time, students assume that they "know everything about the technology," and therefore have a tendency to "tune out" during the teachers' instructions. This was definitely observable in the middle school settings used during the pilot study. Because of this, teachers need to develop and model explicit requirements and expectations as part of the introductory instructional time. (4) It is necessary to provide adequate time to teach the basics of the new tool, the unique expectations while learning in the online space, as well as the actual content for the task. While the use of the tool needs to remain transparent during the actual learning task, which focuses on the goals and objectives of the content material, teachers do need to plan extra instructional time when they introduce a new online application or tool to their students. For example, most older students are already familiar with instructional procedures that include reading from printed text or talking to each other in face-to-face learning situations. They do not need instruction on how to open the book or starting reading in the top, left-hand corner when using this familiar tool. Students have also learned basic conversation skills that do not need to be taught for face-to-face collaborations. Conversations that include critical thinking, however, are unique or unknown for many students—possibly in face-to-face discussions and definitely in academic online discussions. They need guidance to learn the basic features of the new application as well as learn how to "talk" to each other online for academic purposes.

These four guiding principles, gathered from the two previous iterations of my research projects as well as from my review of the literature, informed my thinking as I proceeded with the plans for this current study.

Transition from Formative Experiment to Case Study

As I started the intervention for this current study, I followed the framework of the formative experiment model that I designed, as explained throughout this chapter. It quickly became apparent, however, after collecting data from my first two sources — quantitative data from the pre-workshop survey and qualitative data from participant comments on the workshop wiki—that I would need to adjust the original objectives for the professional development course. Some of the teachers enrolled in the course did not seem to have adequate past technology experience or skills which would be required to complete an online collaborative project and try it with their students. While other teachers had adequate technology skills and previous experience, other factors prevented them from trying their projects with students during the timeframe of the research study. The details about these and other factors will be discussed in the last two chapters of this dissertation.

After the first two sessions of the intervention, I adjusted course completion expectations to meet the needs of the participating teachers and continued with the intervention. Again, my mixed methods research design did not change as I collected and analyzed data throughout the intervention. And, I continued the original intent of my study: I examined the effects of using interactive, collaborative online applications as a means of shifting teachers' pedagogical thinking and classroom practices as well as

increase their technology and skills as they sought ways to use new technologies to improve student critical reading and writing skills.

As I transitioned to the final research step of summarizing and explaining my findings emerging from the data, however, I discovered difficulty in clarifying my thoughts and my theories within the formative experiment model. I believe that part of this problem occurred because of the complexity of my original pedagogical goal – teaching the teachers rather than teaching their students—which added an additional level of challenge. I also speculate that part of the problem was inherent because I was unable to answer my first research question which focused on the formative experiment's pedagogical goal. While many of the participants integrated successful technology projects into their curriculum and tried them with their students, only one team actually designed a project with an online collaborative application and used it with their students. This team tried their project at the very end of the school year, well after I had completed the last of my follow-up interviews as the final data source.

At the advice of my dissertation chairs, I examined the possible transition to the framework of a case study. As part of this examination process, I created Figure 4.1 to clarify my thoughts about case studies and align my mixed methods design with the new framework, which appeared to fit well, both epistemologically and conceptually. So, for the next three chapters, I will frame the context of the study, my findings, and the resulting implications within the framework of a single, bounded case study (Merriam, 1998).

Summary of the Chapter

This chapter was added in order to explain the development of my original research framework under the formative experiment model. As part of this process, I explained my rationale for using a formative experiment. I also described the work of two previous iterations of my research which provided the guiding principles used for this study.

Eventually, I chose to transition to a case study framework, but kept my pedagogical goal as a focus and the four original research questions designed under the formative experiment model. My mixed research methodology also remained consistent throughout the study. This chapter was added to explain this transitional process for two reasons. First, I wanted to build an accurate, truthful narrative for the background of my research which took a unique, unexpected turn. I also wanted to guide other researchers who may be interested in my work to avoid some of the difficulties that I experienced.

CHAPTER FOUR: METHODS AND PROCEDURES

I conducted a mixed methods case study to examine the impact of introducing Web 2.0 applications to practicing teachers interested in updating and aligning their curriculum with new technologies as their schools piloted the Common Core State Standards (CCSS) and corresponding SMARTER Balanced (SBAC) assessments. The purpose of this study was to examine the effects of introducing and using these interactive, collaborative online applications as a means of increasing practicing teachers' technology knowledge and skills and as a way of shifting pedagogical thinking and classroom practices to accommodate effective student use of the Internet within content areas. The teachers who participated in this study were seeking ways to improve student critical reading and writing skills in preparation for the new multi-statewide assessments being created for the Common Core Standards.

An intervention, a professional development course for junior high teachers, formed the case for the study. The course was designed to increase teacher awareness of online tools for collaboration purposes, increase teachers' general technology knowledge and skills, and shift their pedagogical practices when using online applications for the purpose of student-to-student collaboration as a means of increasing critical reading, writing, and communication skills.

Research Questions

Five questions guided this study. The first four questions were constructed to guide the original formative experiment model and examine the impact of the professional development intervention. This intervention introduced practicing teachers to collaborative online applications as a way of increasing student critical reading and writing skills. The fifth question to the study was added as part of the case study framework, elaborating information emerging from the data about teachers-as-learners.

RQ 1. If teachers construct and implement units of study within their content area that use socially-constructed applications, will teachers be able to document positive student critical reading and writing growth in their classrooms?

RQ 2. What factors will enhance or inhibit the effective use of these online applications?

RQ 3. Will individual teacher participants perceive a significant growth in their technology knowledge or skills?

RQ 4. Are there changes in teachers' pedagogical practice in regards to using technology with students in the future? If so, what type of changes?

RQ 5. How do practicing teachers learn new online applications? What motivates teachers to learn new technologies?

Research Framework and Design

In this section, I will discuss my research framework and methodology, based upon a mixed methods design with complementarity intent. The methodology involved a parallel mixed methods design, collecting and analyzing both qualitative and quantitative

data simultaneously over the timeframe of the intervention (Creswell & Plano Clark, 2011). As discussed in Chapter Three, the framework for this research was originally created with a formative experiment model (Bradley & Reinking, 2011b; Reinking & Watkins, 2000). References to the original formative experiment have been included, as necessary, for clarity. However, in order to fully address the research question involving teachers-as-learners, I transitioned to a case study framework during the final writing process. This case study framework will be explained in this section as it aligns to the methodology.

Mixed Methods Intent

Of the five main purposes or rationales for conducting a study with mixed research (Greene, et al., 1989; Johnson & Onwuegbuzie, 2004), this study followed the complementarity intent, seeking "elaboration, enhancement, illustration, clarification of the results from one method with the results from the other method" (Greene, et al., 1989, p. 159). Greene and colleagues described complementarity intent distinctly separate from that of a triangulation intent—the more common mixed methods design model used to seek convergence of multiple data points. They described the complementarity intent as peeling back the layers of an onion. It is used to measure "overlapping but also different facets of a phenomenon, yielding an enriched, elaborated understanding of that phenomenon" (Greene, et al., 1989, p. 258). Thus, qualitative and quantitative data were collected simultaneously during three different data collection cycles throughout the study's intervention to assess different aspects, or layers, of the same phenomenon.

Case Study Framework

Merriam (1998) characterized a case study framework by three specific features: (1) particularistic features: the boundaries capsuling the specific case; (2) descriptive features: the complete, literal description of the incident; and (3) the heuristic features of case study: the empowering qualities that allow readers to discover or learn something for themselves while reading the details of the case. Each of these features of a case study framework contained aspects that aligned well with Greene and colleagues' (1989) description of complementarity intent. As a way of visualizing the connections between a case study framework, complementarity intent, and the mixed methods design used for this study, I constructed Figure 4.1. The first column represents the key features of Merriam's (1998) case study framework. The middle column demonstrates key features of mixed methods that align with case study (Creswell & Plano Clark, 2011; Greene, et al., 1989). The last column represents the design of this specific study. After each of the three specific features of case study, I also included possible advantages and limitations as connected to the case study framework and aspects of this specific study. Overall, this design provided good alignment and an appropriate fit with the study's purpose and intent.

Comparison of Research Framework and Design

Features of Case Study Framework (Merriam, 1998)	**Mixed Methods with Complementarity Intent** (Creswell & Plano Clark, 2011; Greene, et al., 1989)	**Methods Design for This Study**
Particularistic: focuses on a particular situation, event, program, or phenomenon bounded by time and space	Examines overlapping but different facets of a single phenomenon	Intervention: Three-month professional development course in new technology applications for junior high teachers
Advantage: Study may suggest key factors of what to do—or what not to do —in a similar		

situation.

Disadvantage: Limited generalizability to larger population.

Descriptive: includes as many variables as possible and describes their interaction	Provides enriched, elaborated understanding of a phenomenon	Data were collected from multiple sources over time: at the beginning, middle and after the intervention

Advantage: Illustrates and describes the complexities of the intervention and its context, especially searching for connections and compounding factors.

Disadvantage: May or may not be influenced by author's bias

Heuristic: illuminates understanding of the phenomenon, confirming or disconfirming previous research theories. Unknown relationships or connections between variables may emerge, both for the researcher and for the reader.	Both quantitative (measurable) and qualitative (descriptive) data are collected to confirm, disconfirm, or question hypotheses	Quantitative and qualitative data were collected simultaneously during three different data collection and analysis cycles

Advantage: Description of the case provides concrete view, resonating with reader's personal experiences and providing deeper, contextual understanding.

Disadvantage: Readers may jump to unwarranted conclusions or applications outside of the contexts for the study.

Figure 4.1. **Framework and design methods alignment. The four features of Merriam's (1998) case study framework are aligned with the mixed methods design developed for this study. Advantages and disadvantages of each feature are listed below each comparison.**

Participants and Setting

The participants in this study were junior high school administrators and teachers who taught seventh through ninth grade general education classes, special education classes, or students enrolled in Advancement via Individual Determination (AVID) programs for additional guidance and academic help. Participants came from three junior high schools all in the same urban school district in a northwestern state. Pseudonyms will be used throughout the study: Rocky Ridge, Central, and Hawk Bluff Junior High Schools in the Central City School District. Two of the schools involved in the study,

Rocky Ridge and Hawk Bluff, had high populations of English Language Learners (ELL) due to a large influx of refugee families; this directly affecting at least a third of the study's participants who worked with students who required help with reading, writing, or communicating in English. The same two schools had not met their Annual Yearly Progress (AYP) on the previous years' state assessments within these subcategories of students. General education teacher participants taught English language arts (ELA), reading, or social studies/world history. Teachers from the host school, Hawk Bluff, were all directly involved in professional learning community (PLC) interdisciplinary teams focusing to increase critical reading and writing skills through the use of AVID curriculum. See Table 4.1 for participant details. Pseudonyms were randomly assigned as an additional safeguard to protect participant identity.

Table 4.1
Participants in Study

Pseudonym	**Years of Experience**	**Degrees**
Alyssa Maddox	10 +	MA
Sharon Smith	10 +	MA
Kevyn Kerns	10 +	BA + 30
Robyn Samnang	10 +	MA
Amelia Tan	8 - 10	MA
Dale Derrick	10 +	MA
Aaren Jones	10 +	BA
Summer LeGuin	4 – 7	MA
Olivia Nessat	10 +	MA
Lauren Murray	10 +	MA
Linda Lowry	10 +	MA
Ted Graham, administrator	10 +	MA
Bruce Fish, administrator	4 - 7	BA

Selection of Participants and Schools

All participants voluntarily enrolled in the professional development workshop taught by the researcher. Participating teachers and administrators received one continuing education credit for successfully completing the workshop requirements, which included the completion of a project. Continuing education credits, also referred to as workshop credits or clock hours, are important for teachers and administrators to maintain their state certification which requires a completion of six credits every five years. Continuing credit was also previously connected to "highly-effective teacher status" and educators' movement across districts' pay scales, as part of the No Child Left Behind (NCLB) federal mandates.

Participants were recruited by a workshop flyer that was sent to building principals for distribution across the district [**Appendix A**]. Teachers from the host school were allowed first opportunities to enroll in the workshop; enrollment was then opened to other schools in the district. Initially 25 teachers and administrators signed a list showing their interest in the course. Fifteen attended the first night of the course in January 2013. Because the course was being offered for credit, it had to be taught during after-school hours, not during PLC time or during the regular teaching day, to meet the district's policy. Twelve educators—one of the participating administrators, two male teachers, and nine female teachers—enrolled in the course for one continuing education credit, completing the requirements over the three months to receive credit. Three educators—including one teacher, one other administrator and one district technology coach—did not enroll for credit but continued to attend various sessions throughout the course. All eleven teachers who are represented in the data took the course for credit.

During the first week of the course thirteen educators—two administrators and eleven classroom teachers—agreed to allow their information to be used in this research study, completing written consent forms as requested by the Institutional Review Board. Throughout this dissertation the eleven classroom teachers involved in the study are most often referred to as "teacher participants" or "participants" when just the teachers are being discussed. When data, findings, or discussions include information concerning the two participating administrators, I will specifically describe their role as connected to that particular finding or discussion.

Four of the teacher participants were from two other junior high schools in the Central City School District, referred to as Rocky Ridge and Central Junior High Schools. Summer and Lauren were from Rocky Ridge; Kevyn and Robyn were from Central Junior High. It is important to note Summer LeGuin's dualistic role. She had been one of the two participants in the pilot study one year prior to this study, as described in Chapter Three. Although Summer taught at a different junior high school, Amelia Tan was a close colleague due to their service on the district English language arts curriculum alignment committee. Summer and Amelia formed one of the teams during this current study. The other team for this study, Kevyn and Robyn, were both from Central Junior High. They did not know that the other one was attending the workshop until the first night, however, separately responding to the professional development flyer from their principal.

Significance of Context

The host school, Hawk Bluff, was chosen for this case study for several reasons. For one reason, it had developed interdisciplinary professional learning community teams

which targeted critical reading and writing skills across all grades and all subjects. For example, I observed AVID techniques for deeply reading a text (e.g., developing essential questions, circling key ideas, and taking notes following the Cornell Notes format) in math classes, art classes, history classes, and English language arts classes during the fall semester before the workshop started. Hawk Bluff was also a district pilot school for the Common Core State Standards and the related SMARTER Balanced (SBAC) assessments. English language arts teachers from the district had started aligning their curriculum with the Core Standards during the 2011 – 2012 school year and had started developing performance tasks to replace the district's End-of-Course assessments (EOCs) by 2013 – 2014. A portion of the SBAC assessments were piloted at Hawk Bluff during the spring of 2013. Two of the English language arts participants in this study were on this district curriculum committee. The social studies/history department at Hawk Bluff was also shifting to requirements of the Core Standards. For example, all social studies EOCs required essays written on topics or themes related to the history studied during each of the four grading periods. History teachers routinely discussed and guided students how to write age-appropriate essays (e.g., expository writing in seventh grade and persuasive writing in eighth grade) as part of their curriculum, developing expository themes or individual arguments, and then using facts from their studies to support their ideas.

Thus, the climate of the host school and the interest of the teachers participating in the study provided a method for purposive sampling. Purposive sampling, also called purposeful sampling, "is based on the assumption that the investigator wants to discover, understand, and gain insight and therefore must select a sample from which the most can

be learned" (Merriam, 1998, p. 61). In other words, for this study, I wanted to rule out certain known obstacles when introducing new professional development courses (e.g., teacher resistance to technology or lack of teacher interest in technology training) as well as to seek a targeted sample from which I could learn the most about instructing and guiding practicing teachers to adapt collaborative online applications for classroom use. These volunteers, the participating teachers at the host school and the four additional participants who had networked with the host school, were already focused upon the goal of shifting their classrooms for the Common Core Standards and SBAC assessments. They had an interest in technology and were seeking digital literacy strategies to improve critical reading and writing. They had already established a commitment to the new reading and writing standards in all subject areas, the shift in pedagogy to build deep reading strategies through AVID training, the advantages of learning in a collaborative professional climate, and the individual desire to learn how to integrate technology into their existing curriculum. The two administrators in the study, both from the host school, were also highly committed to these school-wide goals and focus.

Lens of the Embedded Researcher/Instructor

The practitioner-oriented focus encouraged by mixed methods researchers (Hanson, Creswell, Plano Clark, Petska, & Creswell, 2005; Onwuegbuzie & Teddlie, 2003; Teddlie & Tashakkori 2006) is also a necessary component for formative experiments (Brown, 1992; Bradley & Reinking, 2011b). Thus, my dual role as an embedded researcher and professional development instructor aligned well within this research framework and methods design. However, my awareness of possible limitations due to this dual role was kept at the forefront when designing data collection and analysis

procedures as a means to approach possible validity concerns. In this section I will describe my theoretical lens, pedagogical stance, and past experiences as a technology instructor.

Within specific mixed research designs, researchers suggest the use of an explicit theoretical lens, also described as a philosophical basis or paradigm, when seeking a "better understanding [of] a phenomenon that may be changing as a result of it being studied" (Hanson, et al., 2005, p. 229). In other words, as I designed this study, I had to keep in mind that I was an advocate for New Literacies and was promoting a socio-constructivist pedagogical approach within online learning environments. Because the teacher participants had volunteered to enroll in the technology course, I could assume that they also showed positive predispositions towards using new technologies, and many participants who knew me in my supervisory role for the university were also well aware of my advocacy stance.

Prior to starting my doctoral degree, I had taught in public school settings for 33 years in K-8 special education classes, K- 8 gifted/talented classes, and general education classrooms both as a second grade teacher and a middle school English teacher. I was an early pioneer of educational technology throughout all my teaching experiences, introducing my second graders to basic programming skills on Apple IIe computers in the late 1980s and becoming the first teacher in my school to have a laptop and modem for Internet access by the mid-1990s. By the turn of the twenty-first century, I was teaching basic web design and authoring our school's first website with the help of my students in third through eighth grade gifted/talented technology classes. In the 1990s I was hired by a local college to train and assess teachers for the state's required technology competency

assessments. I developed curriculum and instructed technology professional development courses for teachers throughout my district and surrounding districts. These varied experiences over the past three decade —guiding learners of all ages and abilities to learn about computers and computer applications—led me to this current research area.

During the fall semester prior to conducting the professional development course for this study, I was assigned to supervise pre-service teachers, who were either starting their professional year internships or completing their last semester as student teachers, at Hawk Bluff Junior High, the host school chosen for the study. This supervisory experience had both advantages and disadvantages in regard to the research project. It provided me with personal knowledge of the school's technology resources, connections with the PLC team leaders, and the capability of establishing trust and rapport with the building administrators and staff prior to the course. Three teachers who had mentored my interns or student teachers enrolled in the technology course. However, these prior acquaintances with the staff could have affected some of the participant responses during the workshop and follow-up interviews. For example, my familiarity with their classrooms or their students may have limited the amount of detail participants added during the interviews because they assumed that I had prior knowledge about a certain topic or issue. Some of the participants also had insider-knowledge of my advocacy for digital literacy and perceived me as a technology expert, which may have biased their answers; they might have said what they thought I wanted to hear. In addition, my familiarity with some of the participants could have influenced my analysis of the data. However, to overcome this type of potential researcher bias, I carefully monitored my embedded-researcher role by documenting my reflections and observations after each

workshop session, creating an online survey instrument which asked for information from an objective perspective, and planned semi-structured interview questions that would elicit candid opinions or thoughts from the participants. While planning for the study, the benefits of building collegiality and prior rapport with the teacher participants outweighed the potential for researcher bias.

The potential for bias was mitigated with a well-planned data collection process using multiple data sources which recorded participants' comments, progress, and reflections before, during, and after the professional development intervention. This data collection and analysis process, along with the development of survey instruments used during the study, will be discussed in the next section before I explain the details of the actual intervention.

Measures and Data Collection Procedures

Typology, Classification, and Rationale of Chosen Mixed Methods Design

Creswell, Plano Clark, Gutmann, and Hanson (2003) discuss typology for six different mixed methods research designs, and then recommend procedures for data collection, data analysis, and data integration based upon the mixed design chosen. Corresponding with the complementarity intent for this study—to seek elaboration, enhancement, illustration, and clarification of overlapping facets of one phenomenon (Greene, et al., 1989) —I chose a convergent parallel design (Creswell & Plano Clark, 2011) for this study. This design "analyzes both quantitative and qualitative data during the same phase of the research process then merges the two sets of results into an overall interpretation" (Creswell & Plano Clark, 2011, p. 77). In the convergent design for this

study (Figure 4.1), quantitative and qualitative data were collected simultaneously (represented by the + sign) and received equal priority status (Johnson & Onwuegbuzie, 2004). The process of collecting and analyzing data was repeated three times during three separate data cycles; the qualitative data were analyzed with qualitative methods and the quantitative data were analyzed with quantitative methods. Analyzed data were then merged into one or several data matrices or displays to complete each data collection cycle. Continuing Greene and colleagues' (1989) analogy of peeling back layers of an onion, I started by seeking an understanding of the phenomenon under study from the outside layers. Then, during each data collection and analysis cycle, additional layers were peeled back and examined for clarification, elaboration, or enhancement. In this way, as findings emerged from the data, each additional data source became a method to confirm or refute possible theories. Figure 4.2 is a visualization of this study's mixed methods design. Data sources are included in the boxes to the right of the figure.

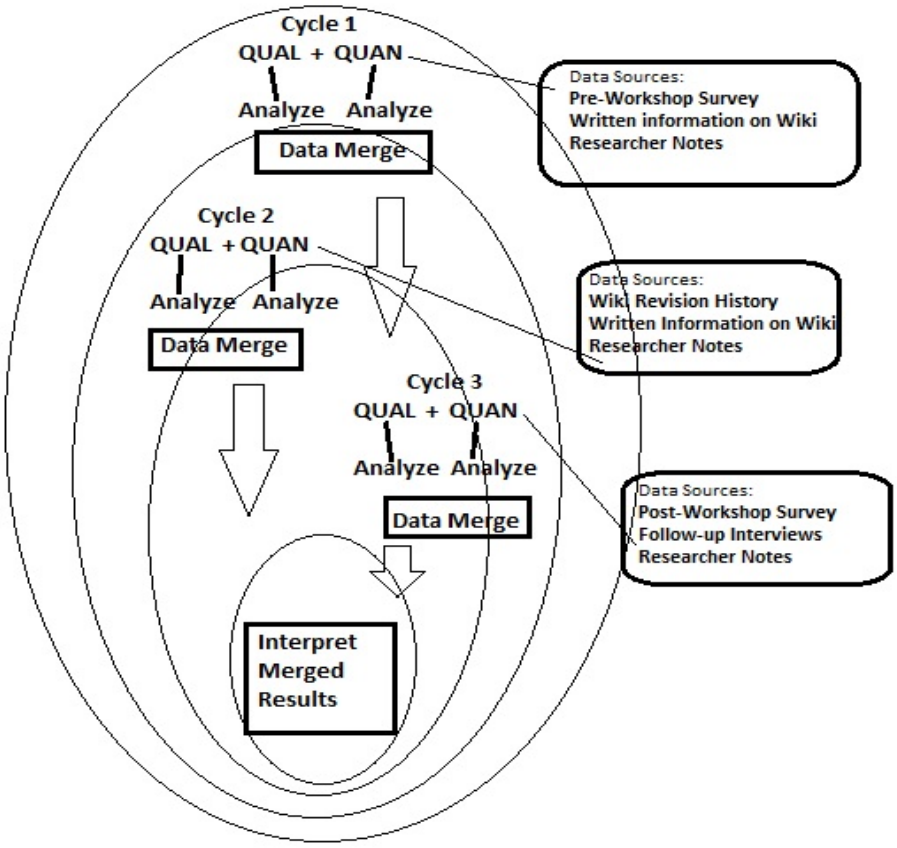


Figure 4.2. **Three cycles of study's convergent mixed methods design. The symbols QUAL + QUAN mean both types of data received equal weighting and were collected simultaneously. The ovals represent the overlapping layers of the complementarity design (Greene, et al., 1989). Data sources for each cycle are listed in the text boxes to the right of the diagram.**

The complexities of the phenomenon under study—the deictic nature of new literacies skills (Leu, Kinzer, et al., 2004), the interwoven elements of utilizing a professional development course with practicing teachers (DuFour, et al., 2005), and the magnitude of demands caused by the current shift to new standards (NGAC & CCSSO, 2010) —warranted the use of a multi-dimensional research design for this study (Johnson & Onwuegbuzie, 2004). As Greene and colleagues (1989) explained, a complementarity intent when utilizing multiple sources "increases the interpretability, meaningfulness, and

validity of constructs and inquiry results by both capitalizing on inherent method strengths and counteracting inherent biases in methods and other sources" (p. 259).

Construction of Survey Instruments

Difficulties were encountered when searching for pre-existing survey instruments for this study. I was unable to find a survey specifically designed for K-12 practicing teachers in regard to reporting digital literacy instructional practices and technology skills. In addition, I could not locate professional development instructional tools or strategies specifically connected to the Common Core Standards and new literacies instruction for educators. For these reasons, I specifically designed three instruments for this study: (1) *All the Right Stuff*, a pre-/post- workshop online survey, (2) CCSS Alignment Activity, and (3) Measures of Student Proficiency. All three tools were designed as professional development instructional activities, but also had potential as research instruments for data collection.

Pre-/Post-Workshop Survey. The online survey, *All the Right Stuff* (Appendix B), was used as a pre-/post- workshop survey for data collection. It was also used for instructional purposes, which will be explained in a later section as part of the discussion about the intervention. I developed the items for this survey with information from previous research studies (Lee & Young, 2011; Nadelson, et al., 2011), from previous professional development curriculum that I had constructed and taught, and from information gathered from the prior pilot study (McCulley, 2012). My doctoral committee first examined a print version of the survey during the beginning stages of the research design process. After completing their editing recommendations, I created a revised online version in Google Drive which was sent to three doctoral colleagues and

four colleagues who were K-12 educators for further input. The final version of the survey utilized a simplified rating scale and clarified terminology by adding examples of specific applications. The last section was also shortened in an attempt to avoid participant fatigue.

The pre-workshop version of the survey contained four sections: (1) basic information about teaching experience, current classroom assignment, and educational background; (2) a five-point rating scale of technology knowledge; (3) a five-point rating scale of technology experience and skills; and, (4) a short section with closed, multiple choice answers in regard to a variety of instructional and learning preferences. Spaces for open-ended comments were provided throughout the survey to allow participants opportunity to explain their responses. For the post-workshop version of the survey, *All the Right Stuff, Revisited,* the first section was shortened but contained an item for participant initials so that pre- and post- survey data could be aligned. The second and third sections remained the same to ensure a measure of reliability between pre- and post-gains. The fourth section of the post-workshop survey asked questions about the future use of technology in participants' classrooms. The final survey items used in data analysis are represented in Figure 4.3.

Seventeen Survey Items from *All the Right Stuff*	
Section and Rating Scale	**Survey Item**
Technology Knowledge Scale: 0 = No knowledge. I have very little interest or no need. 1 = No knowledge. However, I've heard of this and I'm interested.	#1: Using Learning Management Systems (e.g., SchoolFusion)
	#2: Taking digital notes while reading digital texts (e.g., OneNote, Evernote)
	#3: Using hardware and/or digital tools for instructional purposes

2 = Limited Knowledge Level. I've explored this once or twice, but I don't have enough knowledge to work on my own. 3 = Adequate Knowledge Level. I have a proficient level of knowledge. I just need more time and more practice. 4 = Strong Knowledge Level. I can explain or teach this to colleagues and to my students.	#4: Using online interactive websites for instructional purposes
	#5: Designing, editing, and managing websites
	#6: Creating and managing blogs
	#7: Using online storage systems (e.g., LiveBinders, DrobBox)
	#8: Using online collaboration with students
	#9: Creating digital projects or presentations that can be viewed on the Internet
Technology Experience and Skills Scale: 0 = No experience and not interested. 1 = No experience but interested in learning more. 2 = Limited experience. (I've used this rarely - maybe three times during the last 2 years- either with students or for professional purposes) 3 = Adequate experience. (I use this occasionally -maybe once or twice a semester - either with students or for professional purposes) 4 = Experienced. (I use this regularly - once or twice a week - either with students or for professional purposes)	*Experiences with online devices and applications such as:*
	#1: Google Docs (now called Google Drive)
	#2: Mobile Devices (examples: iPads, iPods, Smart Phones, tablets)
	#3: Wikis (examples: Google Sites, WikiSpaces, PBWiki)
	#4: Blogs (examples: EduBlog, KidsBlog)
	#6: Cloud Storage for files and links (examples: DropBox, LiveBinders, Diigo, Delicious, Mendeley, EverNote)
	#7: E-readers, e-zines, or e-books
	#8: Using apps or sites that incorporate multimedia or hypertext (examples: Dipity, Prezi, Animoto, StoryBird)
	#9: Online databases (examples: LiLI, ERIC, other e-libraries)

Figure 4.3. **Items from the pre/post survey. The seventeen survey items used for pre/post statistical analysis are listed in the right-hand column. For more details about the survey, *All the Right Stuff*, see Appendices B and C.**

Before the quantitative analysis of data from the pre-/post- workshop surveys, I conducted a post hoc reliability test using the IBM Statistical Product and Service Solutions (SPSS) computer statistical software program. The seventeen survey items in Figure 4.3 generated a Cronbach's Alpha of .925, above the reliability cutoff score of .70, thus determining the scalability of the items used in the pre-/post-workshop survey results. These items were combined to measure participant gains, discussed in the next chapter. Also in the next chapter, I will discuss qualitative findings from the various

sections of the *All the Right Stuff* survey. See more discussion about the post hoc reliability measures in Appendix C.

Core Standards Alignment Activity. The Common Core Standards (CCSS) alignment activity, which I created for the professional development course, had two parts (see Appendix D). The first part was designed as a way for teachers to take a deeper look at the new standards across the grade levels in regard to integrating technology skills throughout the curriculum. The second part encouraged teachers to summarize their reflections about their curriculum and their students and make goals to readjust their instruction to align with the new standards.

I had designed this instructional tool from my personal research of the CCSS Initiative Handbook (NGAC & CCSSO, 2012) relating to anchor standards that explicitly integrated technology throughout the grade levels, Kindergarten through Twelfth Grade (or Career and College Readiness—CCR). During the tool development process, several professional colleagues, including my doctoral advisor and committee, reviewed this tool and provided feedback.

Measures of Student Proficiency Tool. I designed one other instructional tool and potential data source, a Measures of Student Proficiency Tool (Appendix E). The intent of this tool was to provide participating teachers a method of collecting personal classroom data from their students in order to demonstrate alignment with their instructional goals and to measure student growth. This research instrument and instructional tool, designed and vetted in the same fashion as the CCSS activity, above, was intended to gather information regarding RQ #1: if teachers were able to measure student reading and writing gains after using a collaborative online application with their

students. This instrument was not used during the study. Reasons will be discussed in the next chapter.

Data Collection Process

Data gathered for analysis in this study were collected from thirteen educators—eleven junior high teachers and two administrators—who voluntarily consented to participate in the research project for this study, in compliance with documentation submitted to and approved by the Institutional Research Board. There was no distinction made between the thirteen research participants and the three non-research participants during the professional development course.

Data collection procedures followed the suggested format of a convergent parallel design (Creswell & Plano Clark, 2011). I started data collection the first week of the course and then organized it in a similar fashion for two additional cycles, collecting qualitative and quantitative data simultaneously before, during, and after the professional development course.

Data sources for this study included (1) *All the Right Stuff*—a self-reporting online survey (Appendix B), (2) the first part of the CCSS alignment activity, (3) participant comments and reflections written on the workshop wiki, (4) teacher-to-instructor email communications (not all participants could use the wiki effectively or proficiently at the beginning of the course), (5) quantitative data gathered from the workshop wiki's revision history including number of participant revisions and number of participant-to-participant conversations, (6) researcher notes and reflections, (7) *All the Right Stuff Revisited*—a post-course online survey, and (8) individual follow-up interviews. See Figure 4.4 for the sequencing of data source collection.

Data Collection Time Line				
Collection Cycle	**Data Source**	**Purpose**	**Type of Data and Research Questions Answered**	**Development of Instrument**
Cycle 1 1/28/2013	#1: *All the Right Stuff* Online self-rating survey of technology skills, knowledge, and instructional preferences	• Instructional tool used to differentiate instruction during the workshop and guide participant's selection of appropriate projects • Survey instrument for both quantitative and qualitative data, used in first and third cycles	Quantitative and Qualitative Data RQ #1 RQ #2 RQ #3	• Online Google Form created in Google Drive • Close-ended survey with comment boxes provided for additional explanations Sample in Appendix B.
Cycle 1 1/28 – 1/30	#2: CCSS Alignment Activity	• Participants compared CCSS anchor standards to current curriculum and student levels	Qualitative Data RQ #1 RQ #4	Sample in Appendix D
Cycle 1 1/28 – 2/9 **Cycle 2** 2/10-3/16	#3: Participants' Written Reflections and online collaboration practice	• Teachers were encouraged (not required) to keep written reflections about their progress on workshop wiki. • Teachers used workshop wiki as a practice site • Workshop wiki was coded and analyzed from screen captures collected in OneNote	Qualitative data RQ #1 - #5. Specifically, RQ #5	Closed (private) Wiki developed in Google Sites exclusively for the PD workshop
Cycle 1 1/28 – 2/9 **Cycle 2** 2/10-3/16	#4: Other written communications	• Participant-to-instructor communication • Documents attached to emails	Qualitative data RQ #1 - #5. Specifically, RQ #5	Accepted and collected the same as data Source #2
Cycle 1 1/28 – 2/9 **Cycle 2** 2/10-3/16	#5: Wiki revision history	• Counted number of collaborative conversations, number of revisions, and number of new content pages created during each data cycle	Quantitative data RQ #1 - #5. Specifically, RQ #5	Quantitative data methods modeled from Lee & Young study (2011)
Cycles 1 - 3	#6: Researcher written notes and reflections	Written reflections and notes were completed after every workshop session.	Qualitative Data RQ #1 - #5.	Important to validate data from different perspective
Cycle 3	#7: *All the Right Stuff, Revisited*	• Not used during PD course	Quantitative and	• Online, self-rating survey.

3/16/2013	Post-workshop online survey	• Used only as data source	Qualitative Data RQ #1 - #5. Specifically, RQ #4	• Same close-ended questions as Pre-workshop survey • Added 2 questions about future use of technology
Cycle 3 April – May, 2013	#8: Follow-up Interviews	Asked semi-structured questions derived from first 2 cycles of data collection and research questions	Qualitative data RQ #1 - #5.	• Audio-recorded, open-ended conversations

Figure 4.4. **Data collection time line. The data sources are listed in chronological order or by data cycles.**

Relationship of Measures to Research Questions

Data were collected from multiple quantitative and qualitative data sources before, during, and after the professional development intervention. In this section I will describe the data sources used for the study and how they are related to specific research questions. Refer to Figure 4.4 for a data collection time line as an overview of all data sources.

1. Technology Self-Rating Survey. All participants completed this self-assessment tool, entitled *All the Right Stuff*, at the beginning of the first night's session. See [Appendix B] for the introductory information and a complete list of survey items. This survey served three purposes: 1) it collected pre-intervention data from each participant for research purposes; 2) it provided formative feedback for myself as instructor concerning the technology skills, knowledge, instructional preferences, and interests of the teachers taking the workshop; and 3) it guided the participants as they evaluated various online applications to use for their workshop projects. By rating their technology skill levels, past technology experiences, and instructional preferences when using technology, I envisioned that participants would gain a deeper understanding about

their current practices and how specific online applications might fit into their classrooms.

This data source collected information used in part to answer: Research Question #1: Will teachers be able to document positive student critical reading and writing growth? Research Question #2: What factors enhance or inhibit the effective use of the technology? Research Question #3: Will participants perceive a significant growth in either their technology knowledge or skills?

2. CCSS Alignment Activity. This activity guided the teachers as they compared their curriculum and current student skill levels to four different CCSS anchor standards that specifically connected to literacy and technology skills. Teachers discussed which of the anchor standards they were currently addressing within their instruction, at which levels their students were performing, and what changes they wanted to make in their current curriculum to integrate the use of the Internet, digital reading skills, and online collaborative writing skills in alignment to the standards. Qualitative data collected from the first part of the activity provided information for RQ #1: Will teachers be able to document positive student critical reading and writing growth? And RQ #4: Are there changes in teachers' pedagogical practice in regards to using technology with students in the future? If so, what type of changes?

3. Participants' Written Reflections and Comments on Wiki. Teacher participants were encouraged to freely experiment, practice, and communicate with each other and the instructor in the private learning environment afforded by the closed workshop wiki that I created with Google Sites. Participating teachers created their own pages and subpages on the workshop wiki where they were encouraged to keep an online reflective journal

and respond to one another during the three-month workshop. The ideas and guidelines generated during the workshop activity were designed to encourage the use of similar spaces with the participating teachers' own students. In addition to the reflective journal, teachers were encouraged to structure an online space as part of their planning process for their workshop projects.

The workshop wiki provided an online learning environment and model for the teacher participants. It also allowed me an effective method to separate my dual role of instructor and researcher. I could focus upon the needs of the teacher learners during face-to-face instructional time and not think about collecting data for the research. Data that I wanted to collect and analyze for research purposes were being generated and stored within the online application. This became a great benefit; I was able to stay focused on my instructor role when working directly with the teacher participants.

All versions of the digital text written on the workshop wiki, whether deleted, edited, or maintained in its original form, remained available during and after the data collection cycles. Wiki applications conveniently store all edits, along with author and date, in the revision history. I created screen captures from the wiki and the wiki's revision history during the first two data collection cycles, storing the screen captures in tables on OneNote pages in preparation for data analysis. Qualitative data from this source (e.g., all comments, images, hypertext, or reflections) had the potential of answering any of the five research questions, but specifically addressed RQ #5: How do practicing teachers learn new online applications? What motivates teachers to learn new technologies?

4. Other Teacher-to-Instructor Communications. All digital conversations initiated by the participants were also collected. Not all participants readily adapted to the collaborative discussion forums designed within the workshop wiki; some participants relied on email to ask me questions or send documents. In addition, participants used email to send personal questions or comments pertaining to specific frustrations or confusions. These additional written texts, equally important for an overall view of the teachers' learning process, received the same weight as questions or conversations written on the workshop wiki. They were collected and added in chronological order to the OneNote tables described above. Data from this source complemented the data from other participant comments and reflections from the workshop wiki, having the potential to answer any of the five research questions.

5. Wiki Revision History Data. Participant reflection journals and other written texts provided a rich source of qualitative data. In addition, the wiki revision history provided another source for quantitative data. As modeled in a study by Lee and Young (2011), I collected quantitative data from various parts of the wiki revision history: the number of pages created by each participant, the number of revisions per page, when revisions took place (i.e., during the workshop sessions or during out-of-class practice times) and the number of different participants who contributed original text or edits to existing text in a collaborative effort. This quantitative data provided additional insight of the same phenomenon from a different viewpoint, either corroborating, refuting, or uncovering some new "unique variance" within the data as recommended within a mixed methods design (Hansen, et al., 2005, p. 225). Data from this source had the potential of

answering any of the five research questions, but specifically addressed RQ#5: How and why do practicing teachers learn new online applications?

6. Researcher Comments, notes, and Reflections. Tysseling and I (Tysseling & McCulley, 2012) developed a method of organizing the screen captures from wikis within OneNote, an MS Office tool, allowing the researcher capabilities to annotate and analyze digital data. I used this same method to code and analyze written online data from the participants. In the same manner face-to-face instructors guide their students, a wiki affords opportunities for online instructors to model, guide, and make comments within a participant's work (Tysseling & McCulley, 2012).

These in-class instructor comments written on the wiki, along with notes and reflections written immediately after each session, became another viewpoint for qualitative data analysis used during the first two data collection cycles. Data from this source had the potential of answering any of the five research questions.

7. All the Right Stuff, Revisited. Participants completed the online post-workshop survey either the last night of class or within the next two weeks. I added a new section to this survey, entitled Future Preferences, as an additional source of data to possibly answer Research Question #4: Are there changes in teachers' pedagogical practice in regards to using technology with students in the future? If so, what type of changes? See Appendix B for the list of questions used in this additional section. Data collected from this section of the online survey were compared to data collected during the follow-up interviews.

8. Follow-up Interviews. During the last week of April and the first weeks of May, I met either individually or with teacher teams for follow-up interviews. These

were audio recorded, transcribed, and analyzed during the third data cycle. I wrote semi-structured questions before the interviews, focused upon the research questions for the study. The semi-structured questions allowed me opportunity to collect similar data across the individual interviews, when possible, but I also planned time during each interview for open-ended conversations about the teacher participants' process of completing their projects and how they felt their students reacted to the technology if it was implemented in the classroom. Data from this source had the potential to answer any of the five research questions.

Data collection took place before, during, and after the intervention. Before discussing the data analysis, consolidation, and legitimization processes, I will first describe the intervention used for the study in the next section.

The Intervention for the Study

The intervention, a three-month professional development course offered for continuing teacher credit, became the boundaries for this case (Merriam, 1998). The intervention started January 28, 2013 and ended the week before Central City School District's spring break, March 16, 2013. Teachers taking the course for credit were graded with a pass/fail rubric system (Appendices A and F).

I purposefully used the term *workshop* to describe the course throughout the intervention and the study mainly because of my instructional style. Over the years I have found that a flexible, open-ended learning environment has worked best for adult learners when working with new technologies. Through trial and error experiences over three decades of professional development with teachers learning computer skills, I have discovered that is important to provide a semi-structured instructional time at the

beginning of the course to discuss key concepts. However, it is equally important to provide ample time to allow the participating teachers to explore and ask questions in an informal, relaxed atmosphere. Thus the term *workshop,* which connotes my preferred open, informal learning atmosphere, is seen throughout this study and the data.

The Workshop Wiki

I created a wiki website using Google Sites specifically for the study's main instructional and online learning environment. This choice was made due to past research projects (Tysseling & McCulley, 2012) and the pilot study which was conducted prior to this current study (McCulley, 2012). I had also been using a similar webpage design while teaching literacy courses with pre-service teachers. I had found it to be successful due to student familiarity with Google products and its intuitive structure: the navigation worked the same as a typical website. See Figure 4.5 as an example of the workshop wiki homepage.

The one image of hands holding the world remained constant throughout the course, used as a reference point to find the homepage. This image also modeled how to give credit to outside sources. I changed the hypertext on the top, left-hand side of the home page on a weekly basis with updated information and new links. The rest of the homepage was created with Google gadgets that I changed on a regular basis, including a section for class announcements and a section that included links to new applications or professional articles connected to material from the workshop content. (A Google gadget is the name given to Google's tools that allow dynamic web content to be embedded on a web page.) The sidebar navigation remained the same throughout the workshop; I added hyperlinks as new material was added to the site.

Figure 4.5. **Workshop wiki homepage.**

I had created a section of the website, labeled *Discussion Space,* which provided step-by-step directions for creating individual subpages. I had already pre-built a table of contents for the subpages, visible on the parent page of the section, so that when teachers created their personal reflection pages correctly, their names automatically appeared in the table. This became one of the first activities during the first night's session. During the first week's sessions participants discussed ideas about using online journals for academic purposes and possible ways to communicate within the online learning space.

The bottom portion of the workshop wiki contained the agendas for each face-to-face session. Edited a few days before each session, these agendas helped to inform participants of upcoming activities as well as serve as guidelines during the instructional sessions. Screen captures of the agendas (Figure 4.6) will be used to clarify the key features of the intervention, discussed below.

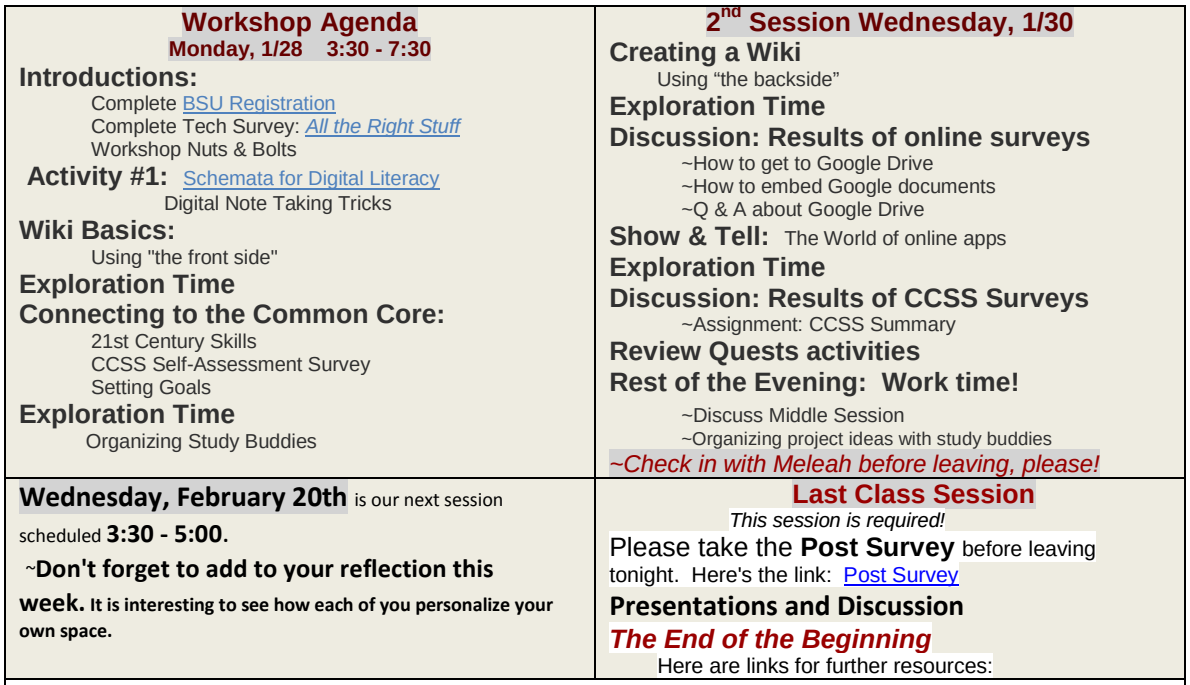


Figure 4.6. **Agendas for face-to-face sessions during intervention**

Organization of Instructional Time

I met with teacher participants for eight hours of face-to-face instructional time over two night sessions during the first week of the workshop. During this first week, I introduced online editing and wiki basics, we discussed the theories behind using online collaboration for critical thinking, and I conducted the CCSS alignment activity. As time permitted, other online applications beyond the wiki were introduced and discussed. By the last hour of these first two workshop sessions, most participants could independently manage the basics of the workshop wiki: how to switch the application to the online web editor, create additional pages, write their journal reflection entries, and use a table of contents to organize their text and images. During the next few weeks participants were encouraged to independently explore the workshop wiki space, explore a different online

application of their choice, read further about new literacies skills, narrow down their ideas for an online project, and write reflections in their online journal spaces.

After three to four weeks of individual or team exploration, I offered a variety of opportunities for additional face-to-face instruction. These are called the middle sessions of the course throughout the data collection and analysis. If teachers or administrators were taking the course for credit, they were required to attend at least one of the four-hour middle sessions to meet the minimum credit-hour instructional time. During the middle sessions, instruction focused upon individualized needs of the teacher participants.

The two participating administrators and the district professional development coach often stepped in to work with participants on an individual basis when a question was within their area of technology expertise. This was not planned, but welcomed both by the participants and by me. The administrators provided additional support and coaching, so I was able to differentiate my instruction even more to meet the needs of the individual teachers. Many spontaneous small-group discussions took place during these two middle sessions, often initiated by the instructor, as specific topics of interest arose or unique problems concerning specific applications were encountered by participants. As an example, at least an hour of one session was used as a small-group discussion time focused upon new literacies online reading comprehension strategies (Coiro, 2003; Leu, Kinzer, et al., 2004).

I did meet face-to-face with a few individuals or teams of participants during the middle months of the course, either during teacher preparation time or after school, if invited by individual participants. However, the most common forms of communication

during the middle months of the course were mostly through email or through the workshop wiki site. Per suggested guidelines formulated during past research work with wikis (Tysseling & McCulley, 2012), I added instructor comments throughout the participants' reflections as an additional way of modeling online instructional guidance, using different colors and styles of fonts and adding dates and initials. These instructor comments were also collected as part of the data collection process. Figure 4.7 is a screen capture from one participant's reflection page depicting a typical instructor comment. Some participants did respond to each other's reflections throughout the workshop wiki, and some participants did respond back to my comments. Responding to other colleagues or the instructor was not a requirement for the course, and data were not kept on the amount of participant-to-participant collaborative responses. Keeping a reflection journal was highly encouraged, and points were awarded for weekly journal entries.

The last face-to-face session for the course, held in the middle of March, was designed as a time of celebration and reflection. Individual teachers or teams presented the online projects they had created for the course while colleagues asked questions or commented about the applications used. Between participant presentations, I led whole-group discussions concerning things discovered about various applications or questions they still wanted answered. This last session was not video recorded, but I wrote

#3 February 4, 2013

I have decided to build my own Wiki. I started looking at the Wiki space demonstration cite and have got a page started. There is nothing on it as of right now. I am planning what I want to do. I know I need to start out slow and easy and then build up from ther.

Linda, thanks for sharing your plans. You've got good ideas and a great attitude. You're right-- it just takes lots of experimenting and figuring things out. I'm looking forward to seeing your progress! [Meleah 2.10.13]

Figure 4.7. **Participant wiki reflection page.**

personal observational notes during the presentations. I also gave each presenter written feedback about his or her project. After presentations were completed, I ended the workshop with a review of important links on the workshop wiki that would remain available for future references. The workshop wiki remained as a closed environment, not open to public viewing, so that the teacher participants could continue to explore aspects of the wiki on a personal basis and for the needs of my research study.

Course Content Organization with Quests

I developed one section of the workshop wiki as a means of organizing the content for the course. This section also provided a model for the teachers when developing their own online learning spaces. I labeled this section *Workshop Quests*, borrowing a term from a game-based instructional design (Haskell, 2012). My intention was to introduce the teachers to another way of thinking about utilizing online learning spaces.

The Workshop Quest page provided a menu of activities from which participants could choose: 1) Knowledge Quests—activities concerning new literacies instruction and

other information about online applications; 2) Experience Quests—specific "how to" directions for building a wiki for academic purposes; and 3) Classroom Connection Quests —steps for completing their online project for their students. See Appendix F for screen captures from the quest activities menu webpage along with a description of the point system used for the course. Connected with the idea of the quests, participants could choose which differentiated path they wanted to follow (Beginning, Intermediate, or Advanced) and which quests they completed in order to gain the suggested 1000-point total to compete the course for credit. This instructional format added a level of flexibility during the intervention. After the first week of the course, I added new knowledge quests and experience quests on a weekly basis based upon participant feedback, questions, or concerns. I added direct links to the new quests in the weekly updates on the workshop wiki homepage.

Instruction with Google Drive

The pre-workshop survey, *All the Right Stuff* (Appendix B), designed as a data collection source, was also used for instructional purposes. Participants took the online survey during the first hour of the first night's session (See course agenda, Figure 4.6). During the second night's session, I demonstrated how Google Drive generated the results of the survey, taken by participants the night before, in both a spreadsheet format and graphic displays. After this simple demonstration some of the participants expressed an interest in using Google Drive and started asking a barrage of questions, wanting to stop and explore this application further on their own.

This instructional time with Google Drive demonstrated the vast diversity of skills, needs, and interests of the teaching participants during the first week of the

intervention. Some participants were well-versed with Google document features stored on the Internet, while others had never experienced any document stored online. Within my formative experiment framework, I documented this diversity and adapted the workshop to meet individual participant learning goals. Instruction was shifted to include even more hands-on time with specific online applications and away from whole-group instruction or discussion. For example, I worked with individuals or teams on basic web design skills (e.g., the difference between internal/external links, the hierarchical structure of main pages and subpages, or why hypertext does not behave the same as text in a word processor). I also guided a smaller group of teachers with beginning technology skills though the collaborative features of the different Google applications available in Google Drive.

Instruction with the CCSS Alignment Activity

This activity guided the teachers as they compared their curriculum and current student skill levels to four different CCSS anchor standards that specifically connected to literacy and technology skills (Appendix D). Teachers examined four anchor standards in connection with how the standards were currently being addressed within their instruction, at which levels their students were performing, and what changes they wanted to make in their current curriculum to integrate the use of the Internet, digital reading skills, and online collaborative writing skills in alignment to the standards.

Teacher participants completed the first part of this alignment activity individually during the first session (Figure 4.6; Appendix D). For the initial activity, teachers were not provided with the actual grade levels for each of the anchor strands. As they read the standards, teachers marked which areas they were currently including in

their curriculum and at what levels their students were performing without knowing the actual grade levels. Then, during the second session, they were given a copy of their original survey along with a version that listed the same four anchor standards with the grade levels. I discussed the general results of the survey from my perspective with the teacher participants and administrators in a brief whole-group discussion during the second session.

The intention of this activity was to guide the teachers as they set their personal technology and literacy learning goals based upon the perceived weaknesses and strengths of existing content curriculum and student needs. For example, Anchor Writing Standard #6 requires that fourth graders can "produce, and publish writing as well as interact and collaborate with others" on the Internet as well as through printed text and that fourth graders have "keyboarding skills sufficient to type one page in a single setting" (NGAC & CCSSO (2010) p. 21). If the junior high school teachers marked this as an area of weakness in their curriculum or as an area that their students had not achieved, they would need to find ways to bridge this gap between fourth grade and eighth grade expectations as they aligned their instruction with the CCSS standards and assessments. For a culminating activity, teacher participants were asked to complete a summary of the alignment activity (Appendix D) and attach a copy of their summary to their workshop wiki page or send to me via email. This summary was encouraged, but not required; participants received points for their summaries as part of the quest activities.

Summary of Intervention

The intervention, a three-month professional development course, formed the bounded case for this research study. It was designed as part of a formative experiment model to increase teacher's use of online collaborative applications as mechanisms to build student critical reading and writing skills. I examined the implementation of this new professional development course with a group of eleven interested, motivated teacher participants. The online learning environment on a closed wiki was created with the intention of (1) guiding teachers as they learned to navigate the interactive space and (2) providing a model for online instructional ideas. I designed and developed the activities for this intervention so that data could be collected, measured, and explored in broader contexts for future research.

Data Analysis and Data Consolidation

The metaphor of an onion being peeled back layer by layer (Greene, et al., 1989) guided my beginning thought processes as I designed a plan for data analysis. Thus, the convergent parallel mixed methods design presented itself as overlapping concentric layers; as I completed each cycle of data analyses, I arrived closer and closer to the center (Figure 4.2).

Data were collected and analyzed in three cycles. During each cycle qualitative and quantitative data sources were collected concurrently and received equal weighting. The data analysis process was started after the first night of the workshop and continued throughout the project, a method supported by both case studies research (Merriam, 1998) and the formative experiment research model (Bradley & Reinking, 2011b; Reinking & Watkins, 2000). Quantitative data were first analyzed with descriptive

statistics during the first two cycles; then during the third cycle, tests of statistical significance were conducted. Qualitative data were analyzed with a constant comparative method (Glaser & Straus, 1967; Merriam, 1998), described in more detail below.

After each cycle, data were reduced, or merged, through the use of various data displays (Bogdan & Biklen, 2007), mostly data matrices (Creswell & Plano Clark, 2011), as a way of answering specific research questions or exploring possible themes emerging from the qualitative data. After the final cycle of data was collected and analyzed, all data sources were again used in a final consolidation process to distill and refine the themes merging from the data.

Quantitative Analysis

Cycle One. I conducted an initial analysis of quantitative data for Cycle One after the first night of the professional development course, using data from the pre-workshop (*All the Right Stuff*) survey [Appendix B]. The Google Drive application automatically captured survey results in both a spreadsheet format as well as a summative format, results for each survey item represented by bar graphs or pie charts. Utilizing this first sweep of numbers and percentages without connecting to individual participants and their personalities helped me start data analysis from an objective perspective.

Cycle Two. For the second data collection and analysis cycle, I first organized revision histories modeled after a study by Lee and Young (2011). Each time a participant created a webpage or made a revision, the information was automatically archived in the wiki's Revision History, listed by the participant's name, date, and time the revision was saved. Using this wiki component, I created a revision history document for each participant, listing all pages created by each participant, all edits made by each

participant, and when the various online texts were created. From this information I was able to compile data such as (1) the total number of revisions made during workshop sessions versus the number of revisions made outside of instructional sessions, (2) the number of participants who routinely visited the workshop wiki and wrote in their reflective journals, or (3) the number of collaborative conversations and length of conversations that were initiated and continued between participants.

Cycle Three. I analyzed pre- and post-workshop survey data to measure if an overall significant gain in technology knowledge or skills was perceived by the teacher participants. Two sections of the survey remained the same between the pre- and post-editions, which were used for this analysis: (1) Technology Knowledge and (2) Technology Skills and Experience. Ten teacher participants completed the pre-workshop online, self-rating survey at the beginning of the first workshop session, and then completed a similar post-workshop survey within a week of the last workshop session. There was an eleventh teacher participant who is not reflected in this data; the participant took both of the surveys but did not remember to press the submit button after completion of the post-survey.

I conducted a paired sample (within-subjects) t-test to measure overall gains between total scores of the pre- and post-workshop survey. I also analyzed the growth of individual participants. See Table 5.1 for an overview of the results.

Qualitative Analysis

Cycle One: 1/28/2013 – 2/9/2013. For qualitative analysis, I started writing researcher memos and notes after the first night's workshop session as an additional perspective and data source. I continued writing notes, questions, observations, and

thoughts throughout the intervention. These notes were used throughout the qualitative data analysis process as part of the constant comparative method. When mentioned, these notes are labeled as Researcher Notes and dated.

Other qualitative data for Cycle One were comprised of teacher participant written comments to each other as well as to the instructor as they negotiated the online collaborative Google Sites application (the workshop wiki) during the first sessions and first month of the training. I also collected participant emails for additional data, as not all participants were equally comfortable writing in the wiki environment especially at the beginning of the workshop. I collected either digital texts or screen captures, stored them in Microsoft OneNote, and sorted them in chronological order by date of entry. All names were removed and replaced by a capital letter and xxxxx (i.e.: Yyyyy or Cccccc) so that a conversation could be followed between participants. As an example, Figure 4.8 is a conversation between participants that was captured at the bottom of one participant's page in the section available for comments.

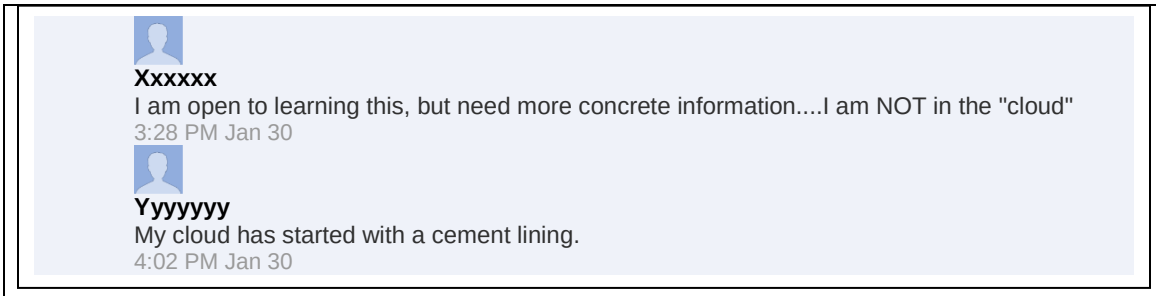


Figure 4.8. **Screen capture of participant comments from bottom of wiki page.** Participants used the comment feature at the bottom of the wiki page for instant messaging during class time.

After data were collected from the workshop wiki, I copied and pasted the digital texts and screen captures in chronological order into a single table in a Microsoft Word

document to begin the coding process. One column held the raw data. The second column was used for descriptive information from the website (e.g., (1) entry was written during a workshop session or on participant's own time, (2) entry was written as part of a participant's reflective journal or other location within the wiki, or (3) entry was written to instructor as an email). The last column was used for comments, questions, and the key words or phrases that became part of the initial coding process.

I read through the data, stopping and typing comments or questions in the last column beside each piece of data and recording certain words, phrases, or topics that began to emerge from the data. Constantly comparing one incident in the data with another (Glaser & Strauss, 1967), I searched for regularities and patterns as well as topics covered in the data (Bogdan & Biklen, 2007). Eventually these comparisons led to tentative categories which were explored further during Cycle Two.

A colleague from the literacy department, skilled in the qualitative coding process but unfamiliar with wikis or the participants, conducted an external audit for inter-rater reliability for this first data cycle. A percentage check (total number of correctly matched codings divided by total number of codings completed by colleague) demonstrated an initial 78% inter-rater reliability for this first cycle. After further consultation and comparison of initial codes, categories, and summarization notes (Lincoln & Guba, 1985), we reached 89% reliability by the end of the second cycle. The phrase in the data which lowered the initial percentage of coding agreement was *"I am excited about…"* I had intermittently coded this phrasing as a signal for success; my inter-rater colleague, however, did not perceive this as a statement of success, but rather a

statement of task completion. I deferred to her judgment as an unbiased outsider. A list of these initial codings and categories can be found in Appendix G.

Cycle Two, 2/10/2013 – 3/16/2013. In addition to the OneNote screen captures from the workshop wiki, I collected all other participant conversations within the Revision Histories available on the wiki and copied/pasted these in chronological order as well, adding this information to the data table started during Cycle One. I intentionally stopped the first data collection cycle before the middle sessions of the course started (mid-February) in order to analyze participant perspectives at the beginning of the course as compared to the middle and then the end of the intervention. Cycle Two data analysis started the first night of the middle sessions of the course. It followed the same pattern as Cycle One, constantly comparing and coding one incident against other incidents that had previously occurred. The same coding list was used for this second cycle (Appendix F).

Cycle Three, 3/17/2013 - 5/28/2013. The qualitative data analyzed for the third cycle of data were collected from the follow-up interviews conducted with each participant after Central City's spring break and after the end of the three-month professional development course. The last interview was conducted May 17th, three weeks before the school year ended. It was important to work around the teachers' hectic schedules as they prepared for end-of-year assessments and activities. Guiding questions for the semi-structured interviews included (1) what things participants had learned during the semester, (2) future plans for technology in their classrooms, especially if they wanted to try online student collaboration, (3) factors at their schools that continue to affect their utilization of the Internet with students, and (4) what I should change about the PD course when I try it again with other teachers. Beyond the guiding questions,

teacher participants showed me student projects that they had done with their students during the semester either online or offline, or they showed me additional items that they had recently added to their online projects and what they hoped to do next. After the interviews, written transcriptions were made from the audio recordings. I sent copies of the transcriptions to the individual participants, asking them to read and edit the content, for a member-checking process (Creswell & Plano Clark, 2011). I received written comments back from the participants, confirming that the content of the transcripts were accurate. Only minor surface errors (e.g., grammar errors) were suggested for edits.

To start the process of analyzing and merging the new data from this cycle, printed transcriptions of all the follow-up interviews were randomized. The eleven teacher participants were then given a new generic label: Participant #1, Participant #2, etc. I started the coding process in a similar fashion as before, reading sections from the individual transcriptions and constantly comparing a new section with the sections previously read. After reading all of the transcripts, I edited the code list used throughout Cycles One and Two to include new codings that emerged from the interview transcripts. (See Appendix G.) These raw transcripts were sent to another research colleague for a second inter-rater reliability check along with a list of my initial codings from my first read of the transcripts (available in Appendix H). The results from this second inter-rater reliability check provided an 89% reliability rating for the interview coding, again using a percentage check: total number of correctly matched codings divided by total number of codings completed by colleague. After conferring with my colleague concerning one category, Student Growth, coding reliability reached 99%.

Data Reduction Process

I started an initial data reduction process by summarizing all transcribed and coded data (Bogdan & Biklen, 2007). The eleven teacher transcripts were broken into sections according to topics discussed. Each section was summarized, keeping key quotes intact within the summaries in an attempt to keep the original intent of the participant comment. Memos or word phrases were written in a second column next to each summary. The summarized sections from each transcript were then copied and pasted into a data display called "First Sort for Interviews." This first sort was organized by the five original research questions asked in this study. With a goal of maintaining rigor and validity while focusing upon the complementarity intent of the mixed methods design, each summarized section of each transcription was placed within this first sort, without using participant identification, in an effort to corroborate, refute, or uncover possible themes emerging from the data (Creswell & Plano Clark, 2011).

Data Consolidation

After each of the data collection and analysis cycles, quantitative and qualitative data that had been separately analyzed according to traditional methodological procedures were then merged into various data matrices (Creswell & Plano Clark, 2011) or data displays (Bogdan & Biklen, 2007) based upon the research questions originally posited as well as questions that arose from researcher notes written after each workshop session and memos written as qualitative data were coded. Data matrices or displays were further integrated and synthesized to clarify the findings for the study. Creswell and Plano Clark (2011) recommend the development of data matrices as a way to merge data to "facilitate comparisons and interpretations" (p. 67).

After the three data collection and analysis cycles were completed, I continued to compare results from the different data displays against each other, peeling back the overlapping layers to confirm or disconfirm answers to my questions. During this time I read and reread researcher memos and notes collected throughout the project and often went back to reread portions of the raw data collected throughout the study. The use of data matrices throughout this process assisted in my efforts to seek "clarifications, illustrations, and enhancements" (Greene, et al., 1989, p. 159) as a way of understanding the phenomenon I chose to study. Examples of the data displays and matrices are available in Appendix I. Due to the large size of the various data matrices, I further edited and consolidated them, also adding explanations where necessary, when creating the tables used to discuss findings in the next chapter.

Data Legitimization Process

Onwuegbuzie and Mallette (2011) developed a typology for validity or trustworthiness within mixed methods studies they described as data legitimization. This process assists the researcher in assessing possible threats to the research validity, and then suggests ways to strengthen the data collection and analysis process to overcome these threats. Six of the nine legitimation types were used in this study.

Inside-Outside

This legitimation type, *inside-outside,* examines the extent to which the researcher accurately presents and uses alternating view points for purposes of accurate description and explanation of the phenomenon being studied. For this study, data were collected from several different viewpoints in an attempt to collect both insider and outsider

viewpoints: (1) detailed researcher notes and additional memos were written after each session, (2) follow-up interviews allowed each participant to share individual viewpoints of the learning process, and (3) a unique view was captured within the workshop wiki. As an example, participants used the comment feature on the bottom of the Google Sites wiki pages for instant messaging during the class sessions. Participants also wrote collegial notes of encouragement and comments to each other in their reflection journals.

In addition, coding from two cycles of the qualitative data were analyzed by two researcher colleagues as a method of insuring reliability from an outsider point of view. Finally, member-checking was completed with the participants from the study as a method of accurately portraying the unique perspectives of each teacher.

Paradigmatic Mixing

This legitimization type, *paradigmatic mixing,* refers to the extent in which researchers align their epistemological, methodological, and theoretical assumptions underpinning the quantitative and qualitative approaches used in the study. This step took place over a three-year process leading up to this third iteration of research. All of the design choices made have the common epistemological thread related to pragmatist paradigms (Barone, 2011; Brown, 1992; Greene, et al. 1989; Hansen, et al., 2005).

Convergent Parallel Design

Creswell's and Plano Clark's (2011) convergent parallel mixed methods design aligned well with Greene and colleagues' (1989) complementarity purpose. Both this design and purpose afforded strengths within a mixed methods design that align with four of Onwuegbuzie's and Mallette's legitimization types. A legitimization type described as

weakness minimization was built into the design. The weakness inherent in utilizing a small sample for quantitative data was strengthened by the qualitative data collected simultaneously. And, possible weaknesses caused by researcher bias when reading and coding qualitative data were supported by the use of more objective, quantifiable data during each data collection and analysis cycle. Another legitimization type, *sequential*, is inherently strengthened by the parallel design chosen for this study. Weaknesses in some mixed designs appear when the order of data collection can possibly affect the outcomes of the research findings. By collecting both types of data simultaneously for each of the three cycles, this validity concern was more unlikely to exist. A legitimization type labeled *conversion* assesses the extent to which qualitative and quantitative data are converted during the analysis process in order to yield inferences from the data. The process of "quantitizing or qualitizing" data, often an important step when conducting meta-research projects, is not used in a convergent design (Creswell & Plano Clark, 2011). Quantitative data are collected and analyzed by recognized quantitative methods and qualitative data are collected and analyzed by recognized qualitative methods prior to the convergence, or merging, of the analyzed data. A fourth legitimization type, *multiple validities*, is also inherently present within the parallel convergent design chosen for this study. Validation processes were utilized for both qualitative and quantitative analyses during three separate data collection and analysis cycles in an attempt to address this legitimization type.

As described by Creswell and Plano Clark (2011), the convergent parallel mixed methods design is a good choice for researchers new to mixed methods:

> The design makes intuitive sense. .. It is an efficient design, in which both types of data are collected during one phase of the research at roughly the same time. Each type of data can be collected and analyzed separately and independently, using the techniques traditionally associated with each data type. (p. 78)

The strengths of this design, as related to the data legitimization process and to its alignment with the purposes of this study, solidified the final planning stages for researching this complex, multifaceted phenomenon involving new technologies.

Summary of Methodology Design

This chapter described the use of a convergent parallel mixed methods design (Creswell & Plano Clark, 2011) with a complementary intent: seeking to measure, illustrate, and clarify the overlapping facets of a complex phenomenon (Greene, et al., 1989). Originally framed within a formative experiment model (Reinking & Watkins, 2000), this chapter also described the realignment of the research to a case study framework (Merriam, 1998). Qualitative and quantitative data were collected concurrently from multiple sources and then analyzed separately in three different cycles. I conducted post hoc reliability tests with the quantitative data collected from the pre-/post-workshop surveys. Qualitative data were also validated with two separate inter-rater reliability checks as well as participant member-checking of the interview transcriptions. During a data reduction process, I combined the analyzed quantitative and qualitative data into displays or matrices in order to gain a clearer understanding. Finally, the data matrices were consolidated to make the tables used in the next chapter.

While using this mixed methods design may have added complications during a novice researcher's first solo journey, I am confident that the multiple methods employed

were needed if I truly wanted to understand the complex phenomenon I chose to study within the dual roles of embedded researcher and professional development instructor.

As explained by Croninger and Valli (2009), a mixed methods design may "enhance our understanding of instructional practices and aspects of the social and cultural contexts that influence [the complexities of reading] practices" (p. 541). Guided by the framework of a formative experiment, I captured a better glimpse of how practicing teachers might harness the multifaceted, constantly-changing world of an online learning environment to improve student new literacies skills.

CHAPTER FIVE: PRESENTATION OF DATA

Eleven junior high teachers and two administrators participated in a three-month professional development course that was designed to guide the practicing classroom teachers as they learned how to use online applications related to twenty-first century skills aligned with the new Core Standards. Their pedagogical focus throughout the course was to integrate these new technologies into their curriculum in order to increase their students' critical reading and writing skills. The teachers created course projects that integrated online collaborative applications into their existing curriculum. Applications included Moodle, wikis in Google Sites, collaborative applications in SchoolFusion (the host school's learning management system), and various forms in Google Drive. The purpose of this study was to examine the effects of introducing and using these interactive, collaborative online applications as a means of increasing practicing teachers' technology knowledge and skills and as a way of shifting pedagogical thinking and classroom practices to accommodate effective student use of the Internet within content areas.

The results in this chapter are organized by the categories and themes derived from the data analyses and consolidation processes. Three categories include (1) the success of the professional development intervention, (2) key factors impeding or enhancing teacher use of online collaborative applications in their classrooms, and (3) findings about motivation and guidance for teachers-as-learners. Details about each

category, along with supporting evidence from the data, will be discussed in this chapter. The essential research questions are included in each section.

Overview of Findings

First, teacher participants did report gains in individual growth regarding technology knowledge and skills. Findings also suggested the willingness of these participants to overcome potential frustrations and barriers during the learning process, mainly motivated by the successes seen with student learning and the need to align with the new Core Standards. A majority of the participants also indicated a desire to continue student online work in the future.

Secondly, the original pedagogical goal for the workshop—using online applications to increase student critical reading and writing skills—was not achieved by a majority of participants in the study. More time than what was allotted for this study was needed for teachers to complete a successful, online collaborative project with their students and objectively measure student growth. Key factors involving time limitations and technology logistics were explored as possible barriers which may have prevented a smoother transition of collaborative use of the Internet for teachers, like these participants, who were willing to try new innovations in their classrooms.

A third group of findings supported the concept of teachers-as-learners, highlighting the possible motivational factors and the need for differentiated guidance by all teachers during the learning experience. Learning differences were also noted between those teachers who were just beginning with online applications and those teachers with previous experience with online applications. Findings supported characteristics of technology mastery for teachers which included abilities to transfer

skills from one application to another, abilities to choose applications for specific purposes, and abilities to find ways to work around technology barriers.

Professional Development Intervention

Both quantitative and qualitative data demonstrated an overall success of the professional development course used as the intervention of the study. Teacher participants reported growth as they completed the post-workshop survey. Findings that emerged from the qualitative data, collected from the workshop wiki and the follow-up interviews, also confirmed successful growth in regard to using Web 2.0 technology for academic purposes. These gains answered RQ #3: Will individual teacher participants perceive a significant growth in their technology knowledge or skills? Key findings connected to the success of the intervention will be discussed in this section.

Survey Results

Ten teacher participants completed the pre-workshop online survey at the beginning of the first class, and then completed a similar post-workshop survey within a week of the last night of class. (The eleventh teacher participant is not reflected in the quantitative survey findings in this section but is included in findings from qualitative data analysis.) I conducted a paired sample (within-subjects) t-test using the combined total scores from seventeen scaled items (Figure 4.3), comparing the total pre-survey composite scores against the total post-survey composite scores. Table 5.1 provides details from this statistical analysis. This analysis, conducted with IBM Statistical Product and Service Solutions (SPSS), measured a significant increase in participant

technology knowledge and skills for the composite scores from the pre-/post- workshop survey (t-test results: $t(9) = 8.116$, $p < .001$).

Table 5.1
Participant Growth: t-tests from Composite Scores

Total Composite Score Paired Samples Statistics: Paired Samples Correlation: .841 Significance (2-tailed) < .001				
	Mean	N	Std. Deviation	Std. Error of Mean
PRE Composite	33.2	10	11.76	3.72
POST Composite	50.9	10	12.57	3.98

The scaled items used in the composite scores, listed in Figure 4.3, represented topics which were explicitly taught within the professional development course. These included (1) knowledge about using online collaboration applications with students for instructional purposes, (2) experience with wikis and blogs for academic purposes, and (3) experience creating hypertext with online applications for student use. The more-experienced participants came into the course with proficient skills in using the school's SchoolFusion application and online databases such as Libraries Linking Idaho (LiLI). This was noted by their higher ratings of these items on the pre-workshop survey. Some of the items in the survey were not explicitly taught, but closely connected to the Web 2.0 applications which were being taught. As an example, experience using mobile devices was not explicitly taught during the three months of the course. However, both participants and I brought a variety of mobile devices to the face-to-face sessions; collaboration and small-group discussions among participants often involved the use of mobile devices to work around the limited Internet access in the host school's computer lab.

It is important to note the small participant size when discussing the results from the quantitative data in the survey. However, within the limited scope of this study, the total gains measured with the survey provided an important perspective and a starting point for the further qualitative and quantitative analyses which followed.

Individual Participant Growth

Individual teacher participants reported gains in their personal technology knowledge and skills, measured both quantitatively with the pre-/post-workshop survey and qualitatively in follow-up interviews and workshop wiki reflections. Teachers with limited or beginning technology skills appeared to benefit the most from the intervention. These findings continued to answer RQ #3: Will individual teacher participants perceive a significant growth in their technology knowledge or skills? They also helped to explore RQ #4: Are there changes in teachers' pedagogical practice in regards to using technology with students in the future? If so, what type of changes?

All ten participants who completed the pre-/post- workshop survey self-reported gains in their technology skills and knowledge. Nine of the ten participants who completed both surveys reported significant gains. See Table 5.2 for specific details. Qualitative data also confirmed this individual success. However, gains perceived by the participants applied to a wide range of Web 2.0 applications which individuals identified when describing their growth.

For teacher participants building wikis, some described their growth as "huge," "eye-opening," and "growing a lot." Others were appreciative learning the background information and becoming more comfortable with the online application such as wikis. Ted, the one administrator taking the course for credit, confirmed the individual growth

Table 5.2
Individual Participant Growth: Quantitative and Qualitative Data

Pseudonyms	Total Survey Raw Scores **		Significant Gain (*)	Tech levels reported ***	Project started or completed (Name of Application)	Follow-up Interview comments: *Q: Talk about your individual professional growth over the semester.*
	Pre	Post				
Robyn	51	67	+ 16 *	E	Completed (Moodle)	*"What you really exposed me to were the LESCs [online reading comprehension skills]"*
Amelia	36	41	+ 5	E	Started (Google Sites) Completed (Google Drive)	*"I think it went well… I wasn't great this year, I think, trying to work through it… Second semester is kind of a hard time for me." …"I'm just keeping it in the back of my mind,trying to figure out where it will fit best, or what I'd like to try…"*
Summer	44	60	+ 16 *	I/E	Started (Google Sites)	*"The biggest thing for me was the availability. [That was] eye-opening. I had no idea that so many of those things were out there."*
Olivia	46	65	+ 19 *	I/E	Completed (Wiki on School Fusion)	Discussed student growth, but not personal growth: *"I thought that would be a good way for me to use it within my actual curriculum with the students."*
Linda	32	47	+ 15 *	B/I	Started (Google Sites)	*"[The growth I made was] huge. I've had some other teachers look at it and they're asking me, well how can use this? So it's been good. Very good."*
Alyssa	19	45	+ 26 *	B	Started (Google Sites)	*"Well, I grew. I think I grew a lot. I went [into the class] very green. Because I had stayed away from a lot of the web pages. I had no clue how to start something like that. I'm still leery, but at least I have the beginning background for that. So, I feel more comfortable."*
Lauren	28	44	+ 16 *	B	Completed (Wordle) Started (Google Sites)	*"Just getting confidence is what helped me the most."*
Aaren	27	43	+ 16 *	B	Started (Google Sites)	*"I learned a lot about Moodle and other programs as those that I can use in my classroom."*
Kevyn	35	66	+ 31 *	B	Completed (Moodle)	*"…seeing all of the stuff that is out there that [our] kids absolutely need."*
Dale	15	--	?	B	Completed (Google Drive)	*"I learned about Excel in Google Docs. And I got to actually use it [with my students]."*
Sharon	14	31	+ 17 *	B	Started (Google Sites)	*"I don't know how far I'm going to go with my [novel] plan [on my wiki].*

Note. *Significant Gain = > 12.6 points gained from pre- to post- survey (12.6 = one standard deviation)
** Total Score possible on survey = 68 (17 items x 4 as highest rating)
*** Technology Levels Reported on pre-workshop survey:
E = experienced: high survey score + had tried online applications with students
I = intermediate skills: high survey score + had tried online applications but on a limited basis

B = beginner skills: less than 50% on survey score + had not tried online applications with students

of the teachers taking the course. In his words, several of the teachers took ideas from the workshop "and just ran with it and expanded it," such as Sharon when she started a wiki for her social studies department:

> …I went and sat in on their PLC session, and they were so excited to show me what they had done. They had just taken and expanded [Sharon's idea] big time with it. A person by the name of Mr. Mxxxx [not a participant in the workshop] …he just took it and jumped on [the wiki that Sharon had created]. He was so excited about it. He took it and ran with it as well, so now there's all sorts of stuff on [links connected to] our SchoolFusion and all these links and all these formats and all this wiki stuff that it's kind of exciting." (Interview, 1 May 2013)

Other interesting details about individual gains surfaced during the follow-up interviews. Many of the teachers with beginning technology skills discussed their confidence levels increasing. Lauren, who completed a student project using Wordle during the workshop as well as started on a student wiki for future use, still admitted that she was "intimidated" by doing "all this." But talked openly about how the course had built her confidence level:

> Just getting confidence is what helped me the most. The class helped me get some confidence, and then it's okay if it's not perfect the first time. Just fumbling through it a bit [is okay]. Like, when I took the kids to make their Wordles, it all worked out. …It's not as smooth as what I normally do. Because it's new. And I'm not awesome with technology, but the kids are. So, I think that the kids

> didn't even notice [me fumbling through it the first time]. (Interview, 29 April 2013)

Dale, the teacher who accidently missed pushing the submit button for his post-workshop survey results, also discussed his technology growth and building his confidence level with technology in his follow-up interview. Bruce, a participant who was an intern administrator at Hawk Bluff, worked one-on-one with Dale on a regular basis during each week to help guide him through a project using a Google spreadsheet for a math unit with statistics. During our interview, Dale enthusiastically shared how the project was completed and what his students had gained because of it. When asked what he was going to do in the future with technology, he commented that he'd like to start with a similar project again next year. Dale said that he liked to learn along with his students: "Yeah, yeah. It's a learning situation for all of us." When asked where I should go next with my professional development ideas, Dale commented:

> I would love to do what [you] had set up for this [workshop], where you have the kids commenting on line, and all that kind of stuff. I would love to set that all up at some point, something like that. …I thought that was biting off too much at this point. Because I didn't know where that was going at all. [For my first project, I chose a Google spreadsheet.] I knew a little bit about Excel. If I could figure out how to use that through Google, that would be cool. And then, I could actually do something with it and make the actual product with my students, which we did. (Interview, 24 April 2013).

Changes in Future Pedagogical Practice

As demonstrated in Dale's comment, above, the use of online applications for student collaboration remained a future goal for most of the teacher participants with beginning technology skills. However, teacher participants did report their desire to continue their use of online collaborative applications, either for teacher collaboration or student collaboration. Data related to this topic answered RQ #4—were changes in teachers' pedagogical practice seen in regard to using technology with students in the future; and if so, what type of changes.

Quantitative data for this question were collected in the last section of the post-workshop survey with close ended questions (Figure 5.1). None of the participants marked 0 = *I'd prefer not to do this*, so that rating is not included in the table. On all seven of the questions listed in Figure 5.1, only three participants marked "*1 = I'm interested, but my skills are not adequate for me to pursue this on my own*." The rest marked ratings of 2: *I might, depending upon the situation* or 3: *I definitely would*. This reflects a high degree of confidence and skills gained. In comparison, while taking the pre-workshop survey with a similar rating scale, a majority of the participants (5 out of 11) marked "*I'm interested, but my skills are not adequate*" on every single item referring to using wikis or blogs for collaborative purposes.

Future Preferences from Post-Workshop Survey			
Ratings 0 = I'd prefer not to do this. 1 = I'm interested, but my skills are not adequate for me to pursue this on my own. 2 = I might, depending upon the situation. 3 = I definitely would.			
Using a website (like a wiki) created by a colleague for collaborative purposes	0	**1**	
	40%	**2**	
	60%	**3**	
Creating a class website (like a wiki) for students to	10%	**1**	

view content information	20%	2	
	70%	3	
Creating a class website (like a wiki) for student-to-student reflection or collaboration.	0	1	
	30%	2	
	70%	3	
Using a document on Google Drive for teacher collaboration	10%	1	
	20%	2	
	70%	3	
Creating a document on Google Drive for student collaboration	0	1	
	40%	2	
	60%	3	
Using more of the digital tools available on my district's website (e.g., Moodle or School Fusion tools)	0	1	
	40%	2	
	60%	3	
Creating online spaces (with apps of your choice) for student-to-student collaboration	10%	1	
	40%	2	
	50%	3	

Figure 5.1. **Future preferences: Percentage of participants reporting future use of online applications. Data collected from post-workshop survey. N = 10**

Qualitative data concerning future pedagogical practices were collected during the follow-up interviews. When specifically asked, a majority of the participants (8 out of 11, or 73%) did want to continue towards the goal of student-to-student online collaboration for the purpose of increasing critical reading and writing skills. Of the three who did not, one participant only discussed future technology goals in connection with teacher presentations (i.e., using Prezi during lectures and student discussions) or to increase offline student technology skills (i.e., using Word documents to type essays or reports). The other two who showed hesitancy had different reasons. Amelia, who had successfully used wikis with students in the past, wanted to keep it all in the back of her mind and wanted to wait and see where online student collaboration would fit best into her curriculum. Alyssa, a technology beginner, felt that she was not quite ready: "I still have a lot to learn. So, even thinking about bringing a class into the computer lab and doing Animoto, or any of those [applications], would make me a little nervous"

(Interview, 16 May 2013). However, Alyssa did share that her opinion about technology had changed throughout the semester:

> Oh, my opinion has changed. I know that this is something that's here to stay. And, you know, we've got to get on the band wagon and do it. And, some of us are leery and kind of stand-offish a little bit, but… we've got to do it. Got to do it. … *[Q: Where do you want to head next?]* Right now with the Common Core and the changing of all the testing, I really haven't a clue. I need to see the scope and sequence, see everything first. And then, I can go from there. But I know I'll have to bring in more technology. That's a given. But I don't know where, how, when, what… A year from now, I'll know a lot more. (Interview, 16 May 2013)

Perceptions of Student Growth

I had designed this study with a specific focus question in mind: RQ #1: If teachers construct and implement units of study within their content area that use socially-constructed applications, will teachers be able to document positive student critical reading and writing growth in their classrooms? This first research question remained unanswered at the end of this study. This was mainly due to either the beginning technology levels of the participants or the short, inconvenient time frame for those participants who tried to complete a student-to-student collaborative project. Those participants who did complete projects with students did not assess the use of the online application separately; all assessment was conducted within the existing curriculum structure (e.g., teachers used grading rubrics or regular testing formats for assessment).

However, the idea of student-to-student collaboration appeared to be enthusiastically embraced by a majority of the teacher participants as a future goal. Even

though no specific documentation about student gains in critical reading and writing skills was separately collected, participants did discuss student growth, engagement and motivation with the technologies. Many instances of student progress were visible throughout the follow-up interviews and in the participant written reflections. A majority of teacher participants (6 out of 11, or 55%) did create lessons using digital applications and did try them with their students (Table 5.2). One team, Kevyn and Robyn, used the Moodle platform for an interdisciplinary science fiction unit for 8th grade English language arts and reading classes. They intended student-to-student collaboration as an ultimate goal between their two classes. Two individual teacher participants successfully used Google Drive with students. One teacher, Olivia, learned how to use the district's Learning Management System (SchoolFusion) for discussion between students on a limited basis. (Much of the discussion was still face-to-face in the classroom as students shared the information they had posted.) Also, one teacher with beginning technology skills successfully completed a student project with Wordle within a social studies unit.

Summer shared a success story about one student whom she allowed to type an English assignment on his smart phone. While it was not an example of student-to-student collaboration for academic purposes, Summer used it as an example for why she wants to keep pursuing the use of online applications with her students in her classroom. She reflected about the student's excitement when she gave him the opportunity to try typing it on his phone:

> So there it [the assignment] was, a day later when it was due, in my email. And it was extensive! I mean, exactly what I asked for—with his two thumbs! Two full pages—correctly edited, spell-checked, the whole nine yards—from his phone.

> This is what I want; it's so much easier, streamlined. There was his email, and I was able to immediately reply back without rifling through 150 papers. (Interview, 17 May 2013)

Olivia, a special education teacher, talked about student success in terms of how the technology "leveled the playing field" for her students:

> My kids really did like it and they were capable of using it. …I think, at this point, I use Fusion more than any other teacher in the school because of it. Because my kids know how to use it. I'm funneling them into it more. I'm using it for assignments, then also for discussion boards. …They do better on the computer than when it's handwritten; it's a less strenuous effort when it comes to typing on the computer. It helps their quality [of writing] and their fluency. …You know, on the computer, it's harder to tell the difference [between my students and students without handicaps]. (Olivia, Interview, 8 May 2013)

Measures of Student Proficiency. I had developed a tool to help teachers measure student gains connected to the four anchor CCSS standards, their content curriculum goals, and the use of the technology (Appendix E). I discussed this option individually with participants during the middle workshop sessions, but none of the participants tried using it. Again, it appeared that the lack of time was the main deterrent in using this tool. Teachers struggled finding time to implement the technology applications within their existing curriculum and assessment procedures.

Other Findings from Instructional Materials

Other findings emerged, mainly in the follow-up interviews, which demonstrated strengths of the instructional materials and activities used throughout the professional development course. First, individual teacher participants described their appreciation for the connections between the technology applications and how students learn. Kevyn described it as "seeing all of the stuff that [was] out there that these kids absolutely need" (Follow-up interview, 24 April 2013). As another example, when I asked Lauren about what specific things had helped her during the workshop, she commented that she liked the "working sessions" in the middle months of the workshop. She further explained, "…you talk[ed] about how this helps teaching; how this helps kids learn. [In the past], we kind of just jumped into it: here's the technology, but we didn't have the *why* part" (Interview, 29 April 2013).

Several of the experienced technology teachers reflected upon connections to the course content. As an example, Robyn was the only participant to discuss what she had learned about the LESCs—locating, evaluating, summarizing, and communicating information—as related to new literacies reading comprehension skills (Coiro, 2003; Leu, Kinzer, et al., 2004). Robyn explained:

> Well I think the biggest thing that you exposed me to was [information about] the LESCs. … What I really value is meeting somebody who has information that I want to grab onto and really change on how I'm teaching completely. [This new information] really forced me to think about informational text and our digital reading. So, I took a whole different slant after you talked to me about that and went in and read more about her [Coiro's] work. .... that has been the basis for

> both of the grants that I just wrote, that we need to move in this direction. …With the sunsetting of the ISATs [our current statewide assessment], we need to be on board because this [technology on the Internet] is the future. (Interview, 24 April 2013).

CCSS Alignment Activity. Another more-experienced technology teacher, Summer, commented on the CCSS alignment activity (Appendix D) during the follow-up interviewing process. Upon reflecting what she had learned, she commented,

> The most stunning thing that happened [during the workshop] was the survey that aligns with the Common Core. Because I think—or at least I love to think—that I'm just the savviest person out there, and I'm already using X, Y, and Z as part of my day-to-day instruction. And then, [after completing the activity], I find out I'm [teaching the Core Standards] at about the 3rd grade level—ewww!… It was hugely helpful" (Interview, 17 May 2013).

Not all participants completed their summaries for the CCSS alignment activity. However, those who did offered further insight into the connections between the Common Core standards and how teachers may use the standards to guide their future technology pedagogical decisions. In Bruce's summary, he reflected upon the big "take-aways" during the whole-class discussion after completing the first part of the CCSS alignment activity. He then described a technology connection that he had noticed:

> The Hawks Bluff staff is spot on with their grade level standards. However, [they] lack [knowledge] with the vertical level standards. Staff members are taking a great step in the right direction. Key focus is knowing their individual standards at their grade level. The next step with common core is for teachers to know the

> vertical alignment of CCSS from k-12. So that they may re-teach and pre-teach standards.
>
> We feel that many of our teachers also see the value of the wiki. They are currently working on creating and setting up wikis in their own classes. Mr. Jones convinced his fellow peers to formulate a Wiki site for collaboration in the subject of history. When we viewed it they had already developed a common vocabulary that all students would comprehend. Very exciting tool for Hawks Bluff. (Summary of CCSS activity, sent by email, 9 February 2013)

Amelia, a more experienced technology user, also wrote a CCSS summary. She started her summary with what she had discovered as she completed the activity:

> I've found, every time I look closely at the CCSS, I recognize that my students have a long way to go. We have heretofore spent a lot of time on recall and Level One knowledge without moving into the high level synthesis and analysis the CCSS are asking for. I've known for some time that we have a lot of changes that need to be put into place. (Summary, attached to bottom of wiki reflection page, 20 February 2013)

Amelia then reflected on the positive, "flip side" of the Common Core standards as she goes forward with her students. She described these changes that will "take a shift in teaching and a shift in student work:"

> I also know that we have students capable of doing the higher level standards, if we scaffold and help them along the way. I see in the future that I will continue to use the CCSS a little at a time and as time goes on students will be able to work

> at a higher level and meet the standard requirements. It takes a shift in teaching and it takes a shift in student work. Both of us are capable of this shift if we go ahead and take the leap and give it a try. I'm excited about what the future will hold and the places it will take our students. (Summary, 20 February 2013)

Amelia's and the other participants' reflections, described above, allude to a similar theme seen throughout the findings. The CCSS standards, as they pertain to technology and literacy, are going to require a challenging shift in teaching and a shift in student work. This shift is going to take time, but students are capable of meeting the higher standard requirements if teachers scaffold the learning along the way. Professional development trainings that help guide teachers *how* to do this and *why* students should learn at higher standards are an important part of the process.

Summary of Intervention Success

Overall, the intervention—a three-month professional development course designed to increase teacher's integration of technology into their curriculum—was successful. Both qualitative and quantitative data provided evidence that the course had been effective; teacher participants perceived themselves as making significant gains in their technology knowledge and skills. A majority of the participants also discussed their desire to continue their goals of using online student-to-student collaboration as a way of increasing critical reading and writing skills.

Key Factors

Findings from this study highlighted key factors that may impede or encourage teacher use of online collaborative applications in their classrooms, answering RQ #2:

What factors will enhance or inhibit the effective use of these online applications? Qualitative data to answer this question were collected primarily from the workshop wiki that was created to organize the professional development course as well as provide a practice learning environment for the participants.

During the data reduction process after the first two collection cycles, I categorized codes emerging from the data into two broad areas: (1) communications between colleagues or instructor and (2) connections with course content. I labeled a sub-category as "emotions or reactions" added to the reflections or comments. These emotions or reactions were further categorized as (1) positive (++): participants reflected upon overcoming obstacles or learning something new; (2) negative (- -): participant comments referred to frustrations or challenges that might not be overcome; and (3) hopeful (~~): reservations were seen, but participant comments were either hopeful or ambivalent as they kept an open mind toward the challenge. (See Appendix G for the code list.) After the coding process had been verified by outside research colleagues, I collected the codings marked with the emotions/reactions (i.e., --TECH, ++TECH, ~~TECH) and consolidated them into a data matrix. An example from this matrix is available in Appendix H: Data Matrix #2: Progression of Teachers as Learners. I consolidated information from this data matrix with data analyzed from the follow-up interviews to form Table 5.3.

Table 5.3
Key Factors Inhibiting or Enabling Teacher Use of Technology with Students

Factor	Characteristics	# of Incidents coded in data			Example Quote
		Cycles 1 & 2	Cycle 3	Totals	
Time	Lab time for classroom use	2	3	5	*"I do have, already in my notes for next year, to book the lab so I can get in there. For one reason or another, the lab is hard to get into."* Sharon,

					Interview
	Teacher overload	2	8	10	*"And so, when they're like, 'Let's take a class on – say a Moodle class,' I just don't have time for that because I've got 7 discipline referrals to take to the vice principal…. Do you know what I mean?"* Summer, Interview
	Amount of time it takes for teachers to learn new applications	7	5	12	*"The one difficult thing about technology – it seems to always take longer than you think to plan everything out, get it linked up and created, and then have it ready to go."* Amelia, Wiki reflection, 2/4/13
	Time to teach students technology within existing curriculum constraints	2	8	10	*"And to get the kids [ready]… you know, it takes time to train them how to do it."* Olivia, Interview
Technology	Logistics	1	6	7	*"There are still severe roadblocks … logistics, like .. Not everyone has their own device. The computer lab's booked for ISAT. .. with our general [lack] of availability of computers… you cannot ask kids to do [online] stuff yet. Which makes absolutely no sense, but that really is the way that it is. That is the reality of still where we are. And I really think that it's going to get better… Our district is really slowly trying to get to that point. …but honestly, I don't know when that will happen."* Summer, Interview
	Socio-economic	0	5	5	"Our school is in such a demographic where kids… you cannot rely on a kid to have Internet access at home. Nor a computer, for that matter." Kevyn, Interview
	Teacher frustrations with technology issues	23	11	34	*"As I get more knowledge and try more things with my wiki page, the frustration seems to mount. …I built an Animoto, and tried to view it, but keep getting ERROR MESSAGE. The problem may lie in the fact that I am using their free version. But that is what the students will be using"* Linda, Wiki Reflection, 2/20/13
	Teacher successes with technology issues	38	9	47	"I tried to use Wordle.net with my new computer and was running into problems with Java. Frustrating me to no end. Finally I got it up and running on my school computer and expected it to be a difficult tool to use like my other tries. But, no, it was easy, fun, and got me excited to use it with my [students]" Alyssa, Wiki, 3/3/13

Many of the factors that were found prevalent throughout this study are not new—they have been analyzed and labeled in past research over the past few years (Karasavvidis, 2010). It is also interesting to note that several of the barriers perceived by participants in this study have been solved in other settings, particularly in recent studies taking place at the high school level or preservice teacher level (Lee & Young, 2011; Tarasiuk, 2010). It is important to discuss them here in relationship to this specific

case, however, as evidence that many issues may continue to hamper a smooth transition of technology into many traditional public school settings especially with younger students.

Key factors are organized into two sections below: (1) factors related to time and (2) factors related to technology. For the most part, participants in this study remained positive and talked about ways to "work around" the factors that they felt were inhibiting their use of new technologies with students. Both perspectives—successes and concerns— are represented here, but it is important to note that the majority of the participants remained hopeful. Time issues appeared to be the biggest frustrations. Issues with the technology, while frequently coded and counted, were seen more as things that could be overcome.

The Time Factor

Time—or more precisely, the lack of time—was one key factor seen as a possible barrier for teacher participants to implement new technologies in their classrooms. Again, the idea of time affecting the introduction of new pedagogical approaches to practicing teachers is nothing new (DuFour, et al., 2005) and was not surprising to this researcher, but it became important to rethink possible ways to approach this barrier within a traditional public school setting as represented by this case. Even though the teacher participants in this study had purposefully found the time to take on the burden of an extra night-time class and demonstrated positive flexibility throughout the workshop and interviews, glimpses of the time factor were clearly seen throughout the data.

Time barriers, divided into different categories during the data consolidation process, are represented in Table 5.3. These categories included (1) limitation of lab time

for content area classroom teachers, (2) limitation of teacher learning time outside of classroom duties, (3) the amount of time it takes to learn new technologies for the classroom for both students and teachers, and (4) the limited amount of time for students to learn new technologies within the existing curriculum. These four perspectives will be discussed separately.

Limited Computer Lab Time. This barrier was discussed throughout both wiki reflections and the follow-up interviews by approximately half (five out of eleven) of the teacher participants. At the time of the follow-up interviews, building-wide ISAT assessments were underway, closing down the computer labs to all classroom teachers at a time that many of the participants were hoping to try something new with their students. Lauren discussed this in our follow-up interview: "My thought was we'd look at …posters or pictures and then discuss online that way. I just didn't get it pulled together last past month.. oh yeah… our labs were shut down for two weeks, actually 2 ½ weeks [for ISATs], so it didn't work out well" (Interview, 29 April 2013). Sharon also discussed this when asked about her future technology goals: "I do have, already in my notes, to book the [computer] lab so I can get in there. For one reason or another, the lab is hard to get into. And I guess we need more labs in the long run… or a mobile lab would be nice" (Interview, 17 May 2013).

This time factor was also seen at the beginning of the course in written reflections: "Today I worked with Xxxxx to decide that we are going to work on a Wiki for 4th quarter. … I will try to have a Wiki example for one period I currently have. Computer labs are very difficult to schedule" (Kevyn, bottom of wiki home page, 30

January 2013). "With such limited computer access, I do not have time to teach students how to build a wiki page" (Robyn, wiki workshop reflection page, 10 February 2013).

Limited Teacher Time. This characteristic, the amount of time available for teachers to learn new online applications, was discussed in a variety of ways. The first data item in this category was collected after the first week of class in my researcher notes, labeled "participant attrition." Originally twenty-five participants had shown interest in the workshop, but due to a variety of reasons including sickness, family concerns, and after-school commitments relating to their jobs, ten potential participants were not able to attend the first week of class (Researcher notes and emails from potential participants, 27 January 2013 - 2 February 2013).

In the follow-up interviews, approximately half of the participants made comments referring to a lack of professional time when learning how to implement new technologies in classrooms. Several participants referred to this lack of time as "teacher overload." Reflecting upon teacher resistance towards using technology that she had seen among her colleagues, Summer commented, "Teachers are just having more and more and more to do. I sound like the cliché, but I feel that it's coming true" (Interview, 17 May 2013). Robyn's comment corroborated with this thought: "… I think that everyone is so busy now-a-days that they don't have time, though, even in a department, … to pick their heads up and go and help and work with someone else. …and even consider something new or different in the district because they're so overwhelmed with what they're just trying to get through. …And there are a lot of kids in that building. It's full time… you hardly have a minute to breathe…." (Interview, 24 April 2013).

Amount of Teacher Time Needed to Learn Online Applications. The most common reference to teacher time during the first two data cycles referred to the amount of time that it was taking to learn the new technology skills: "I did it! Wow so much, too little time!" (Kevyn, on workshop wiki reflection page, 28 January 2013). "It is hard to find time to play with a wiki, but when I do it['s] pretty straight forward" (Summer, on workshop wiki reflection page, 28 January 2013). Robyn also added a reflection referring to this time factor: "Transferring everything over will take HOURS and HOURS and HOURS of time I don't have" (workshop wiki reflections, 30 January 2013). The need for out-of-class practice time, beyond what was available during the work day, was noted: "Just enough time [today] to know i need to sit down for more than my prep to do this" (Lauren, on workshop wiki reflection page, 2 February 2013).

References concerning teacher time for learning new applications were also apparent within the follow-up interviews: "It just takes a lot of practice …tinkering…" (Lauren, Interview, 29 April, 2013). An insightful comment was made by a veteran teacher who openly admitted that learning Web 2.0 technologies were extremely challenging for her but wanted to keep learning because that was how her students "learned now-a-days." She commented: "I think teachers are open-minded and they're interested in learning new things. It's just the learning curve for a lot of this is very high and it does take time. And I'm not a person to sit there and fiddle. I want to do it now. I don't have time to mess around with the settings…" (Sharon, Interview, 17 May 2013).

Amount of Student Time Needed to Learn Online Applications. A subset of teacher learning time was labeled as student learning time. Throughout the follow-up interviews, as teacher participants reflected upon why they were unable complete their

websites for student collaborative purposes during the workshop's short time frame, a key barrier was the amount of time needed to instruct their students about using online applications for collaborative purposes. We had discussed these as Netiquette Skills during the first sessions of the workshop. The teachers who had tried online collaboration before the workshop confirmed this need for additional student instruction. As an example, Amelia had previously created and used a wiki for collaborative purposes with her students and discussed what needed to be done in order to prepare her students for success. In her comments, she added: "I've always wanted just to set up a wiki, and like –'here's our poetry section'- and everybody puts a page up and you go through and respond to what people have written. I really think that that would be helpful. And I just haven't done it, but that's something that I really would like to do. …It takes time to train [the students] how to do it. You need to do the etiquette, and you need to go through the checking" (Interview, 15 May 2013). When talking to Amelia, it seemed that she constantly weighed the amount of instructional time that it would take for her to set up an online learning environment as compared to the amount of time that it would take for her to reach similar learning goals within the boundaries of her traditional classroom. At the time of this study, she saw that the amount of instructional time to prepare her students for online learning weighed heavily in her decision-making process.

Teachers who had not tried online collaboration before the workshop also discussed the amount of time that it would take to prepare their students. For some of the teachers with beginning technology skills, the amount of time it would take to teach their students was sometimes seen as a formidable barrier. For example, Alyssa commented that she was leery about how she would instruct students to overcome the cyber-bullying

that she had seen in her building over the school year. She added, "…And I don't know what that would look like in the classroom. I could see kids getting carried away with it [collaborating with online applications]. So, the whole idea of trying to monitor that and getting the kids serious about it…. I think it would be a challenge" (Interview, 16 May 2013).

Time Barriers within Existing Curriculum. Some of the participants implied a fourth barrier related to time: the existing curriculum did not allow for an additional technology component to be added to the schedule. In order to "get through" required course content in time to meet the demands of the district-wide End-of-Course evaluations (EOCs) each quarter, teacher participants did not see how they could add additional technology instruction to their already-crowded schedules. Amelia and her colleague Summer both reflected upon this. They had wanted to create a collaborative space with a wiki between their students during the spring semester, but had to stop their original plans. It appeared that time constraints in their curriculum were one of the reasons. Amelia commented, "I feel like second semester is kind of a hard time [for me]. During third quarter we only do [two district-required literature units], so sometimes it's hard to try to do something different or to take extra time for something" (Interview, 15 May 2013). Summer also reflected on time constraints: "This has been a much more daunting project than I thought it would be. I am feeling overwhelmed at school and at home. Anyway, hope we can make some traction at the next session" (Written reflection on wiki page, 27 February 2013).

Working Around Time Barriers. For the most part, the participants in this study remained positive. They discussed ways to work around the things that they perceived as

possible barriers to technology, especially the time barriers. There were two different teams within the study, and both discussed working around the issues of time. Amelia wrote in one of her last reflections, "I'm loving all of the things we are learning about how to edit and create our wiki page. I still feel like we will use it as a webpage more than a wiki.. but who knows… maybe next year we'll be ready to move on to the next level. I like, again, the possibilities that Summer and I have to work together and hopefully, in the future for our students to collaborate and share their work as well" (Written reflection on wiki page, 6 March 2013). Even though this team's plans changed during the course, they seemed to remain positive.

The other team, Kevyn and Robyn, also discussed how to work around the time constraints that they saw within their curriculum as the two of them discussed their ideas with me, speculating how to go forward at their school. They had successfully completed a collaborative online project for their students during the professional development course. They chose to use Moodle, an online course management system that was available on the district's server and had been used previously by Robyn. They had incorporated its capabilities of student-to-student collaboration into a new literature unit. After a lengthy discussion between the two of them during their follow-up interview, they arrived at several conclusions, most relating to working around the time barrier existing within the curriculum. They both felt that the technology needed to be integrated within core content subject areas and not taught separately in technology classes. Robyn reflected, "If we can develop skills that [our students] can transfer regardless of the program they're in. [For example,] when you open up Moodle and set up to create your tabs, it's all little Word documents. It's no different than being on Word. … If you know

one, then you can transfer. …" and later added, "That would be a skill for life." Kevyn confirmed, "…and that could be easily built into the schedule where everybody. … I think, in terms of the computer thing, it would be appropriate if each teacher taught that, as opposed to the home room teacher. The math teachers keep up with the math folder, the science teachers keep up the science folder…" As they continued talking, they both mentioned other concerns, such as teacher overload, lack of hardware components they wanted, and their frustrations about trying new applications within the school computer system:

> Robyn: …and like we were saying, we don't have access to computers. There's just not enough of them, and….
>
> Kevyn: …and the ideas are just coming at us. Just bam, bam, bam, bam, bam, bam….It's like I learned about Ticky-Tock. And then… what is it Glos..Glob-ster?
>
> Robyn: Glogster
>
> Kevyn: Oh yeah—Glogster. Glogster for doing digital posters? The sign in thing for that application is just… to sign in is just like… ugggggh....

Even though they both saw barriers and frustrations, their conversations continued to come back to the importance of using the technology and finding ways to work around the problems they were facing. They both discussed the advantages of combining student technology skills within all curricula across all content areas rather than trying to find time to introduce technology to students in an isolated fashion.

The Technology Factor

The above conversation with Robyn and Kevyn highlights another key factor which appeared to be inhibiting a smooth transition of using online applications within this particular public school environment. I labeled this group of possible barriers as the technology factor. (Table 5.3) Within this inhibiting factor, three different characteristics were separated: (1) technology logistics: keeping building technology infrastructures up-to-date or complications when using specific online socially-constructed applications within a public system, (2) socio-economic barriers: students did not have access to the Internet outside of their school day, and (3) other teacher frustrations caused by using online applications in new settings for the first time.

Technology Logistics. Struggling with technological logistics—insuring everything is loaded and working properly on computers in new settings—has been cited as an obstacle for teachers in other research studies (e.g., Heafner & Friedman, 2008; Karasavvidis, 2010). Findings in this study also alluded to logistical barriers. Beyond the need of more student time in computer labs, findings demonstrated teacher frustration with logistical issues when trying new applications with students. Some examples of logistical issues included (1) application functions blocked when using them with student logins in the computer lab, (2) obtaining parent permission for student email accounts, or (3) unanticipated student problems and questions concerning the use of the application which sidetracked students away from intended learning outcomes. These types of logistical issues seemed to exacerbate other possible barriers. As Robyn reflected during the follow-up interview, "…the coordination of student files, training the students not to go in and change anyone else's files …all of these little management things seem to

compound the problems" (Interview, 24 April 2013). The follow-up interview with Olivia, who works with students with disabilities, alluded to this: " ...exploration [with new applications] gets [my students] frustrated. Does that make sense? If I don't have the answers immediately, then they're like, 'Why are you teaching me something that you don't know?' I can just hear it. And they become over-critical. And then I've lost that teaching moment because they're frustrated because they want [the answers to their technology questions] right then" (Interview, 8 May 2013).

Teacher participants discussed the current process for obtaining parent permission and/or email accounts for individual students, a requirement for many socially-constructed online applications, as a "nightmare" when coordinating such logistics before launching popular applications such as many Google products: "… and the other thing that's really amazing is how many kids do not, and how many kids we assume do, not nave email addresses. And so, for many programs to log onto, they can't because they don't have an email address" (Robyn, Interview, 24 April 2013).

Socio-Economic Factor. The lack of Internet access for specific populations of students was highlighted as a possible barrier within this study. At least one participant from each of the three different schools represented in this study mentioned concerns about student access to technology at home. Summer stated, "There are lots of us who are wanting to experiment with this digital literacy component. But there are severe roadblocks. Really. I mean, like our school is such a demographic where …you cannot rely on a kid to have Internet access at home. Nor a computer, for that matter. Of course they may be toting their iPhone around at school, but they don't have Internet at home" (Interview, 17 May 2013). Definitive student population information about Internet

access was not acquired for this study, but about a third (four out of eleven) of the teacher participants, representing all schools in the study, still saw the lack of Internet access at home as a possible barrier for student online collaboration to be an effective learning tool for future classroom use.

Other Teacher Concerns When Using New Applications. Various concerns about introducing new applications to students within the school environment emerged from the data. Most of these I coded as "technology frustrations" during data analysis of the participant written reflections on the wiki. (See Appendix I—Data Matrix #2). Participants, both more experienced technology users and technology beginners, remarked about this issue. Some examples follow:

> I was taking a tour of our wiki in progress and thinking about how to add a picture. …and it just disappeared. Ugh!! Sometimes this online world can be really frustrating. Oh well, try and try again… (Summer, wiki reflection, 4 February 2013).

> The problem may lie in the fact that I am using their free version. But that is what the students will be using… (Linda, wiki reflection, 13 February 2013)

> Someone broke into Olivia's closed site on SchoolFusion. [The district technology coach] checked into the problem for her. Pieces of the wiki application in SchoolFusion were not working properly on the server (Researcher notes, 9 February 2013).

Some participants were concerned that their specific students were not mature enough to handle the openness of a collaborative website or similar online applications. I

made note of these concerns and categorized them with other technology frustrations. An example from Alyssa: "I think it's a great idea, but, in our particular situation with our school, I think it would be harder than if it was in a school where kids …take things more seriously" (Interview, 16 May 2013). A reflection from Linda also highlighted this concern: "I'm getting more comfortable [with the idea of student-to-student collaboration]. I haven't tried having [my students] put anything on yet. …I'm still a little concerned about inappropriateness because of the age group [that I teach]" (Interview, 1 May 2013).

A majority of the teacher participants, however, discussed the age-appropriateness of teaching their middle school general education students online collaboration skills, from a positive point of view (i.e., "I think my class is a great place [to introduce interactive applications]" Lauren, Interview, 29 April 2013). One teacher commented that online collaborative skills should be introduced in the younger grades, " maybe fourth grade or fifth grade" so when students reached the junior high, teachers "didn't have to spend the whole semester just showing students the basics" (Aaren, Interview, 16 May 2013). Even though I had discussed the need for technology skills to be integrated at younger and younger levels during the first sessions of the course (Appendix D: CCSS Alignment Activity), it was important to note how many teacher participants still talked about their concerns in this area.

Affordances of Technology. It was easy to see barriers blocking teachers from learning to use online applications in their classrooms, but it was equally easy to see key factors that motivated this group of teachers to continue learning new online applications. Several examples were quoted earlier, including Olivia's enthusiasm towards using

technology that "leveled the playing field" for her students with disabilities and Dale's success when using a Google spreadsheet with his students in the AVID program. In her last written reflection, Olivia commented, "The overall experience with kids was great! I really learned by [the] trial and error process. I really enjoyed using the SchoolFusion and Google apps to help with the lessons" (Written wiki reflection, 18 March 2013). Other examples were also evident from general education teachers. Linda reflected, "I keep working on my WIKI and keep finding things I can do with it. I hope to make it a useful learning site for my students (Written wiki reflection, 12 March 2013).

Robyn and I dialogued together on her wiki page throughout the workshop. At one point, after Robyn had completed a quest concerning her pros/cons list for possible applications to use for her project, I commented, "Robyn, your pros/cons list is insightful and helpful to others who may want to try online apps with students. …Now the big question: do the pros outweigh the cons?" (Instructor comment, Robyn's wiki reflection page, 6 March 2013). She responded, "The pros absolutely outweigh the cons. I am in the process of writing a grant proposal to acquire computers for my room. Already I am dreaming of an all-out tech/English integration. …Affording students tech access more readily would mean that I could be doing so much more here…" (Written wiki reflection, 14 March 2013).

A majority of the participants in this study (8 out of 11, or 73%) discussed their eagerness to implement some form of online student collaboration within their content area for the next school year. The affordances of creating and using online applications, both for themselves as educators and to their students as twenty-first century learners, will be discussed in the following section. Using technology with students—seeing

student engagement and success—emerged in the data as a strong motivational factor for teachers who were learning new technologies.

Motivation and Guidance for Teachers as Learners

A last research question was added after the first two data analysis cycles: 5) How do practicing teachers learn new online applications? What motivates teachers to learn new technologies? At first seen as a possible key factor which was part of RQ #2, the topic of motivation and guidance eventually became a separate entity within the data. Motivational factors were not always seen as barriers or enhancements, encouraging or hindering participants when attempting to meet the pedagogical goal of increasing student reading skills. Rather, learner motivation and specific characteristics of teachers-as-learners became more delineated during the process of analyzing types of guidance and instructional techniques that I had used during the professional development course.

In this section, I will first discuss specific findings as they emerged during the separate qualitative and quantitative data analyses. I will then explain the data consolidation process and the resulting tables. Table 5.5 is a summarization of the findings related to motivation and guidance. Figure 5.2 illustrates a continuum for the schema I defined as teachers-as-learners. Following the tables, subsections about (1) why teachers learn, (2) how teachers learn, (3) technology mastery, and (4) the need for differentiated guidance will provide additional insight into this topic of teachers-as-learners which emerged from the data.

Findings from Qualitative and Quantitative Analyses

Questions about teachers-as-learners and possibly inter-connected motivational factors surfaced throughout my notes written during the first two cycles of the study. For example, after completing the CCSS survey and summary activity with the entire group, I questioned the survey's value as a professional development instructional tool. While some participants were interested in the whole-group discussion about the CCSS survey, some others appear to be "turned off" or "tuned out" during the discussion. I wrote in my notes:

> I think that I pushed [some of] them too far tonight. Xxxx and Yyyy seemed way out of their comfort zone. Not ready to think about the big picture? Zzzzz: "So how does this apply to me?? … Next time, maybe try this on an individual basis only. Lost too many; [they] didn't seem to make the connections [between CCSS and new literacies]" (Instructor reflection, 30 January 2013).

I had assumed that the alignment to the CCSS would be a motivational factor for the participants, but after conducting the activity, I was not sure if the activity was motivating for all of the participants. Seen in the reflection above, some seemed to only want to focus on what applied to them in their situation and get back to work on their computers; they didn't seem to value the whole-group discussion and listening to others. Or, were other factors affecting participant engagement during the activity, such as only a partial understanding of new literacies? There was one participant, Summer, who mentioned the CCSS activity as one of the motivating factors that shifted her thinking during the workshop towards her increased use of digital literacies with her students. But, she was the exception.

Using a point system during the workshop in connection with the quests, or online workshop activities, also provided conflicting perspectives in regard to motivational factors. I had intended the quests and the grading rubric (Appendix F) to provide a unique instructional model for the participants, offering a differentiated learning approach for possible student motivation and engagement. While some commented on the motivational benefit connected to the quests, a few participants did not see it this way. Aaren referred to the system as "point grubbing" (Written wiki reflection, 30 January 2013). Another participant reflection mentioned similar concerns: "This class is difficult for me only because I am struggling how to gain my points. Hopefully I will learn as I go" (Olivia, workshop wiki reflection, 28 January 2013). These comments, along with others, led me to drop the point system during the middle sessions of the workshop. Instead of the point system, I worked with individual participants or teams to organize goals for completing their projects and the course. But as a researcher, I continued to wonder about possible motivational factors related to these observations.

Quantitative Data Analysis. I started exploring the question of teacher motivation during the second data collection and analysis cycle which started mid-way through the professional development course. During this cycle, I collected quantitative data from the wiki revision history: counting the number of revisions and edits, comparing the number of in-class entries to the number of out-of-class entries, and counting which participants kept regular reflection journals. During this cycle I separated the four participants with more experience from the seven participants with less experience, using the information from the self-rated pre-workshop survey, and created Data Matrix # 3: Practice Time on the Workshop Wiki (See example in Appendix I). For clarification and

discussion purposes, I distilled these key findings from the data matrix into Table 5.4. To calculate the percentage of revisions completed outside of class, I divided the number of out-of-class revisions—those made by the participants outside of workshop sessions—by the total number of revisions made on the workshop wiki. Numbers were derived from dates recorded in the wiki revision history.

Table 5.4
Participant Time on Workshop Wiki

Participants	Participant Points Recorded on Wiki	Total Revisions on Wiki	OC** Revisions	% of OC Revisions	Kept online journal	Other comments
*Exp A	0	59	5	8%	yes	Made all revisions during first session, except for reflection journal entries
Exp B	845	54	14	26%	yes	
Exp C	450	35	2	6%	yes	
Exp D	1275	67	6	9%	yes	
Exp. Average				**12%**	**100 %**	
*Beg A	1125	158	21	13%	yes	Had student teacher
Beg B	1005	121	50	41%	yes	Made no revisions to workshop wiki during first session.
Beg C	85	11	0	0%	no	
Beg D	25	34	2	6%	no	Disliked point system
Beg E	255	49	11	22%	no	
Beg F	975	34	5	15%	yes	
Beg G	1010	76	30	39%	yes	Had student teacher
Beg. Average				**19%**	**57%**	

Note. Data for table was collected from individual participant reflection pages from the workshop wiki revision history. Participants are listed in order by total survey scores from pre-workshop survey.
*Exp = participants who had rated themselves as "more experienced" on pre-workshop survey
*Beg = participants who had rated themselves as "beginners" on pre-workshop survey.
** OC = Out of Class. Revisions were completed outside of workshop sessions.

There appeared to be no relationship between technology levels and those who chose to record their points from the workshop activities; some more experienced technology teachers enjoyed tracking their points and some of the teachers with beginning skills also enjoyed tracking their points. The reverse was also true: both levels

of experience were represented by teachers who chose not to track their points. Because the expectation to complete the point system was dropped, I could not draw conclusive evidence from this information, but I did find it interesting that about half of the teachers continued the point system for their own reflection purposes. Some of the teachers appeared to be motivated by keeping track of their progress; several shouted out their total points in a competitive manner during the beginning of the last session (Researcher Notes, 16 March 2013).

Data collected from counting the total number of revisions on the workshop wiki were also inconclusive. Because not all activities for the course were contained within the boundaries of the one workshop wiki, the number of revisions did not accurately measure the amount of participant work. The teachers with more expertise moved quickly to their projects and appeared to not need the practice time on the workshop wiki, although all of them continued to write reflections on their individual wiki pages. Some of the teachers with beginning technology skills also moved quickly to their own personal wiki projects.

All four of the teachers with more technology experience continued to write in their reflective journals on a regular basis throughout the workshop, even those who chose not to record their points. It was interesting to note that only half (57% or four of the seven) teachers with beginning skills chose to keep a reflective journal. While continuing the written reflections was highly encouraged and part of the quest activities, this activity was not required to pass the course. I did not ask the three participants about their reasons for not keeping online journals during the follow-up interviews. I did make note that Lauren (Beginner C), who did no outside work on the workshop wiki and did

not keep a reflection journal, chose to start her own wiki site by the first session of the middle class. She and I also sent regular emails to each other during the weeks that we did not meet together. (Researcher notes, 20 February 2013). gave

Probably the most interesting finding from the wiki revision data was provided by calculating the times and dates of the revisions. This information gave evidence concerning the amount of time that was required for the teachers with less technology experience to gain basic wiki skills as compared to the amount of time required for teachers with more technology experience. This is also represented in Table 5.4. Two of the teachers with beginning technology skills had student teachers during the time of the workshop, so they were able to spend more time during the day exploring the workshop wiki. But even taking that into account, the beginners averaged a higher percentage of out-of-class revisions than the teachers who were experienced technology users, alluding to an increase in the amount of time needed by the beginners to learn the wiki application. The clearest evidence of this was seen between the two participants at the ends of the learning spectrum, again using data from the wiki revision history. Even though one more-experienced participant had not used any type of wiki before the course, she completed all of the wiki basic skills during the first session of the workshop. She started experimenting with her own wiki site on the second night of class. At the other extreme, one of the participants did not make a single revision to the workshop wiki on the first session beyond adding instant messages to the bottom of other participants' pages. But by the second night of class, she had made 22 revisions. She continued to make steady progress throughout the course. She did not have a student teacher, but still made 41% of her revisions on the workshop wiki outside of the workshop sessions as

compared to the average of 12% out-of-class revisions by the more-experienced participants. She regularly entered her reflections on her wiki page. By the end of the course, she had created the beginnings of an interactive student wiki for possible future use.

Overall, after analyzing data collected the wiki revision history, it appeared that motivation to learn the technology was a more important factor than the level of technology background or practice time. If successful, teachers were more motivated to keep working and learning. Writing and responding to each other's reflection journals seemed like a motivating factor; those who did keep journals spent more out-of-class time practicing on the workshop wiki. Keeping track of points, however, only motivated half of the learners: 50% of the teachers with more technology experience (two out of four) and 57% of the teachers with less technology experience (four out of seven). Teachers with beginning technology skills needed much more out-of-class time to practice the skills, especially during the first few weeks of the course.

Qualitative Analysis. Much of the information for the topic of teacher motivation and guidance when learning technology emerged during the analysis of the follow-up interviews. Data revealed opposite and contrasting perspectives: although individual successes were often mentioned, the participants' reasons for their successes were frequently opposite and contrary in relation to the instructional approach used during the professional development workshop. For example, one participant would discuss how the explorative nature of the second session was extremely helpful while a different participant discussed frustrations about the same session, commenting that it was too open-ended and presented too much information without step-by-step instructions. As

another example, contrasting perspectives appeared when discussing the help information found on the application websites:

> As far as the Animoto [website] and all those [other online applications], they were frustrating because the web sites are not the best. The instructions… [I just didn't like them] *Q: So, the idea of a self-help website was really not that helpful for you? That you learned best from another teacher?* A: Exactly. And that's how I am. Now, other people can get on there and do it without any problem, but I need some guidance. (Alyssa, interview, 16 May 2013).

> You know what would be nice for me …is on your wiki page to have an addtional help screen. …so if I want to do something …I could look it up and you would have some directions on how to do that… (Linda, interview, 1 May, 2013).

Others, like Alyssa above, talked about "learning in smaller chunks" and "learning from each other" in smaller steps. In contrast, other participants like Linda talked about enjoying the freedom to choose during the instruction time. After a brief introduction, they enjoyed learning from the help information, albeit that they often wanted more help and guidance than what was available on the different application websites.

Data Consolidation. I completed a data consolidation process (Creswell & Plano Clark, 2011) to guide my thinking into this topic of teachers-as-learners. I started by compiling a list of quotes, summarizations of stories, and reflections for each teacher across all qualitative data sources over the time of the workshop in an effort to maintain the voice of all those who participated in the study. I searched for patterns (Bogdan & Biklen, 2007; Merriam, 1998) in participant reflections (i.e.: "just playing with this really

helped me" or "I need to start out slow and just take baby steps") or similarities in motivational factors, especially during the time when participants were actively engaged in the learning process. Data Matrix #2 (Appendix H) became helpful for this stage of analysis as I had recorded chronologically-ordered comments from the wiki reflection pages and then had grouped the comments by level of technology expertise. While completing the data consolidation process, I labeled the patterns or groupings and organized a schema to guide my understanding (Merriam, 1998). Table 5.5 is a summarization of the findings related to motivation and guidance derived from Data Matrix #4 (Appendix I). Figure 5.2 illustrates a continuum for the schema I labeled as teachers-as-learners. These tables will be used throughout the following discussion involving these themes: (1) motivational factors for why teachers learn, (2) guidance factors for how teachers learn, and (3) characteristics of teachers-as-learners.

Table 5.5
Motivation and Guidance Factors for teachers-as-learners

	# of Incidents coded in data			# of Participants who discuss factor (N = 11)	Example Quotes
	Cycle 1 & 2	Cycle 3	Totals		
Motivation Factors. Teachers were motivated by:					
Using technology to motivate or engage student learning	14	19	33	(9) 80%	*"This is the future. The kids will be more engaged."* Interview *"My students love tech" Interview* *"The kids will be more engaged if I bring more digital experiences to them."* Wiki Reflection
Aligning technology with CCSS standards (i.e., critical reading & writing skills)	17	12	29	(8) 73%	*"I'm able to connect these concepts to my classes."* *""I liked that you talked about how this helps teaching; how this helps kids learn."* Interviews
Teacher productivity (i.e., making paper grading more streamlined)	0	2	2	(2) 18%	
Receiving university credit	0	1	1	(1) 9%	
Collaborating with peers	16	4	20	(8) 73%	*"I love that you are here [tonight at the workshop." Please let me know if you need help"* (IM at bottom of workshop wiki) All participants used workshop wiki to talk to other participants for the first

			month. 73% of participants maintained reflective journals for entire workshop, regularly responding to each other. Three participants created wikis for departmental purposes.

Guidance Needed. Teachers learned best with:			
Description of Learner	Defining characteristics	# of Participants (total of 11 = 100%)	Example Quotes:
Step-by-step instruction	Would prefer to pick and choose what they're ready to learn. *"I have a lot to learn, but I'm always willing to try."* Interview Overcame barriers with one-on-one instructor.	2 Both beginners	*"I got lost and stayed away from the wiki for a while when I got behind what they [my other colleagues] were doing."* Interview *"The new apps were frustrating because the instructions on the web sites are not the best."* Wiki reflection
Working with a peer or team of peers	*" Thanks, Xxxxx, I love having a colleague who wants to work together.* (Workshop wiki, Instant Message) Overcame barriers by seeing others' successes.	4 (2 experienced, 1 intermediate, 1 beginner)	*"So you learn best by watching somebody else and playing with somebody else, and actually getting to practice. And that's how I am."* Interview
Get things done. Hands-on practice with instructor for guidance. How does this apply to my situation?	*"Teachers want something they can actually take out and use and apply immediately."* Interview Overcame barriers by "hands-on" time on the computer.	2 (Both beginners)	*"I'll need little refreshers from time to time of what things mean and where to find things."* Interview *"Teachers don't want fancy lectures. They want something hands-on that they can develop."* Interview
Self-exploration	*"It just takes a lot of tinkering…"* *"I really kind of like how you left it to exploration"* Interview Overcame barriers by asking questions. Enjoyed time to figure things out on their own.	3 (1 intermediate, 2 beginners)	*"What would be really nice on your wiki page would be a help screen where I could look things up."* Interview

Motivational Factors: Why Teachers Learn

The top of Table 5.5 lists possible motivational factors, or *why* teacher participants chose to learn a new technology. These factors were organized into categories derived from the data during the data analyses and consolidation processes. Columns provide information concerning the number of times a motivational factor was

discussed, when it was discussed, and how many participants referred to each category. The categories for motivation included (1) student need or success, (2) dictates from existing curriculum and Core Standards, (3) teacher productivity, and (4) teacher collaboration.

Student Need or Success. A majority (8 out of 11 or 72%) of participants in this study discussed the needs of their students as the main reason to learn new online applications. It appeared that when they saw their students being successful, they were the most motivated to keep learning themselves. Over half referred to student successes when asked what they had personally learned from the workshop. For example, Dale spent fifteen minutes of the twenty-minute-long interview describing his students' success story applying a new online application to a math unit. He reflected upon "getting to actually use [the new application]" as becoming "a learning situation for all of us." Doing the activity "really [got] them thinking deeper about stuff: What do we do with this? How can we organize this? What does this really say? It [had] all of the analytical pieces that you want to start happening… and it [was] powerful stuff for [my students] to work with…" (Interview, 24 April 2013).

Alignment with Curriculum and Standards. Secondly, over half of the teacher participants (7 out of 11 or 64%) discussed the introduction of the Common Core Standards, 21st Century skills, or their own content area curriculum as a motivational reason to learn new applications. Teachers at all technology experience levels discussed this need to "be on board" with technology. As Aaren discussed his future plans, he mentioned this: "Well, I'm going to close out this year and start planning for next year and incorporate as much as I can. …I'm just going to kind of reassess all the items I have

to do in the fall for first semester and see if I can kind of infuse technology. Second semester, I feel like I've kind of done that, with this class, so I'll see what I can do with my first semester curriculum over the summer" (Interview, 16 May 2013). Olivia mentioned her need to incorporate her curriculum with technology as she reflected upon her choice of project: "Yeah. I thought that that would be a good way for me to use [my technology project] within my actual curriculum with the students" (Interview, 8 May 2013).

Other Motivational Factors. The other motivational factors were only briefly mentioned by a few participants. Two of the participants briefly mentioned teacher productivity: certain technology applications might make grading practices more efficient or provide better and faster feedback to students. One participant mentioned the benefit of receiving a credit for the workshop, along with the need to keep up with new information, adding another tool to her toolbox, and "refreshing herself to get more excited about doing the job" (Sharon, Interview, 17 May 2013).

Teacher Collaboration. Collaboration emerged as a large motivational factor for the teachers in this case study. All thirteen of the participants—both administrators and teachers—commented upon the collegiality and the collaborative elements of the workshop wiki during some point of the semester. Beyond the needs of students and curriculum, participants advocated the use of wikis or similar applications for teacher-to-teacher collaboration. Three of the participants started departmental wikis during the semester, which were in addition to their other technology projects. Comments of encouragement between colleagues were highly visible, such as this excerpt from Alyssa's wiki page:

> This is my first Animoto video. I think I deserve an Emmy for it. [Hyperlink to video]. (Alyssa, 2/4/13)
>
> *I expect you will now be picking up everything and moving to L.A. You did an awesome job. It has motivated me to do one! (Linda, 2/15/13)*

Implications connected to these various motivational factors, especially the need for teacher collaboration during the learning process, will be discussed in the next chapter.

Teachers-as-Learners: How Teachers Learn

Along with motivational factors, data revealed interesting results about guidance factors, or *how* teachers learn new technologies. Findings from this study demonstrated that all teachers as learners needed and valued guidance when learning new skills. But the types of guidance greatly varied, depending upon the learner.

Types of Teacher Learners.

Teacher participants in this study were categorized into four types of learners: (1) learners who appreciated step-by-step guidance, (2) team players who enjoyed learning with colleagues, (3) goal-oriented learners who wanted practical applications that would work consistently and with little fuss, and (4) self-explorers who learned best when "tinkering" on their own before discussing new ideas with others (Figure 5.2). Teacher learners new to online applications, the beginners, were represented in all four of the learning categories. The teacher learners who were more experienced with online applications were either categorized as self-explorers or worked with colleagues in teams. They did not appear to need step by step guidance.

Teachers-as-Learners Spectrum			
	Teachers	**Teachers as Learners**	**Mastery**

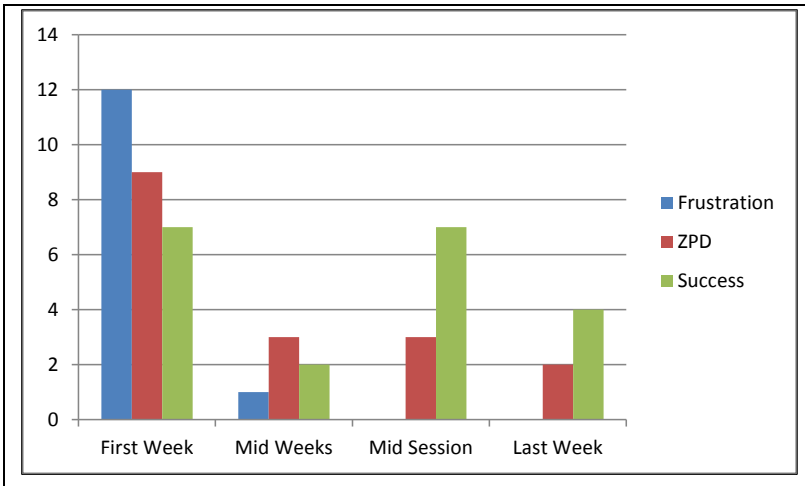
	Resistant to Learning Tech	⟷	**Level**
Number of Participants in study	0	**1. Willing to Learn,** but limited by technology = 2 **2. Team Players** (enjoy working with colleague) = 4 **3. Get R Done** (how does this apply to me?) = 2 **4. Self- Explorers** (learned best by exploring alone) = 3	2
Example Quotes	4 participants talked about colleagues resistant to technology	***1.*** *"I still have a lot to learn. …but I'm always willing to try."* Alyssa **2.** *"Yeah, we've done a lot of planning together."* Amelia **3.** *"Teachers want something they can actually take out and use and apply immediately."* Sharon **4.** *"It just takes a lot of tinkering."* Lauren *"Now it's just a matter of sitting down and playing my way through all of the things that can be done."* Linda	Skill Transferability *"[She] just took it and ran with it."*
Overcoming Barriers	Resistant teachers may use logistical barriers as a reason not to try	Willing to work around barriers. Overcame barriers by seeing success*: "Just to see the success of all those teachers [who were in the workshop].. that was huge."* Summer	Seeing ways to work around barriers
Guidance Needed	*"It's very hard to bring all teachers on board with anything. You know, they get entrenched in what they do. I think that's one of the hardest things is to move forward in a district is to get teachers to buy into a system of change."* Robyn	***1.*** *"If you're back in the fall, make sure you show me how to do the collaboration thing."* Dale ***2. & 4.*** *"I really liked the working session. So, we could go and…. I didn't have to necessarily learn anything new. But I could tinker on the wiki or sit and listen to some talk about Slide Rocket."* Lauren ***3.*** *I'll need little refreshers of what things mean and where to find things."* Aaren ***3.*** *[Teachers] don't want fancy lectures; They want something hands-on that they can develop."* Sharon ***4.*** *"I really like how you kind of left it to exploration."* Olivia	Weighing the Pros & Cons: *"I'm just keeping it in the back of my mind."* Amelia *"That's what was beneficial to me—your welcomed knowledge …If no one else tells you, I don't know how you find out."* Robyn

Figure 5.2. **Teachers-as-Learners spectrum. Comparison of Participant Learning Patterns adapted from Data Matrix #4 (Appendix I). Quotes are coded from follow-up interviews.**

There was evidence of the teachers-as-learners working within their Zone of Proximal Development (Vygotsky, 1986), implying that they were being challenged to learn skills that were completely new to them that stretched their thinking and their learning. Participant comments, written reflections, and dispositions seen by other colleagues defined the four different learning categories. Phrases such as "stretching myself," "struggling through," "attempting to tackle the challenge," "playing my way

through," "gaining confidence," "just tinkering," "she took it and ran with it" or "pushing ourselves through," which throughout all participant written reflections (Appendix I: Data Matrix #2), illustrated the challenge that the participants felt during the learning process. More of this struggle for mastery was seen in the comments of the beginning teachers during the first week of the course (Figure 5.3). However, teachers with more experience also used these terms to describe their learning and their accomplishments.

The Learning Curve. An interesting pattern took place within the comments of the teachers who were beginners with the technology (Figure 5.3). At first, comments coded as "possible fear," "frustration," or "this challenge is too much for me" were seen often. In comparison, only one comment of apparent frustration was coded during the same period of time for those teachers with more experience. Gradually, by the middle sessions, the beginning teacher comments were coded as mostly "hopeful" or "successful." During the middle sessions, more of the experienced teachers reflected



Teachers with Beginning Technology Skills
(n = 7)

Number of coded incidents collected from workshop wiki reflections

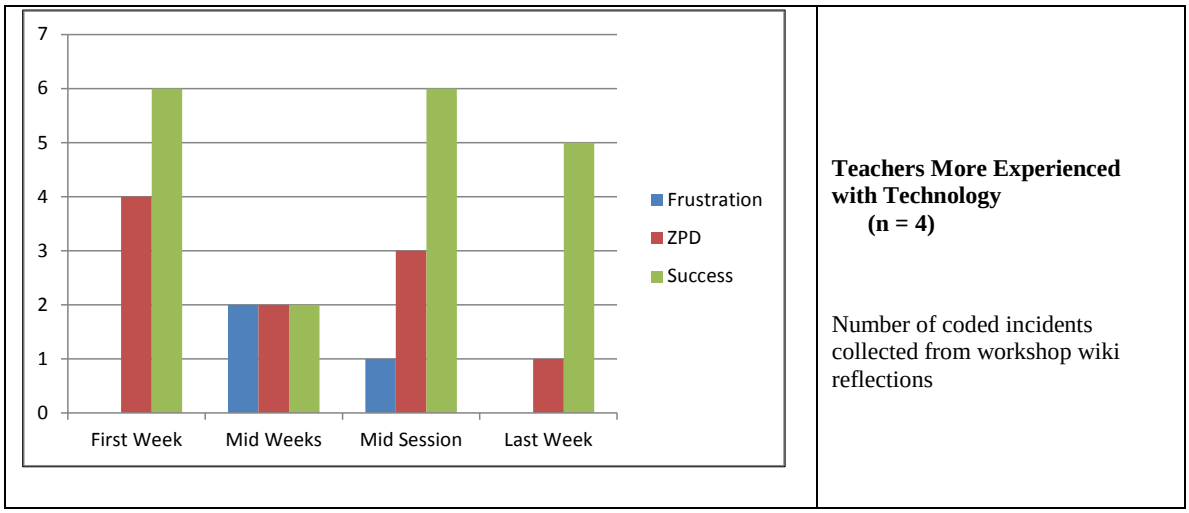


Figure 5.3. **Learning patterns from participant reflections.**

upon frustrations as they had to readjust their original goals for various reasons. By the end of the course, no comments were coded as "frustrations" by either group. Evidence of "struggling" and "stretching" –comments referring to the learning process—were equally recorded by both groups of teachers until the end of the sessions. However, beginner comments about their successes grew considerably. Some examples of these comments: "I was having a hard time… I finally did it, and now I realize it's pretty easy" (Sharon, Reflection, 4 February 2013). "I made progress lately. …Finally I got it up and running on my school computer and expected it to be a difficult tool to use like my other tries. But no, it was easy, fun, and got me excited to use it with my students" (Alyssa, written reflection, 3 March 2013).

Not all participants remained within one specific type of learning characteristic. For example, some moved from self-exploration to more collaborative patterns depending upon the skill or application being learned. The learning pace also differed greatly, both with individuals and with the teams. One team of more-experienced technology users started quickly but slowed to almost a standstill due to compounding

factors. In contrast, one beginning technology user who had made very little progress during the first few sessions, decided to tackle a project involving an interactive wiki page. By the middle sessions she had successfully created the start of her own webpage.

Mastering Technology Skills

Quite early in the data analysis, I had started noticing similarities between two of the participants, Robyn and Amelia, because of similar learning patterns. They both learned new online applications quickly and both chose to work with less-experienced partners, so they were originally placed in the Team Player column of the learning spectrum (Figure 5.2). But they had other similar characteristics that I noted; data collected from these two participants suggested characteristics of a mastery level. Because of these similarities, I added a column to the far right of the data matrix, which I labeled as Mastery Level (Figure 5.2). During Cycle Three and the follow-up interviews, I learned that both Robyn and Amelia had successfully used online applications with students prior to this study. Robyn had come from another state where her students had had full-time use of computers and access to the Internet in her classroom. Amelia had taken university courses and had experimented with a collaborative student wiki at Hawk Bluff two years prior to this current study. It appeared that these past experiences were transferrable as both participants experimented with online applications for different purposes and in different settings. Mastery characteristics included abilities (1) to transfer skills from one application to another, (2) to weigh the pros and cons of new applications and choose the best application for the desired purpose, and (3) to seek ways to work around possible barriers.

Skill Transfer. The ability to transfer skills was generally discussed by participants indirectly. As an example, during her follow-up interview, Amelia casually mentioned her ability to watch the use of the Google surveys and spreadsheets one night during the workshop and then use it in her classroom the next week for an impromptu online survey with her students. She had not included this story in her written reflections or as one of her successes during the interview. In contrast, one of the beginning technology participants spent all of his time learning how to use just one piece of Google Drive for student use and had still not mastered transferring these skills to similar applications or other forms within Google Drive (Researcher notes, 20 February 2013).

As mentioned earlier in the section about reviewing data from the wiki revision history, Robyn learned all of the basic Google Sites skills the first night in just a few hours. She had not tried creating a wiki before the workshop, but was an experienced Moodle user. She wrote about her ability to transfer skills from one application to another in reference to the similarities in making external and internal links between the two applications. Transferability was also described by these participants' colleagues. When referencing her teammate, this ability was described as "just taking an idea and running with it" (Kevyn, Interview, 24 April 2013).

Transferability was also mentioned by other participants in connection to mastery. As one participant learned about wikis, she made this comment:

> "I struggled at first with this idea of wikis, not quite understanding what they were… even the first whole class I didn't quite understand it until… Oh… Okay! And then I'm thinking… I can just apply this to what we're already doing on

> Fusion, so this is not a stretch anymore. It was, to start out with, but not anymore! (Alyssa, interview, 17 May 2013).

After Alyssa was able to make a connection with what she knew about SchoolFusion, the concept of the wiki application made more sense to her and she was able to go forward in her learning.

Choosing Applications for Specific Purposes. Robyn and Amelia also demonstrated a strong capability of measuring the pros and cons of the different applications. Throughout their reflections, they often discussed both sides of the issue as they explained their choices for using certain applications for their projects. They asked questions beyond the basic skills of the tools they were learning during the class sessions (i.e., "Will [this application] be able to…" or "How can [this application] do…" vs. "How do I build a …."). The difference in this questioning was noted in Researcher Notes after a middle session (20 February 2013).

Working Around Barriers. The third characteristic of a mastery level indicated an ability to work around possible barriers. Although all the participants who demonstrated mastery-level characteristics defined within the study reflected upon key factors that caused frustrations when implementing collaborative applications with students, they also demonstrated a desire to "work around" the problems. This was also seen throughout their follow-up interviews. In particular, Robyn and her colleague Kevyn spent a majority of their interview time discussing ways to work around the issues that they were seeing in their school as they reflected upon ways to go forward with technology in their classrooms.

Differentiated Guidance Needed for Teacher Learners

The need for differentiated guidance among all teacher learners emerged as a key finding in this study. The types of guidance were unique to different individuals; however, teachers with similar learning characteristics seemed to prefer similar types of guidance. While the step-by-step learners valued face-to-face coaching in small, incremental sessions, other teacher learners valued time to openly explore by themselves with someone available to answer questions after intervals of self-exploration. In between these, other teacher learners enjoyed collegiate conversations and large, general conversations; in contrast, others appeared uninterested in whole-class conversations and seemed to prefer specific information to take and use for a specific classroom purpose.

Some preferred just a summary of the tools available and then time to explore. One of the more experienced participants commented that she liked "to just keep [all of the different applications] in the back of [her] mind" for possible future use when asked about using a wiki for student collaboration in the future. (Amelia, Interview, 15 May 2013). Another participant commented in her opening reflection that she took the workshop "to simply learn what else is out there and to improve the quality of materials that [she] delivered online" (Robyn, workshop wiki reflection, 30 January 2013). In contrast, some preferred direct, more concrete, step-by-step guidance. Several participants talked about their frustrations when trying to follow online help guides, commenting that the guides were too "open-ended" and were not helpful if key words were not known.

Across the spectrum of learning patterns, however, a need for guidance was a common thread. One more-experienced participant reflected upon what she had learned

during the workshop, summarizing her need for continued guidance from professionals in the field, even after reaching a level of mastery with technology for academic purposes: "… If no one else tells you, I don't know how you find out" (Robyn, Interview, 24 April 2013).

Summary of Results

The eleven teacher participants in this case study reported significant gains in individual growth regarding technology knowledge and skills needed to bring interactive, collaborative applications into their classrooms for student use. Findings suggest the willingness of these participants to overcome potential frustrations and barriers during the learning process, mainly motivated by the successes seen with student learning and the need to align with the new Core Standards. A majority of the participants (8 out of 11 or 73%) maintained online reflective journals throughout the professional development course and corresponded with one another, which was also seen as a motivating factor involving teacher collaboration during the learning process. A majority of the participants (9 out of 11 or 82%) also indicated a desire to continue student online work in the future.

The original pedagogical goal for the workshop—using online applications to increase student critical reading and writing skills—was not achieved by a majority of participants in the study. This was possibly due to inexperience among the teacher participants, as many had not had the opportunity to explore interactive online applications at a personal level before the workshop. However, even teachers with more technology skills proved to need more time than what was allotted for this study to

complete a successful, online collaborative project with their students and objectively measure student growth.

Key factors involving time limitations and technology logistics were explored as possible barriers which may be preventing a smoother transition of collaborative use of the Internet for teachers, like these participants, who were willing to try new innovations in their classrooms.

A third group of findings supported the concept of teachers-as-learners, highlighting the possible motivational factors and the need for differentiated guidance by all teachers during the learning experience. Learning differences were also noted between those teachers who were just beginning with online applications and those teachers with previous experience with online applications. Findings supported characteristics of technology mastery for teachers which included abilities to transfer skills from one application to another, abilities to choose applications for specific purposes, and abilities to find ways to work around technology barriers.

CHAPTER SIX: DISCUSSION AND IMPLICATIONS

This chapter is organized by overall themes posed by the findings discussed in the previous chapter. The themes presented here support existing New Literacies theories and suggest other information of interest for educators who desire to take new literacies skills into public school environments. Findings from this study highlight the complexities of teacher learning in regard to Web 2.0 technologies. Results suggest that there is a multifaceted set of elements that are part of the teacher learning process, including past technology experiences, motivation to learn the technology, and the guidance available for the teachers within a collaborative learning environment.

Themes are organized into three sections: (1) the unique role of teacher-as-learner, (2) overcoming technology barriers, and (3) implications for future professional development models when guiding practicing teachers how to create online student-to-student collaborative environments. The chapter concludes with a discussion of the limitations of this study along with suggestions for the next iteration of research in this area.

Teachers as Learners

One theory implicated in this study connects with teachers-as-learners: assimilating the use of interactive online applications for student collaborative purposes may take a long, concentrated effort for practicing teachers. The three-month course only provided a starting point for the participants with little or no previous experiences with

online applications. Also, there is learning needed beyond the exploration of the technology features; it will take time to shift pedagogical thinking, to what Lankshear and Knobel (2011) call the "ethos stuff," or the culture of collective knowledge building.

First and foremost, it appears that the majority of teacher participants in this study had not had a chance to experience online collaborative applications on a personal level. Even though they were interested and willing, the actual skills involved in creating digital hypertexts with links and images became a huge stretch for them, often pushing them out of their comfort zone. Thus, in this professional development setting, experienced teachers were placed in an unfamiliar position: they were brand-new learners.

New Literacies researchers have discussed this stretch for all learners (Sharpe, et al., 2010). The findings in this study confirm that the unique role of teacher-as-learner must be considered when preparing professional development programs focusing on technology. It is not just the students who are learning. For teachers new to Web 2.0 technologies, being stretched out of their learning comfort zones may be unsettling. While a feeling of disequilibrium should be expected as part of any new learning process, it may be unfamiliar to veteran teachers. Overcoming this discomfort while learning how to build an effective online environment may be the part of the process that will take extra professional development instructional time.

In the past, the role of the professional development instructor became more of a disseminator of new information. This role might be changing as teachers seek to learn not only new instructional techniques but also new skills for the first time. This may be analogous to learning to drive a new vehicle on the freeway for the first time while simultaneously attempting to teach beginning drivers the same skill.

How Teachers Learn

The teacher participants in this case study were willing and dedicated learners, yet the challenge of mastering new skills, such as the online web editing features of a wiki during the first night of class, uncovered frustrations for many. How these teacher participants learned—how they overcame their personal frustrations, how they chose their projects, and what types of guidance they required— became an interesting focal point of this case study.

It appeared that the task of teacher-as-learner added multiple layers to the professional development environment; teachers had to consider themselves as learners (what does this mean to me in connection with my world?) in addition to thinking of themselves as teachers (how does this apply to my students and my instruction?). For a majority of the participants, the learning experience seemed manageable and at some times fun. This was seen as the participants reflected upon their accomplishments while learning various wiki skills:

> Hello! It's Night two and here I am again. Back on the wiki …getting better. (Alyssa, wiki reflection at 6:30 pm, 30 January 2013)

> I'm back in class again. I felt pretty good (better than when I first arrived) at the end of class Monday. At first, I was intimidated due to my lack of computer knowledge, but it ended up being interesting, fun, and not that hard. (Alyssa, wiki reflection at 8:00 pm, 30 January 2013)

> Yea! I am really getting into this. This is so much easier than I thought it was. This could begin to consume me! (Linda, wiki reflection, 13 February 2013)

> Yippeee! … I figured out how to make a subpage. … It is 7 pm and I am still having fun! (Summer, wiki reflection, 28 January 2013)

Despite times of celebration, continued comments that marked frustrations, setbacks, and changes in original plans demonstrated the messiness of the learning process. After scaling back the size and scope of their team's wiki project, Summer wrote: "I have felt very daunted about this class and our project, but … here's to tonight and being productive!!!! Fingers crossed…" (Wiki reflection, 26 February 2013). Several participants noted setbacks. Sharon describes one of her frustrations:

> Got a bit too confident yesterday. Tried to change an icon in the user name bar on our social studies department page and made a mess. After fiddling for 40 minutes I gave up. My intern fixed it in less than five minutes; have to redo my table of contents and links. (Wiki reflection 14 February 2013)

Frustrations like these—as well as the successes—illustrated the multi-layered issues of learning how to teach with the Internet. Teacher participants were used to learning new skills and overcoming challenges when trying innovations in their classrooms; but the online technologies seemed to compound the issues at a faster, more complex pace. While certain skills might come easier to the students who are familiar with the technology, the learning was a challenging process for the teachers. It particularly placed extra burdens on the process of planning instruction as the teachers faced new challenges that they had not experienced before.

Two Ends of the Spectrum. There appeared to be two extremes during the learning process for these participants, forming a teacher-as-learner spectrum (Figure 5.2). On one end, confusion, hesitancy, reticence, and possible resistance were seen

when colleagues had little knowledge or experience. At the other end, even though none of the participants rated themselves as technology experts, there appeared to be a level of expertise that allowed teachers to "run with" an idea after little training or prior practice. Teacher learners who represented the far end of the spectrum, labeled as resistant to technology, were not part of this study. But, many participants in this study did reflect upon colleagues who would fit into this group. For example, when asked about the resistance she had seen among her colleagues, Linda described this resistance as not a fear, but "a misunderstanding of the unknown" (Interview, 1 May 2013). Again, theories about this far end of the spectrum were implied, but not studied at this time.

At the other end of the spectrum, there appeared to be a level of mastery where basic webpage skills learned for one application could transfer to a new application and thus make the learning process simpler. As discussed in Chapter Five, characteristics of mastery included (1) this ability to transfer skills, (2) an ability to weigh the pros and cons of different tools and effectively choose the right application for a specific pedagogical purpose, and (3) the ability to work around issues that might seem as insurmountable barriers to those less experienced with the technology.

In the middle of the spectrum, where a majority of participants in this study were placed as teacher learners, the stages of the learning process were varied for each teacher and the learning pace was different depending upon the task. While some individuals learned a skill quickly, others learning the same skill described it as beating their heads against the proverbial brick wall (Researcher notes, 20 February 2013). The same participant would be "sailing through" something during one session, then hit a spot of frustration a few hours later. In other words, participants followed typical learning

patterns seen when building knowledge about a new skill or concept (Bruner, 1986; Dewey, 1938; Vygotsky, 1986). Also, it seemed that the learning process "evened out the playing field" as teacher participants learned new skills required for the various online applications. At times, the teacher participants with more technology experience learned from the teachers with limited technology skills while exploring an application for the first time. As an example, Google Sites had recently changed the look of a particular setting, taking the experienced user by surprise, but the beginner had learned how to manage that particular setting and taught her more-experienced colleague how to maneuver within the changes (Researcher notes, 20 February 2013).

Teachers as Student Drivers. During the third cycle of data collection and analysis, the old analogy of visualizing the Internet as the Information Highway resurfaced as a way to enhance and illustrate my thoughts about the phenomenon of teacher-as-learner (Appendix I: Data Matrix 4). The four categories of teachers-as-learners were analogous to students taking a Driver's Education course, ranging from those who read the Drivers Manual from cover to cover before stepping into a vehicle to those who preferred to just jump in and drive. During a follow-up interview with one teacher participant with beginning technology skills, I mentioned my thoughts about teacher resistance from this perspective of watching from the sidewalk. I reflected that maybe those teachers who resist technology have not had the opportunity to even "take a ride" to see what the new applications can accomplish. She chuckled and added to my thoughts: "When the car first came out, not everybody jumped in and drove those Model Ts… They were scary, with a lot of power!" (Sharon, Interview, 16 May 2013). From her statement, it appeared that Sharon agreed with my analogy and took it a step further;

not all teachers are willing to "step off the sidewalk" and try out the Web 2.0 technologies—these technologies are still scary and have too much power.

Why Teachers Learn

Motivational factors, or *why* teachers learn new technologies, were also defined within this study. It was not surprising that a majority of these teacher participants, seasoned middle school veterans who had shown qualities of highly-effective teachers in their classrooms (Ted Graham, Interview, 08 May 2013), were motivated to learn innovative ways to use the Internet because of their students. Even those who were still hesitant, "a bit leery," of jumping into student-to-student collaboration discussed their need to learn new technologies for the sake of their students. "I know that this is something that's here to stay. .. got to do it… got to do it…" (Alyssa, Interview, 16 May 2013). "[The workshop] made me think more about how to engage students. I do want to do more with online learning. And, I did! I got a good start with my novel unit" (Sharon, Interview, 17 May 2013).

It was also clear that these teacher participants were motivated to learn how to utilize the Internet more effectively due to the upcoming changes in student learning standards, the curriculum, and the manner in which they would be assessing their students which would require deeper critical reading and writing skills. During follow-up interviews, several participants shared that having "CCSS" in the title of the workshop was what initially motivated them to enroll in the course.

Other Factors. These teacher participants did not seem to be motivated, however, by one of the more traditional reasons to take a professional development course for university credit. Only one teacher mentioned the need for the credit during follow-up

interviews. It could have been that this experienced group was no longer as concerned about obtaining more credits or degrees (although one participant was working on a doctoral degree in her field), or it could have been the open-ended nature of the workshop itself did not provide opportunities to discuss this motivational factor. Several teachers did ask "if they had passed" during the last session of the course, which I confirmed individually when asked. In addition, all participants received an email congratulating them on passing the course. For whatever reason, however, meeting the requirements of the course for credit did not emerge as an important motivational factor during the follow-up interviews.

It should also be mentioned what other factors were not seen within the data of this study. As an example, money issues were not explicitly mentioned within this study. Teachers implied the need for more technology hardware; two of the participants were in the process of writing grants based upon the research they learned during the workshop. Money issues could also be inferred by the comments about not enough technology lab space. However, the lack of money to buy technology was not directly mentioned. The main concerns for these participants seemed to be making room in the curriculum for the technology and the need for professional time to learn how to use the technology.

Administrative support was another factor that emerged as an enhancement for technology implementation in this study, which had not always been seen in my past experiences with professional development work. A majority of the participants in this study praised their administrators for their encouragement and continued support. Participants from two of the schools discussed their appreciation for their administrative support. During interviews from participants in the third school, the issue was just not

discussed. Two of the host school's administrative staff attended workshop sessions when possible, also discussing or researching technology issues for the participants on an individual basis outside of the workshop sessions. One full-time administrator took the course for credit; the other was completing an administrative internship. Both were advocates for technology integration, willingly coaching small groups or individuals in their areas of expertise.

Factors related to teacher motivation when learning new technologies should be explored further in future studies. As teachers shift their thinking and their pedagogical stance to accommodate the Internet for academic purposes, it could possibly be that their reasons for pushing themselves to learn these new, complex skills may be shifting as well.

What Teachers Need to Teach

Beyond *how* the teacher participants learned and the motivations for *why* they learned, another theme surfaced within the findings. Results suggested that teachers must be specifically guided in *what* students need to be taught in regard to Web 2.0 skills and culture. Students need to be moved away from a static listing of knowledge towards a dynamic set of thinking and problem skills that include collaboration with peers in authentic learning tasks. This is new thinking for students and especially for teachers.

Prior to the recent shift to twenty-first century skills, teachers had had personal experiences with Web 1.0 technology and most had been trained with related technologies as they took teacher preparation courses. However, these were digital resources that did not dramatically change every time that they were accessed. Thus, teachers could learn about a new website or software program and adapt it fairly easily

into their curriculum, consistently using the digital resources from year to year. However, with the advent of Web 2.0 resources, this process seems to become more complex. Teachers not only need training with the specific applications but also how the applications apply to student learning. This difference in pedagogical content, or *what* must be taught, may be causing some of the confusion, and thus teacher resistance, when asked to use Internet applications with students. I will discuss this theme and further implications in the next two sections: (1) the fear factor and (2) unboundedness.

The Fear Factor. As I read the participants' instant messaging (IM) banter in the comment sections at the bottom of the workshop wiki pages during the first night's session, I first chuckled at their student-like responses (e.g., Txxxx (owner of page): *"Hey, Lxxxxx. We can do this!"* Oxxx: *"Hey, Lxxxx is the one to copy."* Axxxx: *"[Watch out.] I'm sitting behind all of you."* Oxxxx: *"Good Comment. Perhaps you should teach Lxxxx how to spell.")*

But after the sessions, during the first data analysis process, I noted something else within these colleague-to-colleague comments. Was I seeing a fear factor? (e.g., Sxxxx (owner of page): *"I'm totally out of my element."* Lxxxx: *"This is going to be out of my comfort zone."* Sxxx (owner's reply): *"A great learning curve to be had by me…."*). The term "fear factor" was one that I had used in past professional development experiences to describe a technology phobia towards learning anything to do with computers. Were these teachers with beginning technology skills at a level of frustration that they would not be able to overcome?

By the middle sessions of the workshop, however, there was a definite shift in the emotions seen within the comments on the wiki reflection pages. The excitement of

individual success and the sense of satisfaction and accomplishment began to dominate the conversations, and fewer frustrations were coded in the data (See Figure 5.3). In their place, more statements about "being stretched" or "being hopeful about accomplishing a task" were coded (see also Data Matrix #2, Appendix I). It appeared that these teacher participants did not have a fear of the technology; rather, they were being pushed well out of their comfort zones into an environment that stretched their thinking and learning. The more that they understood how the technology helped support student learning, the more willing they seemed to keep trying it.

By the third data analysis cycle, I labeled these "hopeful-but-challenging" comments as areas of learning within Vygotsky's (1986) Zone of Proximal Development (ZPD). The findings implied that the participants were not working within an area of total frustration and fear, but within an area that was pushing them to learn new skills. It required the hard work and instructor scaffolding, which are part of the assimilation and accommodation processes that are part of Vygotsky's (1986) ZPD learning model. This learning role did not always seem comfortable for these accomplished, professional adults. It was "messier" and not always "comfortable." This level of learning was compounded when trying to learn and teach the new technology at the same time. Lauren alluded to this in her follow-up interview. She reflected how the nature of the Internet had been one of her past fears for taking her students to the computer lab, but how the workshop allowed her to gain confidence over this fear. She discussed still being intimidated when trying her first online project with her students for the workshop, but during her experience with making Wordles with her social studies students, she had

gained the confidence she needed to keep trying new technology applications in the future. She explained:

> You just get into a groove and you know what works, and then to introduce something new …gets tricky. … It's just not as smooth as what I normally do. Because it's new. And I'm not awesome with technology, but the kids are. So, I think that the kids [didn't] even notice [that my teaching] was a bit rougher than I like. … It's just me, personally, probably, that seems less confident. (Interview, 29 April 2013)

Lauren was describing a shift in her planning for pedagogical content. She had to add more to her instructional planning and thinking—not only what she wanted her students to learn as they found connections from the social studies passages they were reading within their Wordles, but also how she was going to adapt her teaching to accommodate the online application. It was "rougher" than she liked, but she was excited to keep trying after her first successful attempt.

Unboundedness: A Unique Perspective on Mastery. Findings did demonstrate a possible level of mastery as teachers learn how to use the Internet for academic purposes. However, this level of expertise or competency may look uniquely different from what was previously perceived as levels of content expertise or skill mastery, and it may not always be comfortable for content area teachers. In the past, educators were encouraged, and were able, to achieve mastery in their content areas and define their pedagogical stance according to the type and difficulty of content taught. This meant that the teachers became the main knowledge providers for their individual classrooms that were limited by information available in printed texts and what the teachers knew in their areas of

expertise. Thus, within these well-established parameters, the teachers were able to provide necessary, age-appropriate boundaries and successfully scaffold a controlled learning environment.

The "unboundedness" (Wallace, 2004) of the Internet, however may be changing this perspective of control, and it may be uncomfortable for teachers even after they have mastered the online skills needed to use collaborative, interactive applications. The Internet provides an avenue for ever-changing information and ever-changing ways of guiding students to gain knowledge and skills. But, as Lauren explained above, teaching on the Internet may be "a bit rougher" than what has been the norm for teaching professionals. For example, every time teachers use the Internet, links that had been reliable sources in the past may have disappeared. Every time they take their students into the computer lab, applications used successfully in the past may have changed or disappeared. If teachers use an interactive application that students have only used for social networking purposes, new guidelines must be explained and expectations must be drawn to shift the students' learning processes to accommodate the application for academic purposes. These new guidelines become an important new part of *what* teachers must teach their students (Sharpe, et al., 2010).

This idea of creating boundaries for students was seen with Robyn and Kevyn who chose to use Moodle for their team project over the more open-ended wiki application. While weighing their choice of applications, one of the huge advantages seen for using Moodle was the closed nature of the online learning environment; it provided a structured management system for the teachers, taking less time to introduce to the students. Olivia also chose the collaborative features of SchoolFusion for the same

reasons. She discussed how technology glitches distracted her students, preventing them from focusing upon the content intended to be taught. In other words, the technology "got in the way" of the important concepts that she wanted her students to learn. She was not against allowing her students to explore new applications, but she was concerned about meeting the learning needs of her students with disabilities in the most effective way possible. She reflected upon the amount of time that it took for her to try an application in all student settings in order to trouble-shoot problems before attempting to teach her students. She commented that her students often became frustrated: "…If I don't have the answers immediately [when the technology glitches], then they're like, 'Why are you teaching me something that you don't know?' …They become over critical [which side-tracks their learning]" (Interview, 8 May 2013). Thus, it was important for her to know the "ins and outs" of an application well, prior to introducing it to her students. She needed to test the boundaries herself in order to effectively guide her students.

Amelia, who had previously tried using a wiki with students, discussed the unbounded nature of the Internet in a different way. During the follow-up interview, she discussed her uncertainty about wikis and if they would be the best tool for her to use for future student collaboration. Her main concern, it seemed, was the amount of time that it took her to teach her students the required guidelines for this open-ended space. She seemed confident that her students could be taught the new boundaries if she guided them, but she still debated if the amount of time that it would take to establish and then maintain the open-ended boundaries of the online learning environment would be the best

way to present her content area material within the short time span allowed within her curriculum restraints.

The issues of control and setting appropriate boundaries within online learning spaces, especially with the middle-school student population represented in this study, were legitimate concerns which must be addressed when contemplating the effective use of online applications for student collaborative learning. This study implied that the unbounded nature of the Internet may be the new "fear factor" for the 2010s, causing important concerns to surface. These concerns need to be addressed as part of future professional development courses designed to integrate the use of online applications.

Implications for Professional Development

Findings in this study confirmed that the implementation of twenty-first century technology into existing school systems may not transition smoothly. Specifically, professional development needs to be organized in ways to accommodate the wide range of teacher-as-learner variables. There is no "one answer" to help teachers prepare to teach new literacies skills, no training where "one size will fit all." It is apparent, then, that successful professional development programs must approach teacher learning from a differentiated perspective.

Who is the Expert?

In more traditional professional development models used over the past two decades, an expert was invited to come in for a few hours, preach a specific message, "pump up" the teachers to try something new, and then the teachers would be able adapt the new strategy within individual classrooms. As expected, and as reported throughout

current professional development research (Belanca & Brandt, 2005; DuFour, Eaker, & DuFour, 2005), this traditional approach seemed to clash when introducing teachers to online collaborative applications for academic purposes. I kept asking myself, as I continued to reread through my researcher notes and memos, *who is the expert?*

Several teacher participants expressed their gratification for my personal expertise throughout the workshop course, especially in reference to the new literacies instructional skills connected with reading comprehension. As an example, Robyn explained that the information about online reading comprehension "really forced her to think" about shifting her instruction concerning informational text and digital reading. (Interview, 24 April 2013). But, it did not seem that my expertise always translated into useful information that reached the needs of these teachers who faced many unique challenges. I was the expert in regard to digital literacy, and my expertise was appreciated. But there was another part to the expertise equation: each teacher brought his or her own unique expertise regarding core content knowledge, curriculum and pedagogical expertise with students at his or her grade level. As the professional development instructor, I needed to find ways for my expertise to mesh with the teachers who were the experts with their students and their content areas. While building an environment of respect and trust, I also had to be constantly searching for new ways to explain, demonstrate, and share ideas with them in order to encourage their pedagogical thinking to stretch in new directions.

I believe that not all the participants in this study were ready to accommodate the large shift to a New Literacies perspective within their pedagogical practices. Few participants mastered a good understanding of new literacies instruction, particularly the participatory learning practices that students require (Lankshear & Knobel, 2011) to

increase higher level thinking, communication skills, and deeper understanding of the texts (Coiro, 2003). Also part of new literacies skills, student readers must be allowed opportunities for self-directed text construction as part of the learning process (Coiro & Dobler, 2007).

My assumptions were derived from the fact that few of the course projects reflected a New Literacies perspective. It seemed that many participants still needed to focus (or chose to focus) on the online applications' bells and whistles as they learned how to create text and navigate with new applications rather than the actual instructional process that was afforded by the new applications. They were focused on the tool that they were learning rather than on how the tool would help their students think deeper and respond more critically. But maybe this was the right amount of progress for the participants who had not experienced the participatory nature of the Web; they described the leap they were taking as "huge" and "eye-opening." The phrase "I'm taking baby steps," repeated by several participants throughout the intervention and interviews, is probably a good explanation for the amount of time and practice it will take for much of the New Literacies theoretical underpinnings to filter into public K-12 educational settings.

Using PLCs for Learning Technology

The theme of differentiated guidance and honoring the uniqueness of each teacher learner when attempting to adapt a new technology skill for the classroom can be seen as a common thread within the professional development model often called professional learning communities, or PLCs. Using PLC time to initiate conversations about technology was a positive solution that a majority of teacher participants in this study

discussed as a way of continuing their learning. Little bits of learning over longer periods of time, as suggested within the PLC model, matched the guidance needed by many of the participants. During the follow-up interviews, I asked participants if they thought that a course similar to this one could be taught during PLC time. There were positive responses to this idea, provided that the technology instruction could be "toned down" (Amelia, Interview 15 May 2013), and presented in "smaller pieces over two or three sessions" (Ted, Interview, 1 May 2013). This was described by Aaren: "Well, I'll tell you, you lose sight of what the things are. You hear about Moodle or Prezi, but then, who knows. After this summer my mind could be totally melted and I won't remember any of this stuff again. So, just little refreshers of what things mean and where to find references on the Web of all these things— that would be all I think people would need. …Yeah. The PLC model would be perfect for it. I think it's a perfect fit" (Interview, 16 May 2013).

Findings implicated that after basic skills were mastered, a majority of teachers would benefit from learning technology within the framework of a professional learning community. This would include teachers who could be considered to have mastered technology skills. As Robyn explained, there is always a need to know what is available and what has changed, and to hear it from technology experts: "If no one tells you [about the new literacies research like online reading comprehension skills], I don't know how you find out" (Interview, 26 April 2013).

However, there did seem to be a point where teachers with little or no experience with the new collaborative applications may not be able to pick up needed skills within the time limitations of a PLC model. It appears that teachers with beginning skills would

benefit from more extensive training, such as a semester-long course devoted to just practicing peer-to-peer collaboration in an online learning space. Findings that emerged from the data involving the teachers with beginning technology skills indicated that there was a need for successfully learning about the potential of the online collaborative world on a personal level before attempting to integrate it into their instruction. As an example, in her follow-up interview, Alyssa discussed that she would like to take a professional development course where she could "actually role play as a student" on an online collaborative site, and then smiled and commented, "you're probably doing that already with the pre-service teachers, right?" She then added that the actual personal use of the applications is where many of her colleagues also needed to start, "…just sitting down and doing it. Actually getting more hands-on practice" (Follow-up interview, 16 May 2013). Other participants also commented on the benefits of learning from each other. Allowing for teacher collaboration during the learning process was noted as a strength of this workshop, and should be considered in other future professional workshops in the future as well.

There was also a clear directive for future workshops to be differentiated to meet the individual needs of the teacher learners. Differences in the participant's learning preferences, as well as unique factors that motivated their individualistic learning processes, clearly demonstrated that one type of professional development will not work for all teachers when learning new technology skills. While most participants moved in and out of small-group discussions or collaborative team work, a few participants spent an entire four-hour session focused on one specific application and chose not to join the small-group discussions (Researcher notes, 20 February 2013). And, as noted earlier, the

gains that each participant made were individualistic in nature; every teacher participant came to the learning environment with different levels of skills and past experience. As an example of this, I had initially assumed that the teacher participants would be more familiar with the features available in Google Drive (which had recently changed name from Google Docs) and had not planned on specifically spending instructional time teaching this collaborative online application. In my reflections written after this session, I wrote about one participant, Dale, whose eyes "lit up" for the first time when he saw the capabilities of the Google Drive spreadsheet (Researcher Notes, 1/30/2013). He focused his attention on one Google Drive application for the entire workshop, successfully completing a project for his students using a Google spreadsheet. In his follow-up interview, he expressed his pleasure with his individual progress and was still interested in learning more about applications for student-to-student collaboration in the near future.

The use of the Internet within content area classrooms may provide additional challenges for classroom teachers and shifts in traditional professional development programs will be needed to accommodate needed twenty-first century skills (Belanca & Brandt, 2005; DuFour, Eaker, & DuFour, 2005; Wallace, 2004). Even for teachers who are willing volunteers, such as the participants in this study, hesitancies were seen at both ends of the experience level when asked what things would look like over the next few years. Findings from this study confirmed that teacher learners have varied and diversified needs, especially when utilizing new online applications for academic purposes.

Limitations of This Study

This study examined the introduction and use of interactive, collaborative applications with practicing teachers who were already advocates of technology integration. This small group of already-motivated participants must be considered as a limitation of this study, along with the limitations of the instructor-generated, self-reporting survey used to measure significant gains. However, the participant sample was intentionally chosen and the survey instrument was specifically constructed in alignment with the research questions in order to gain an understanding of the phenomenon being studied. I also carefully considered the potential limitations throughout the planning and implementation of the case study. During this iteration of my research, I sought to collect and study the perceptions of teachers who were willing to learn about collaborative applications before moving to a research project with a more general population of public school teachers.

Research Sample Size

Limitations due to a small sample size must be taken into consideration for other reasons as well. While the focus upon a homogenized group of practicing teachers within one district at one age level provided strength in the capabilities of using a within-sample t-test for quantitative analysis, the same strength also provided inherent weaknesses. For example, the small sample size may limit the generalizability of the themes to a broader population. Gathering data from a larger population of practicing teachers will undoubtedly affect information at both ends of the learning spectrum seen within this study – both those who whole-heartedly support the use of the Internet for academic purposes and those who claim the use of the Internet in the classroom is hampering

students' abilities to read complex texts and develop academic writing skills. And, although there did prove to be significant gain within the small sample size, the gain may be dissimilar if the same intervention had been tried with a larger population.

Bias of Embedded Researcher and Instructor

Throughout the design and implementation of this study, the compounded and inherent biases of my dual role—that of researcher and instructor—had to be constantly taken into consideration. This dual role could have been problematic at many levels. The main concern is the lack of objectivity; however, this type of pragmatist-based research (Greene, et al., 1989) is "inherently exploratory and speculative" (Herrington, et al., 2007, p. 4096). Also inherent within qualitative research, the researcher's past experiences and dispositions toward certain participant behaviors may color, and possibly cloud, the ability of the researcher to analyze the phenomenon being studied in a clear, un-biased manner.

Also, my dual role as instructor and researcher could have affected the candidness of the participants' comments during the follow-up interviews; they may not have felt comfortable to freely share their concerns or true feelings towards technology with their course instructor. To counter-balance possible issues related to this, I did not start the interviews until after the course was completed and all participants had received passing grades and credit for completing the course. I had planned for the course to end before spring break and did not start interviewing until a week after the break. I also planned open-ended interview questions which purposely moved conversations away from the actual work in the course and towards broader reflections about technology in general.

Researcher bias can be compounded when choosing to use mixed methods. As suggested by Creswell and Plano Clark (2011), measures were followed throughout the study to alleviate these issues. I chose a parallel mixed method so that I could analyze the quantitative data by traditional quantitative procedures and analyze the qualitative data by traditional qualitative procedures before converging the analyzed data. The trustworthiness of the qualitative data was validated with two separate inter-rater reliability audits at two different times of qualitative data collection and analysis. Participants also provided feedback and member checking after the interviews were transcribed to ensure clarity of content.

Closing Remarks

During this mixed methods study, eleven veteran teacher participants, with an overall average of fifteen years of teaching experience, offered honest insight into taking the theories of New Literacies into the day-to-day pedagogical practice of three public middle schools. While staying focused upon an intended pedagogical goal of increasing student reading and writing skills that would incorporate critical thinking skills when considering information from multiple texts, including the hypertexts of the Internet, teachers were guided to design and create interactive, collaborative online learning spaces for their students.

A majority of the teacher participants were unable to reach this intended pedagogical goal during the time frame of this study. However, according to written reflections, quantitative scores on self-rated surveys, and follow-up conversations, a majority did succeed in making progress toward this goal while significantly increasing

their personal technology knowledge and skills. A majority of the participants did show positive support towards their continued use of interactive applications on the Internet.

Key factors emerged as possible barriers to the teacher learning process, especially barriers related to time within the public school environment and logistical barriers encountered when introducing new applications within existing networking systems. A majority of the participants discussed ways to work around these barriers, but acknowledged frustrations seen because of these factors. Participants appeared to be motivated to learn new technologies to meet the needs of the students as well as fulfill the requirements to align with the Common Core standards.

A majority of the participants favored learning future technology skills within a professional learning community (PLC) framework, which had already been established at the three schools represented in this study. Yet, hesitation and possible problems were seen, especially for teachers who have limited online technology skills or experience. Participants discussed their awareness of continued teacher resistance towards technology within their schools. Barriers, seen by these participants as things that could be worked around, still appeared to be obstacles for many of their colleagues.

Teacher participants reported the need for constant guidance and help as they navigated this new learning environment for their students. At the same time, they also clarified the need for differentiated, interactive, collaborative instruction; the complexities of learning new skills while simultaneously learning how to teach the new skills added extra layers of challenges to the professional development process. It was apparent that teachers will require a highly flexible, long-term professional development

model if satisfactory progress is to be made within the area of developing new technology skills in public school settings.

Areas for Future Research

One area not researched in this study was that of teachers who are possibly resistant to technology. Again, all of the teachers in this study were willing learners and demonstrated strong determination to learn challenging new skills. Even with this extra determination, the learning process was described as frustrating, confusing, and daunting by the participants. This leaves many unanswered questions: If it is this hard to learn for those who are eager to embrace new technologies, what happens when more-hesitant teachers try to learn? What will encourage the majority of practicing teachers to try new technologies? Is it possible to reduce the amount of teacher resistance, or is this just the usual upheaval seen when new instructional methods clash against the more traditional methods?

Continued Use of Survey Tools. Both the professional development intervention and the survey used to measure results demonstrated strengths that should be considered in future research studies regarding technology in K-12 educational settings. The pre-/post- workshop survey created for this study, *All the Right Stuff* (Appendix B), provided positive and perhaps significant results within the scope of limited participant numbers. It would be interesting to use the same survey on a larger scale, separating the pre- and post-survey assessments over a longer period of time, and using similar interventions for increasing teacher understanding and skills needed to create and implement interactive, collaborative applications for student use.

It is important to note which of the original survey items did not prove reliable within the scalability test conducted during the study (Appendix C). First, the item about online gaming experience was removed before any quantitative analysis was completed. The scores for that item were extremely low even after the intervention (30% or three out of ten participants reported a score of 0 — (0 = No Knowledge. I have very little interest or no need). This was the only item that received any "0s" on the post survey. I had experienced this reaction to online gaming within literacy education before this current study (Nadelson, et al., 2011). It appears that there may be a greater level of resistance to this topic, but that is beyond the scope of this study.

The other item that was not scalable was Item #5: using Social Networking devices or apps (such as Facebook or MySpace) for academic purposes. It was not rated too much differently on the post survey; 70% (seven out of ten) rated that they had adequate experience or very experienced with this item, and no one rated it as a "0" or had no interest. Again, the low sample number does not allow definitive answers, but my intuitive guess is that the term "Social Networking" was perceived in a negative manner on the pre-survey. It would be my recommendation to remove this item if the survey is utilized in future research.

Along with the pre/post survey created, the Common Core State Standards alignment activity proved to have future potential. One participant, Summer, did take the tool and try it with her content area team, with limited results. She enjoyed the tool on a personal level, and felt that it was extremely helpful for her as she worked on an all-district committee to implement the Core Standards within her content area. But, she received a fairly neutral, uninterested response towards the tool when she tried it with her

colleagues, whom she described as more traditional teachers. Even within this study, the holistic perspective the tool provided may have been too large of view for some of the participants. The highest potential of the CCSS alignment tool may be for further New Literacies research in K-12 settings.

Implications for Further Research. After reviewing the results of this research project, I was encouraged to consider conducting a similar study in the near future. The tools, created for both data collection and for creating learning connections for practicing teachers, seemed to have worked well within the parameters of the limited participant sample. The mixed methods design, allowing consistent collection and analysis of both quantitative and qualitative data over time, also demonstrated to be a good fit. The pedagogical goal of increasing student reading and writing skills by using collaborative applications also affords motivation and a sense of purpose for both the teacher learners and the instructor. And, as seen in this study, it will take time and continued guidance for many teachers to achieve this goal.

I would change the intervention slightly, particularly during the first weeks' sessions, to better accommodate the teachers who have not previously explored online applications. I would also differentiate the guidance levels to accommodate more experienced learners who prefer to work at a self-directed pace. With a few alterations, the workshop wiki used in this intervention could easily be modified to accommodate all of these different learning needs. The workshop wiki demonstrated great potential in two ways: (1) it provided a means for teachers to experience the successes and benefits of an online, collaborative learning environment on a personal level, and (2) it provided a

mechanism to collect large quantities of data organized by date, participant, and order in which the content was created, all behind the scenes.

As suggested by some of the participants, it would be interesting to hold the course over a longer period of time, and possibly within an existing professional learning community interested in creating online learning environments for their students. New difficulties may arise for the instructor, however, as enrolling for university credit was not allowed during the current PLCs, at least for this study's district. The issue of receiving credit was not shown as a highly motivating factor for the teachers in this study, but should still be taken into consideration. A possible way of working around this difficulty would be to invite a district-level professional development coach to try a similar intervention within a PLC framework. Then, the researcher could study the perceptions and gains of the participating teachers from a more distant, possibly more objective, viewpoint.

A Final Reflection. Amelia Tan's final reflection on her workshop wiki page sums up many of the implications discussed throughout this dissertation in regard to shifting her role as a teacher in a twenty-first century classroom:

> Being a language arts teacher, reading comprehension is a huge part of what I do on a daily basis. I am constantly worrying about how to help my students be able to understand how to read poetry, plays, complicated novels, etc. I can see from where we are headed that I will also need to worry about how to teach my kids to read digital information. I'm excited about the possibilities, but also daunted by the hugeness of it all. In reading information on the web, I was pleased to see that what needs to be taught are things that I've known needed to be taught. Students

> need to understand how to critically analyze the information they read and see online, not just take it as truth because it is available. One of the challenges that I saw in the information is the idea that there is no common format for information on the web. It can be very different depending on who creates it and the time it was created. So it is a constant learning curve and we really need to be up to date. Challenging. Challenging. Challenging. (Wiki reflection, 16 March 2013).

As a long-time professional development instructor, and now in my new role as an educational technology researcher, I concur with Amelia. The online world provides unlimited learning possibilities, both for teachers and their students. The possibilities are exciting, but sometimes daunting and often challenging. It will be a constant learning curve for both professional development instructors and classroom teachers as they learn to navigate the Internet with students in order to provide an online learning environment for critical reading and writing instruction.

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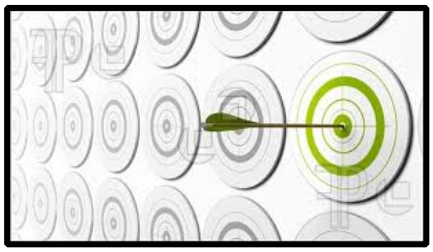
APPENDIX A

Workshop Announcement: Navigating the CCSS in Cyberspace

Developing Digital Communication and Collaboration Skills for Classroom Use



Be prepared to roll up your sleeves and dive in to the world of Web 2.0 technologies as they apply to your role as a teacher of 21st century learners!

Instructor: Meleah McCulley

Credit hours: Participant choice:

- 1 workshop credit hour (LTCY 533) for $60
- Or 1 university credit for $212

Course Description: Teachers will gain hands-on knowledge and skills concerning a large variety of digital applications to use for student researching, reading, writing, collaborating, and presenting. This course is aligned with the Common Core State Standards (CCSS) and will focus increasing students' critical reading skills.

For: Teachers (7th - 12th grades) who are transitioning to the *Common Core State Standards*

Dates and Times: 1st week: January 28th and January 30th, 3:30 – 7:30
2nd session: small-group meetings, after school. 3:30 – 5:00. Dates will vary.
Suggested days: Feb. 20th or March 6th
Last week: March 18th, 3:30 – 7:30

Place**:** Hawk Bluff Jr. High

Course Objectives:

The Common Core State Standards lay out a vision of what it means to be a literate person in the twenty-first century, calling for an integrated model of literacy with an emphasis on literacy in all content areas, group projects and increasing attention to presentation skills. This workshop will encourage teachers to integrate digital literacy skills to meet this CCSS vision.

Teachers will:

- Connect current research-based digital literacy practices and tools with the CCSS and apply digital literacy practices and tools to classroom instructional practices.
- Explore a variety of Web 2.0 tools and discuss how specific tools fit specific Common Cores Standards. (Web 2.0 tools will include: wiki websites, educational blogging sites, VoiceThread, Prezi, Animoto, OneNote, EverNote, LiveBinders, DropBox, and others.)
- Choose specific applications that align and complement existing curriculum or instructional routines, using these tools to design motivating and engaging digital learning environments for students.
- Measure student progress towards meeting CCSS anchor and grade-specific literacy standards, as outlined within different content areas.
- Explore the participatory nature of digital applications at different collaborative levels: teacher-to-teacher, teacher-to-student, and student-to-student.

Requirements:

Over the 3-month course, you will be guided in choosing and applying at least one digital application to adapt for your classroom use. You will receive credit for the workshop at the completion of your project, which you may extend beyond the 3-month time frame.

Mrs. McCulley is a doctoral candidate at BSU, currently completing her dissertation in the field of digital literacy. She is a veteran classroom teacher as well as experienced instructor for professional development courses in the field of educational technology. If you have specific questions about the workshop, contact her by email: meleahmcculley@boisestate.edu

APPENDIX B

Teacher Technology Self-Rating Survey

All the Right Stuff

Before launching your classroom into Cyberspace, it's important to make sure that you have the right tools needed for your journey. Just like the Apollo astronauts, you need to ask yourself if you have *All the Right Stuff.*

This technology survey will guide you to ask questions about your previous technology experiences and skills as you plan your journey over the next few months during this workshop: 1) what is your best destination—a trip to the moon or a one-orbit test drive? 2) What size and shape of vehicle should you test drive? 3) What tools do you need to guide your way and repair possible breakdowns?

While taking this survey, you'll be guided to think about your classroom preferences, your teaching experiences, and your technology skill levels. This information will allow you to measure yourself for Cyberspace tools that will be the best fit.

Specific Survey items:

Tech Knowledge

Directions: Click on the number that best fits your knowledge level for the following topics.

Scale: 0 = No knowledge. I have very little interest or no need.
1 = No knowledge. However, I've heard of this and I'm interested.
2 = Limited Knowledge Level. I've explored this once or twice, but I don't have enough knowledge to work on my own.
3 = Adequate Knowledge Level. I have a proficient level of knowledge. I just need more time and more practice.
4 = Strong Knowledge Level. I can explain or teach this to colleagues and to my students.

Tech Knowledge Items:

K1: Using Learning Management Systems
K2: Taking digital notes while reading digital texts
K3: Using hardware and/or digital tools for instructional purposes
K4: Designing, Editing, and managing websites
K5: Using online interactive websites for instructional purposes
K6: Creating and managing blogs
K7: Using online storage systems
K8: Using online collaboration with students
K9: Creating digital projects or presentations that can be viewed via the Internet

Tech Experiences or Skills

In this section, rate your experiences with the various items listed in the table below.

Use this rating scale:

0 = No experience and not interested.
1 = No experience but interested in learning more.

2 = Limited experience. (I've used this rarely -maybe three times during the last 2 years- either with students or for professional purposes)
3 = Adequate experience. (I use this occasionally -maybe once or twice a semester - either with students or for professional purposes)
4 = Experienced. (I use this regularly - once or twice a week - either with students or for professional purposes)

Experience with online devices or apps like:

E1: Google Drive (formerly Google Docs)
E2: Mobile devices: (ex: iPads, iPods, SmartPhones, Tablets)
E3: Wikis (such as Google Sites, WikiSpaces, PBWiki)
E4: Blogs (such as EduBlog, KidsBlog)
E5: Social Networking for Academic Purposes (examples: FaceBook, MySpaces)
E6: Cloud Storage Devices (Examples: DropBox, LiveBinders, Diigo, Delicious, Mendeley, Evernote)
E7: E-readers, e-zines, or e-books
E8: Apps that incorporate multimedia or hypertext (like: Dipity, Prezi, Animoto, StoryBird, VoiceThread)
E9: Online Databases (LiLI, ERIC, other e-libraries)

Section 4, Pre-Workshop Survey:

Tech Preferences

This last section assesses your instructional preferences when using technology with students. There are no right or wrong answers. You may only make one choice from the drop-down menu under each question. If you mark "Other," or want to add more information, please use the comment box under each question.

1. When presenting new skills or materials, I prefer:
   - Student-centered strategies (Examples: Jigsaw activites, Stations/Centers, Independent Research)
   - Whole-class instructional strategies (Examples: Lectures with PowerPoint, whole-class interactive SmartBoard activities)
   - My preferences vary, depending upon the content or skills being taught.
   - Other. (Add details in Comment Box)

2. When teaching new skills that involve student use of computers, I prefer:
   - Using the computer lab
   - Allowing a few (3-5) students to work in the back of my classroom
   - I'm comfortable in either setting
   - I'm NOT comfortable teaching new computer skills to students
   - Other. (Add details in Comment Box)

3. When guiding my students to research information on the Internet,
   - I do not allow them to use Wikipedia. It is not reliable source.
   - I do not allow them to use Wikipedia. It is not rigorous enough for my content area or grade level.
   - I allow them to use Wikipedia with the same limitations that I use for all encyclopedias.
   - Other. (Add details in Comment Box)

4. I prefer to maintain a high standard of academic writing skills .....
   - in all writing situations. Even journals or notes need to follow Standard English rules.
   - in most writing situations and for most homework assignments.
   - only on final drafts of completed projects or on essay questions.
   - Other (Add details in Comment Box)

5. When collaborating with colleagues on professional projects, I prefer
   - Face-to-face meetings
   - Online meetings (Examples: using Skype, Google Hangout, Google Docs, written conversations in a Wiki)
   - I am comfortable with either one, depending upon the type of information or content.
   - Other (Add details in Comment Box)

6. When instructing students, I prefer
   - Face-to-face instruction
   - Online instruction
   - Hybrid instruction: mostly use Face-to-Face time, but use online instruction for specific tasks, projects, or units
   - Other (Add details in Comment Box)

7. When organizing my classroom space, I prefer .....
   - a traditional setting. I keep desks in rows, with occasional shifts for small-group or partner work

- ☐ open learning environments. If I had the space and money, I would have areasdesigned for small-group work
- ☐ mostly traditional, but I rearrange desks depending upon the time of the year and the unit being taught.
- ☐ Other (Add details in Comment Box)

8. When reading for academic purposes, I prefer
   - ☐ Printed text
   - ☐ Digital text
   - ☐ I am comfortable with either one.
   - ☐ Other (Add details in Comment Box)

Section 4, Post-Workshop Survey:

Future Preferences

#4. Future Preferences

Click on the button that best completes your preferences for using online applications for educational purposes in the future.

Future Preferences *
If given opportunity and time, which digital applications might you try in the future?

	0 = I'd prefer not to do this.	1 = I'm interested, but my skills are not adequate for me to pursue this on my own.	2 = I might, depending upon the situation.	3 = I definitely would.
Using a website (like a wiki) created by a colleague for collaborative purposes.	○	○	○	○
Creating a class website (like a wiki) for students to view content information.	○	○	○	○
Creating a class website (like a wiki) for student-to-student reflection or collaboration.	○	○	○	○
Using a document on Google Drive for teacher collaboration.	○	○	○	○
Creating a document on Google Drive for student collaboration.	○	○	○	○
Using more of the digital tools available on my district's website: Moodle or School Fusion tools.	○	○	○	○
Creating online spaces (with apps of your choice) for student-to-student collaboration.	○	○	○	○

Comments or Clarifications about Future Preferences
Use this space to add further explanations or clarifications concerning any of the items in this section.

APPENDIX C

Post hoc Reliability

I conducted a post hoc reliability test using the IBM Statistical Product and Service Solutions (SPSS) computer statistical software program to determine whether 18 survey items from two sections of the pre-/post- surveys were measuring a single construct and whether the items might be combined into a scale score to measure participant gains. I first ran an analysis of each item used in the scale, combining the totals of all participants' scores for pre-survey tech knowledge and experience and the totals of all participants' post-survey tech knowledge and experience, receiving a Cronbach's Alpha score of .630, which was below the desired .70 cutoff.

I then analyzed the two sections of the survey individually, seeking further information about the reliability of the items used in each section of the survey. The nine items of the Pre- Post- Knowledge Section yielded high scalability (Cronbach's Alpha = .934), demonstrating a strong relationship between the individual items used in that section of the survey. However, the scalability of the nine Pre-/Post- Technology Experience items were below the recommended cutoff point (Cronbach's Alpha = .380), When analyzing the Item-Total Statistics graph generated by the SPSS computer program, an inconsistency appeared in Pre-Workshop Experience Item #5: Using Social Networking for Academic Purposes (See Table 7.1).

After this item was removed – the Pre-Workshop and post-workshop scores for Experience Item #5—the remaining 17 items were analyzed one more time. This last reliability analysis yielded a Cronbach's Alpha of .925, demonstrating a strong relationship between the remaining survey items. The data analysis described in the dissertation reflects the scores of these 17 remaining survey items.

Table C.1
Analysis of Survey Items from All the Right Stuff

Section and Rating Scale	Survey Item	Cronbach's Alpha if Item Deleted	
		Pre-Item	Post- Item
Technology Knowledge Scale: 0 = No knowledge. I have very little interest or no need. 1 = No knowledge. However, I've heard of this and I'm interested. 2 = Limited Knowledge Level. I've	#1: Using Learning Management Systems (e.g., SchoolFusion)	.941	.932
	#2: Taking digital notes while reading digital texts (e.g., OneNote, Evernote)	.934	.934
	#3: Using hardware and/or digital tools for instructional purposes	.934	.934

explored this once or twice, but I don't have enough knowledge to work on my own. 3 = Adequate Knowledge Level. I have a proficient level of knowledge. I just need more time and more practice. 4 = Strong Knowledge Level. I can explain or teach this to colleagues and to my students. Section Reliability of Scale with n = 18 (9 items x 2 for pre/post scores): Original Cronbach's Alpha for this section = **.934**	#4: Using online interactive websites for instructional purposes	.929	.930
	#5: Designing, editing, and managing websites	.927	.933
	#6: Creating and managing blogs	.926	.928
	#7: Using online storage systems (e.g., LiveBinders, DrobBox)	.928	.928
	#8: Using online collaboration with students	.929	.925
	#9: Creating digital projects or presentations that can be viewed on the Internet	.927	.931
Technology Experience and Skills Scale: 0 = No experience and not interested. 1 = No experience but interested in learning more. 2 = Limited experience. (I've used this rarely -maybe three times during the last 2 years- either with students or for professional purposes) 3 = Adequate experience. (I use this occasionally -maybe once or twice a semester - either with students or for professional purposes) 4 = Experienced. (I use this regularly -once or twice a week - either with students or for professional purposes) Section Reliability of Scale with n = 18 (all 9 items x2 for pre/post scores): Original Cronbach's Alpha for this survey section = **.380** **** Item deleted from scale***	*Experiences with online devices and applications such as:*		
	#1: Google Docs (now called Google Drive)	.348	.379
	#2: Mobile Devices (examples: iPads, iPods, Smart Phones, tablets)	.306	.328
	#3: Wikis (examples: Google Sites, WikiSpaces, PBWiki)	.344	.364
	#4: Blogs (examples: EduBlog, KidsBlog)	.355	.380
	#5: Social Networking for academic purposes (examples: FaceBook, MySpace)	**.879 ***	**.323 ***
	#6: Cloud Storage for files and links (examples: DropBox, LiveBinders, Diigo, Delicious, Mendeley, EverNote)	.369	.371
	#7: E-readers, e-zines, or e-books	.371	.301
	#8: Using apps or sites that incorporate multimedia or hypertext (examples: Dipity, Prezi, Animoto, StoryBird)	.362	.343
	#9: Online databases (examples: LiLI, ERIC, other e-libraries)	.391	.365

Final Reliability of Scale (Item-Total Statistics: n = 17. Total of 17 survey items from pre-workshop survey compared to Total of 17 survey items from post-workshop survey: Cronbach's Alpha = **.925** **(Cutoff point for reliability: Cronbach's Alpha = .70)**

APPENDIX D

CCSS Alignment Activity

Many of the CCSS Anchor Standards incorporate the use of technology into critical reading and writing skills throughout the K -12 grades. Taking a deeper look at this progression of skills across the grades may provide insight as you look for ways to strengthen your instructional practices to increase student achievement.

We'll be using this survey as a tool to self-assess how well your current teaching practices align with standards that specifically address technology and critical reading or writing skills. We'll then analyze and discuss the results as a way to make professional goals for growth during this course.

Steps:

1) Complete the survey individually.

On the next two pages, you'll find CCSS anchor standards listed at the top of the middle column. Then, under each anchor standard, you'll see a list of Grade-Specific standards that follow that strand and how it evolves through the grades. The grade levels have been removed; for this first step, please focus on your students' skill levels rather than grade levels.

2) Analyze the survey.

For this part, you'll get a copy of the standard strands with the grade levels added back in. Analyze the results and share them with a partner. What surprised you? What didn't?

3) Discuss with the large group.

What are our strengths and weaknesses concerning these standards? How well do our curriculum and/or our instructional practices align with the standards?

When looking at these specific anchor standards, how can we strengthen our students' critical reading and writing skills?

4) Set goals.

Using the information learned from the survey, each participating teacher will choose one or two areas on which to focus.

CCSS Survey Directions

The left column responses are related to your current classroom practices:

Instructional Purpose. *How well do your current instructional practices math CCSS critical reading and writing skills for your students?*

Put an **X** in each row to the left of the standard that best matches:

NA: (Not Applicable) The skill suggested by this grade-level standard does not seem to fit my content area. It may be above or below my grade level.

N: (Never or rarely) I have not taught this skill, but would like to find ways to do so.

O: (Occasionally) I teach this skill once or maybe twice throughout the year.

R: (Regularly) I consistently teach this skill throughout the year at least once a month. It is an integral part of my instructional planning.

The right column is a quick assessment of your students' current level of achievement:

Student Achievement Levels. *How many of your students meet your expectations for the skill level suggested by each grade level standard?* Check the box to the right of the standard that best matches your students' current achievement levels. (Make an approximation that includes all your general education students who do not require special services for academic help.)

Instructional Purpose				**Reading** **Anchor #7**: *Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.*	**Student Achievement Levels**		
NA	**N**	**O**	**R**	***Students will:***	25% or less Meet	Approx. 50% Meet	75% or more Meet
				Draw on information from multiple sources, including digital sources, demonstrating the ability **to locate** an answer to a question quickly or to solve a problem efficiently			
				Integrate information from a variety of sources, including digital sources, **to develop a coherent understanding** of a topic.			
				Compare and contrast a text to an audio, video, or multimedia version of the text, **analyzing each medium's portrayal of a subject**.			
				Evaluate the advantages & disadvantages of using different mediums to present a particular idea or topic.			
				Analyze different accounts of a subject told in various mediums, **determining which details are emphasized** in each account.			
				Integrate and evaluate multiple sources of information in order **to address** a question or solve a problem			

(Note: this is the first page of the original CCSS Survey. Four more pages followed for the other four standards. See all of the standards in the answer key, following.)

CCSS Survey, Part II: Alignment Key

Here are the answers! In the left-hand column you will find the key to specific grade-level standards. When more than one standard is listed, that means the same standard is duplicated; it is found in both the CCSS Handbook for English Language Arts (ELA) and Literacy in Hist/Social Studies, Science, and Technical Subjects (WHST). Compare this key with your answers from Part I. Then, complete the ***Summary of CCSS Survey***. Discuss what you notice with your group. Look for similarities and for differences.

	Reading **Anchor #7**: *Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.*	**Student Achievement Levels**		
Key to Grade Level Standards:	***Students will:***	25% or less Meet	Approx. 50% Meet	75% or more Meet
5th grade ELA RI.5.7	**Draw on information** from multiple sources, including digital sources, demonstrating the ability **to locate** an answer to a question quickly or to solve a problem efficiently			
6th grade ELA RI.6.7	**Integrate information** from a variety of sources, including digital sources, **to develop a coherent understanding** of a topic.			
7th grade ELA RI.7.7	**Compare and contrast** a text to an audio, video, or multimedia version of the text, **analyzing each medium's portrayal of a subject**.			
8th grade ELA RI.8.7	**Evaluate the advantages & disadvantages** of using different mediums to present a particular idea or topic.			
9th-10th grade ELA RI.9-10.7	**Analyze different accounts** of a subject told in various mediums, **determining which details are emphasized** in each account.			
11th-12th grade ELA RI.11-12.7	**Integrate and evaluate multiple sources of information** in order **to address** a question or solve a problem			

	Writing ***Anchor Standard #6:*** *Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.*	**Student Achievement Levels**		
Key to Grade-Level Standards:	***Students will:***	25% or less Meet	Approx. 50% Meet	75% or more Meet
K – 3rd grade ELA W.K-3.6	**With guidance** and support from adults, **use a variety of digital tools to produce and publish writing**, including in **collaboration with peers**.			
4th grade ELA W.4.6	With **some** guidance and support from adults, use technology, including the Internet, **to produce and publish writing** as well as **interact and collaborate** with others. **Keyboarding skills sufficient to type one page** in a single setting.			
5th – 6th grade ELA W.5-6.6	Use technology, including the internet, to **produce and publish writing** as well as to **interact and collaborate** with others. **Keyboarding skills sufficient to type two or three pages** in a single setting. *[This level does not mention guidance or support from adults.]*			
7th grade ELA W.7.6	Use technology, including the Internet, to produce and publish writing **and link to and cite sources** as well as **to interact and collaborate with others**, including linking to and citing sources. [This level does not mention keyboarding, assuming that students are proficient typists.]			
8th grade ELA: W.8.6 and H/SS,S,TS: WHST.6-8.6	Use technology, including the Internet, to produce and publish writing **and present the relationships between information and ideas efficiently** as well as **to interact and collaborate with others.**			
9th - 10th grade ELA: W.9-10.6 and H/SS,S,TS: WHST.9-10.6	**Produce, publish and update individual or shared writing products**, taking advantage of tech's capacity **to link to other information flexibly and dynamically**.			
11th – 12th grade ELA: W.11-12.6 and H/SS,S,TS: WHST.11-2.6	**Produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information**.			

	Researching ***Anchor Standard #8:*** *Gather relevant information from multiple print and digital sources, assessing the credibility and accuracy of each source, and integrating the information while avoiding plagiarism.*	**Student Achievement Levels**		
Key to Grade-Level Standards:	***Students will:***	25% or less Meet	Approx 50% Meet	75% or more Meet
3rd Grade ELA W.3.8	**Recall information from experiences** or **gather information from print and digital sources**; **take brief notes** on sources and sort evidence into categories.			
4th Grade ELA W.4.8	Recall information from experiences or gather information from print and digital sources; **take notes and categorize information**, and provide a list of sources.			
5th Grade ELA W.5.8	Recall information from experiences or gather information from print and digital sources; **summarize or paraphrase information in notes and finished work**, and provide a list of sources.			
6th Grade ELA W.6.8	Gather information from print and digital sources; **assess the credibility of each source**; and **quote or paraphrase** the **data and conclusions of others** while avoiding plagiarism and providing basic bibliographic information for sources.			
7th-8th Grade ELA: W.7-8.8 and H/SS,S,TS: WHST.7-8.8	Gather information from print and digital sources**, using search terms effectively***;* assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and **following a standard format for citation**.			
9th-10th Grade ELA: W.9-10.8 and H/SS,S,TS: WHST.9-10.8	Gather **relevant** information from print and digital sources, **using advanced searches effectively***;* **assess the usefulness of each source** in answering the research question; **integrate information into the text selectively to maintain the flow of ideas**, avoiding plagiarism and following a standard format for citation.			
11th-12th Grade ELA: W.11-12.8 and H/SS,S,TS: WHST.11-12.8	Gather relevant information **from multiple authoritative print and digital sources**, using advanced searches effectively*;* **assess the strengths and limitations** of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism **and overreliance on any one source** and following a standard format for citation.			

	Speaking and Listening: ***Collaboration Anchor Standard #2:*** *Preparing for and participating effectively in a range of conversations and collaborations with diverse partners, building on other's ideas and expressing their own clearly and persuasively.*	**Student Achievement Levels**		
Key to Grade-Level Standards:	***Students will:***	25% or less meet	Approx. 50% meet	75% or more meet
6th Grade ELA: SL.6.2	**Interpret information presented** in diverse media and formats (e.g., visually, quantitatively, orally) **and explain how it contributes** to a topic, text, or issue under study.			
7th Grade ELA: SL.7.2	**Analyze the main ideas and supporting details presented** in diverse media and **formats and explain how the ideas clarify** a topic, text, or issue under study.			
8th Grade ELA: SL.8.2	**Analyze the purpose of information** presented in diverse media and formats (e.g., visually, quantitatively, orally) **and evaluate the motives** (e.g., social, commercial, political) behind its presentation.			
9th-10th Grade ELA: SL.9-10.2	**Integrate multiple sources of information** presented in diverse media or formats (e.g., visually, quantitatively, orally) **evaluating the credibility and accuracy** of each source.			
11th-12th Grade ELA: SL.11-12.2	Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) **in order to make informed decisions and solve problems**, evaluating the credibility and accuracy of each source **and noting any discrepancies among the data.**			

	Speaking and Listening: ***Presentation Anchor Standard #5:*** *Making strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.*	**Student Achievement Levels**		
Key to Grade-Level Standards:	***Students will:***	25% or less meet	Approx. 50% meet	75% or more meet
5th Grade ELA: SL.5.5	Include multimedia components (e.g., graphics, images, music, and sound) and visual displays **in presentations when appropriate to enhance the development of main ideas or themes.**			
6th Grade ELA: SL.6.5	Include multimedia components (e.g., graphics, images, music, and sound) and visual displays **in presentations to clarify information**.			
7th Grade ELA: SL.7.5	Include multimedia components (e.g., graphics, images, music, and sound) and visual displays **in presentations to clarify claims and findings and emphasize salient points.**			
8th Grade ELA: SL.7.5	**Integrate** multimedia and visual displays **into presentations to clarify information, strengthen claims and evidence, and add interest**.			
9th – 12th Grades ELA: SL.9-12.5	**Make strategic use** of digital media (e.g., textual, graphical, audio, visual, and interactive elements) **in presentations to enhance understanding of findings, reasoning, and evidence** and to add interest.			

Summary of CCSS Survey

Consider the five anchor standards used in Part I of the survey when answering the following questions.

1) Are you spending an adequate amount of instructional time with anchor standards that explicitly mandate digital literacy skills? Are there differences between the anchor strands (Reading, Writing, Researching, Speaking and Listening)? Explain why or why not.

2) How far ahead or how far behind are your students as compared to your grade-level standards? Do you need to fill in some gaps? (Definition of "gap": A CCSS standard at a younger grade level that has been skipped or overlooked.) If so, list them. Explain as needed.

3) Choose items from the grade-level standards in areas of your choice to help you set instructional goals for your students. What areas will you target to prepare your students to be ready for the CCSS standards in the grades above your level?

4) Other comments or reflections:

APPENDIX E

Measures of Student Proficiency

Criteria will be from the grade-level CCSS standards as determined by participating teachers. Teachers will first fill in their individual student proficiency measures, then use tally marks to classroom data.

Measures of Student Proficiency

Teachers,

1) Fill in grade-level criteria measures as we discussed during the workshop activity. (See your Survey for CCSS Alignment)
2) Then, go through the names of your students from each of your classes that you used for your digital literacy project. Decide each student's proficiency level in each of the four criteria measures.
3) Put a tally mark in each cell, corresponding with each individual student's level of proficiency. Each student may receive 4 tally marks, one in reach of the 4 rows.

For example, if Billy met your expectations in online reading skills, but still could not write or communicate well, he might receive an M for Criteria #1, an N for criteria #2, and an I for Criteria #3. Because he did well during his team presentation, he might also receive an I for Criteria #4. See sample check marks √ below for Billy's scores.

Criteria Measures from the CCSS:	N Needs Improvement or No evidence seen	I Improving	M Meets Expecta-tions	E Exceeds Expectations	Percentage of Students meeting or exceeding Expectations for each Criteria:
Criteria #1: Critical Reading:			√		
Criteria #2: Critical Writing:	√				
Criteria #3: Communication/ Collaboration with Peers:		√			
Criteria #4: Presentation Skills:		√			
Total number of tally marks in each column:					

Number of classes that participated in projects: _____

Total number of students in those classes: _____

APPENDIX F

Quests and Grading Rubric

CCSS Workshop Grading Rubric

There are now 3 different paths that all lead to the 1000 points required to receive a passing grade for workshop credit. Choose the path that fits your skill level, your students, and your instructional goals for meeting the critical literacy CCSS anchor strands that you targeted.

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1. Beginner Path:
700 Knowledge & Experience Skills + **300** Classroom Connection points = **1000** points

- Between now and your middle small-group session (planned for Feb. 20th), complete Knowledge & Experience Quests.
- Plan to add two posts a week to your workshop wiki reflection page.
- During the small-group middle session, you'll be guided to complete Steps #1-3, plus you'll design the first part of Step #4: Building a prototype of your idea.
- You'll share your prototype at the last session.

If you choose this path, you will not be required to try your project out with your students. (But of course, you may if you would like!)

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2. Intermediate Path:
500 Knowledge & Experience Skills + **500** Classroom Connection points = **1000 points**

- Between now and your middle small-group session, target one SMALL project (i.e., introducing Wordle to students, exploring Visual Thesaurus with your students, building your homepage on School Fusion, making a small wiki to house one specific class project, creating and using a Google Drive form with your students, etc.)

- Target and complete Knowledge and Skill Quests targeted to assist you with your small project. (Ask Meleah to add a Quest if there isn't one to meet your needs.)

- Before your small-group middle session, complete all of your Knowledge and Skill Quests. Complete Steps #1-3 of the Classroom Connections Quests. Have a prototype of your project idea started (this is part of Step #4).

- Remember to make one post to your journal reflections page at least once a week.

- Then, during your small-group middle session, you'll be guided to edit and revise your project prototype. You'll also be guided to plan your assessment rubric.

- After the middle session, you'll complete Steps #4 & #5 with your students. To make implementation more manageable, you may want to try a small group of students are one period rather than all of your students. (**Suggestion:** don't just target your Accelerated students. Online work is highly motivating for all students!)

This project may take longer than our last session together, so you will share your progress at the last session on March 18th.

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3. Advanced Path:

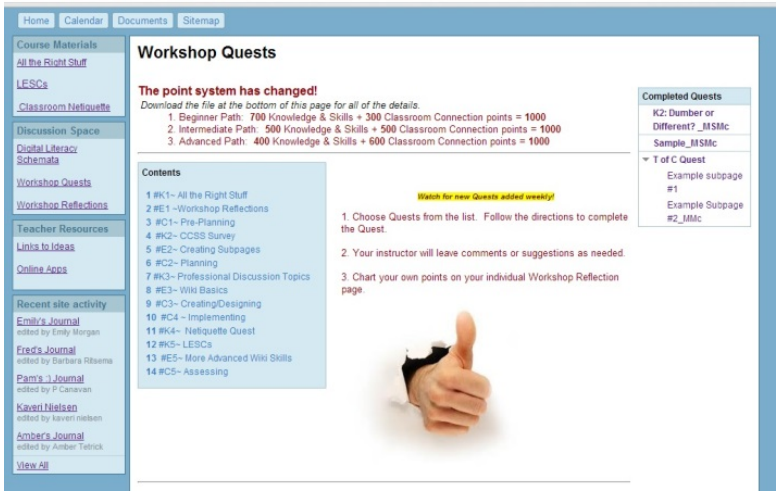
400 Knowledge and Skills points + **600** Classroom Connections points = **1000** points

(Because your project may be large and complicated, like involving two different classrooms in a wiki, you'll be awarded an extra 100 points for Steps #4 & #5.)

- For this path, set your own pace for Steps # 1 – 4 of the Classroom Connections. When you get your prototype of your project ready for inspection, please send me an email. If possible, I will meet with you and/or your team face-to-face to help you edit and revise before you try it with your students. (And if not face-to-face, we'll set up a Google Hangout—multiple people can collaborate all at the same time, see each other's faces, and also see the leader's computer screen. It's like meeting on Skype, but all participants can watch as the leader edits the project.)

- A middle small-group session will not be required for the Advanced path. You will be spending tons of time completing your project! Feel free to invite me to a team planning session any time in February/March. Also, feel free to invite me over to troubleshoot glitches.

- You are still required to post a journal reflection to the workshop wiki once a week as part of your Skills/Knowledge points. This project may take longer than our last session together, so you will share your progress at the last session on March 18th.



Knowledge Quests	Experience and Skills Quests	Classroom Connection Quests
#K1~ *All the Right Stuff* **Points Awarded:** 25 pts. **Description:** Online Survey of Tech Skills. **Difficulty:** Easy **Completion Task:** Click SUBMIT button at end of survey. Then, you're done. (Results are automatically sent to instructor)	**#E1 ~*Workshop Reflections*** **Points Awarded:** 10 pts. for every journal entry and for every response to a colleague's entry. **Description:** This will give you experience working in this asynchronous learning environment. **Difficulty:** Easy **Completion Task:** Self-graded. Add your points to your Journal Homepage. **Directions:** Receive points two different ways: 1. Write your own reflective entries into your personal online journal under the Workshop Reflections main page. Describe your goals, your progress, and your frustrations. 2. Respond to another colleague's work. Eventually, work will be scattered all over the workshop wiki. Always watch for the **K2 entries** (connected to the right side bar on this page.)	**#C1~ *Pre-Planning*** **Points Awarded:** 100 pts. **Description:** Choose an online tool or application for your learning environment. **Completion Task:** 1.**Write a Summary** of your decision. Include your reasoning behind your decision. 2. Make an entry in your Journal homepage. 3. Clearly label the task. [**C#1: Pre-Planning Summary**]. Make links in your summary so that the instructor can find your pros/cons chart and your brainstorming. **Directions:** **1. Gather possible ideas.** What online tools or apps will work for your students in your classroom? Consider information that you've gathered from the *Right Stuff* survey and the *CCSS* survey. 2. **Choose your top two or three ideas.** Make a pros/cons chart to help you make the best decision. **Suggestion:** Try to make your pros/cons chart digitally. Make a subpage under your Journal homepage. Label it as you wish. Organize your thoughts as you wish. Make a Subpage Listings gadget on your Journal homepage so that you can easily get to your link. (See my example on Meleah's Journal page.)
#K2~ *CCSS Survey*	**#E2~ *Creating Subpages***	**#C2~ *Planning***

APPENDIX G

Qualitative Codes for Cycle One and Cycle Two

Codes look like: **Place(OC): CODE: SubCode : sub-categories/ types of comments** So, the code **W(OC): COMM: P to C : org** = written on the **wiki** during **out**-of-class time: a **COMM**unication : **Part**icipant wrote to another **C**olleague : **organizing** a time for an upcoming session

Coding Annotations			
Place & Time: (OC or IC)	CODE	SubCode	Sub-categories (types of comments - - can be for either COMM or CC)
W = data typed on workshop wiki **OC** = out-of-class **IC** = in class	**COMM** = a **communication** between a colleague or the instructor	The first person is the one who initiated the conversation: **P to C** = participant to other colleague(s) **C to P** = colleague to participant **I to P** = instructor to participant **P to I** = participant to instructor **P to S** = participant to self	Colleague to colleague communications: **help** = asks for help or clarification about application or course content **inst** = gives answers to others' questions; offers to help **org** = uses the wiki for organizational things: setting up future meetings times and places **TC** = Task completion. Neutral comment stating that task was completed successfully, usually as part of a Quest assignment **IMming** = instant messaging chit-chat or banter, collegial inside jokes or comments between participants e.g.: *"Maybe this will help Pxxxx be a better speller."* **praise** initiated by participant **(P2Self)** = Praise to self **(P2Coll**) = Praise or thanks to colleague(s) **(P2 i)** = Praise or thanks to instructor

			++, - -, ~~ = **emotions or reactions** added to reflections or comments: **(++)** = overcoming obstacles or problems. *E.g.: "This is getting easier." "Yippee!" "This is challenging, but I'm overcoming it. " "This is hard, but I feel confident that I'll get it."* **(--)** = this challenge is too much. I'm frustrated. E.g.: "*This is confusing!"* **(--TECH)** = specific frustration with a technology issue – something didn't work when tried in a different setting, etc. E.g.: "*The T of C will NOT work for me!"* **(-- TIME)** = feeling pressured for time; time is the main frustration vented **(~~)** = reservations seen, but still hopeful , ambivalent, or neutral. Participant is trying to keep an open mind. *E.g.: "This is a huge learning curve for me. But I WILL get this" "This could be fun, but…." "but hopefully"* **(inst)** Instructor's comments **(inst/praise)** praise to participant **(inst/enc)** encouragement to participant **(inst/inst)** instruction to participants **(inst/conn)** connection with participant

APPENDIX H

Qualitative Codes for Cycle Three

Directions to Inter-Raters: This is the last piece of qualitative data being used for my mixed-methods study. There were three different cycles of data; each cycle contained both quantitative and qualitative components. I've included the research questions for my study below, along with the codes that emerged as I did my first run through these 10 transcripts. Feel free to make note of other things that you notice, especially things that should be included in key factors (Question #2) and motivational factors (Question #5).

1. If teachers construct and implement units of study within their content area that use socially-constructed applications which provide for student-to-student collaboration, **will teachers be able to document positive student critical reading and writing growth in their classrooms**?

Coding: **Student Growth** Evidence of teacher participants trying an application with a group of students is discussed in the transcript. (***Note***: Student Growth seems to be emerging as a major motivational factor for a reason why participants wanted to improve their technology skills. Because of this, I'm adding Question #5 to my four original research questions. You do not have to separate Question #1 from Question #5 when coding Student Growth, but please include additional insights as needed.)

(Note: not all teacher participants were able to construct and implement a project with their students, so this is not available in all 10 transcripts! However, a couple of the participants explain this in great detail.)

2. What **factors will enhance or inhibit** the effective use of these online applications in classrooms?

Coding: **Key Factors** (These were analyzed thoroughly in Cycles 1 and 2.)

Subcoding:

-- Teacher training: Teacher participants talk about lack of availability for tech training, either past or present

-- Logistics: Schools still have limited tech capabilities, especially limited availability of computer labs

-- Time: Teachers are kept too busy—for various reasons-- to learn desired tech skills

-- Lower SES: Students do not have access to computers or the Internet at home

-- Student Readiness: The students at a participant's school are perceived as not ready to handle online collaboration for various reasons.

-- Colleague Resistance: Participants discuss teacher resistance towards technology at their schools

++ Fitting Classroom need: Participants discuss about the tech app fitting well for student or classroom needs (They found the right tool for the right need in their classroom.)

++ Setting Clear Student Guidelines: Participants discuss seeing success when they've developed and then taught clear guidelines for Etiquette/Netiquette/ student internet use /student organization skills

++ Student engagement: Participants talk about student engagement when using tech apps; thus, the use of the app made instruction and learning easier.

++ or -- Technology Skill Level: Participant discusses difficulties or benefits of being a "techie" when learning new apps for this workshop

++ or -- Other: mark other key factors that may impede or enhance the effective use of technology for teachers in their classrooms

3. Did teacher participants **perceive a significant growth in either their technology knowledge or skills**? Are there changes in participants' classroom practices?

Coding: Teacher Growth : Evidence is seen of specific individual professional growth or change in classroom pedagogical practices

(This question is answered in more detail within quantitative data, and may not always be clear within these interviews.)

4. Will teacher partipcants choose to use online apps **for student-to-student collaboration in the future**?

Coding: Tech Plans

Subcoding:

Past: Have done online student collab in past

Present: Using it presently

Future: It's a future goal (i.e.: "That's something I definitely want to do in the future.")

Not sure: I'm not sure if I'm going to use online student collab apps in the future. (or, how I'm going to use them)

Not ready: I'm not ready; there are other things that I need to learn or do first

5. What **encourages or motivates teacher participants to learn** new technology?

Coding: Why Participants Learn

Subcoding:

Student Growth: 1. Teachers saw positive student growth in actual experiments with the technology.

Or: 2. Teachers want to learn new technologies in order to help their students learn better.

Teacher Use: The technology makes either instruction or paper grading easier or more effective.

Curriculum Needs: The participant took the workshop because this technology needs to be incorporated into teacher participants' daily instruction with the advent of the Common Core Standards or 21st Century skills

Purpose for taking Workshop: **1.** This Professional Development workshop would fit better within the PLC (Professional Learning Communities) Model—as a way to learn, not taking workshop because of credits (It's a district rule: Can't offer workshop for credit during PLC time) Or **2.** Participant took the workshop mainly for the university credits.

Interest or past interest in technology: Participants just like using technology because they've always been interested in the newest technology; not connected to student growth.

Coding: How Participants Learn

Subcoding:

Learner Type: What type of learner is the teacher participant? Examples: can only learn with step-by-step instruction, can see it once and then "run with it", Self-exploration (i.e.: "Give me a menu of items and let me pick and choose which ones I want to learn")

Type of PD Training. Participant discusses preferred times, length of times, etc.

Socio-constructivist Paradigm: Evidence of Vygotsky's theories seen. Examples:

Build or connect from the known to the unknown: "I've done a lot of statistics before, and so that's where I started with my project." "You have to have a working knowledge of the key terms before the online help desk will actually help you." "I had already connected with**…"**

It takes time to discover and learn new concepts, which is sometimes messy: "New things take time." "It's not always smooth."

Zone of Proximal Development seen: "It was really hard at first, but it became easier"… "I was pushed out of my comfort zone."

Learning from others (apprenticeship model): "Always looking for new ideas… stealing things from others." "To see somebody who's so practiced in…" "Just to see… how far people could take their web site…"

Other: Explain other things seen.

APPENDIX I

Examples of Data Displays

Table I.1.
Data Matrix #1: Comparison of Experience Levels and Learning/Instructional Preferences: Quantitative and Qualitative Data from Pre-Workshop Survey

	Participant Code *	Total Self-Rating	Knowledge Self-Rating	Experience Self-rating	Instructional Preferences	Use of Wikipedia in Classroom
Self-Rated Experience	Exp A	54	27	27	Small, Student-centered groups	Used the same as all encyclopedias
	Exp B	51	20	31	Varies instruction	Used the same as all encyclopedias
	Exp C	40	18	22	Varies instruction	Not used/not reliable
	Exp D	49	23	26	Small, Student-centered groups	Not used/not reliable
	Beg A	36	9	27	Varies instruction	Not used/not reliable
	Beg B	32	10	22	Varies instruction	Other-not specified
	Beg C	31	15	16	Whole-class instruction	Used the same as all encyclopedias
	Beg D	27	17	10	Small, Student-centered groups	Not used/not reliable
	Beg E	25	11	14	Varies instruction	Used the same as all encyclopedias
	Beg F	16	8	8	Small, Student-centered groups	Not used/not reliable
	Beg G	15	4	11	Varies instruction	Other-not specified
		Total Possible: 72	Total Possible: 36	Total Possible: 36	Experienced: 50/50 Beginners: 60/40	Experienced: 50/50 Beginners: 50/50

* "Exp" = participants more experienced with technology "Beg" = participants who rated themselves with beginning-level skills

Note: Beginner A fell in between the two categories. But, due to the low self-rating for knowledge, placed with those with beginning-level skills for Cycle 1 & 2 analyses

Data Matrix #1, Continued

	Participant Code *	Total Self-Rating	Preferred Learning Environment for Teaching	Preferred way to teach students computer skills	Personal reading preferences when learning
Self-Rated Experience	Exp A	54	Hybrid (combination of F2F & online)	In computer lab	Either print or digital
	Exp B	51	F2F	Either in lab or small groups in classroom	Either
	Exp C	40	F2F	In computer lab	Print
	Exp D	49	Hybrid (combination of F2F & online)	Either in lab or small groups in classroom	Print
	Beg A	36	F2F	In computer lab	Either
	Beg B	32	F2F	Not comfortable teaching students technology	Print
	Beg C	31	F2F	In computer lab	Print
	Beg D	27	F2F	In computer lab	Print
	Beg E	25	F2F	In computer lab	Print
	Beg F	16	F2F	Either in lab or small groups in classroom	Print
	Beg G	15	F2F	Not comfortable teaching students technology	Print
		Total Possible: 72	Experienced: 50/50 Beginners: 100%	Experienced: 100% Beginners: 70% ready	Experienced:50/50 Beginners: 90% print

Table I.2.
Data Matrix #2: Progression of Teachers as Learners

Qualitative and Quantitative Data from Cycles 1 & 2
Original table included all data coded as "Participant emotions or reactions to the learning process." This version provides a smaller, random sample of quotes from the original table.
Note: Represents 4/4 more experienced participants, but only 4/7 beginning participants. Three did not continue journals after first two sessions.

Cycle 1 (1/28/2013 – 2/9/2012)	**Frustrations**	**ZPD**	**Successes**	**Universal Factors**
	- -	~~	+ +	
Participants More Experienced With Online Apps (Quotes represent 4 of teacher participants)	**1/28- 1/30** (No frustrations coded) **2/4** Only 1 coded: *Losing my mind over [the wiki's] T of C*	**1/28 – 1/30** *Sometimes I find "the back side" thing confusing, but I'm going to get over that asap.* **2/4** *I was taking a tour of our wiki in progress and thinking about how to add a picture. .. It disappeared. Ugh! Sometimes this online world can be really frustrating. Oh well, try and try again…* ☺	**1/28** • *I'm loving the time to work and experiment. I've never used Google Sites and I really like the format and style of it.* **1/30** • *So excited to work on this wiki.* **2/4** • *Building my SF unit. Lots of cool ideas. Need to organize activities in subpages.*	**1/28- 1/30** -- TIME: *Hard to find time to practice, but when I do it's straight forward.* --TIME: *It seems to always take longer than you think to plan everything out, get it linked up and created, and then have it ready to go.* **2/4** *--TECH: Tried to dabble with YouTube video. Got denied access on the computer I am working on.*

Cycle 1 (1/28/2013 – 2/9/2012)	**Frustrations**	**ZPD**	**Successes**	**Universal Factors**
	- -	~~	+ +	
Participants Beginning with Online Apps (Quotes represent 7/7 participants)	**1/28- 1/30** • This is so confusing! • I not want to create a permission slip. I have no idea how to create a netticate for WIKi . • *Hello! This is a huge learning curve for me!! HELP needed* ☺ • *This is going to be out of my comfort zone* • *I am open to learning this, but need more concrete information… I am NOT in the "cloud".* • *I'm feeling more overwhelmed than ever* • *This is way above me. I will need this*	**1/28 – 1/30** • *This class will be a stretch for me, but I am very curious to experiment with all this new "stuff."* • *Today has been more of a challenge, but I am experimenting and figuring out how to do things. ..I have decided I need to make a WIKI page for myself. That is my next big challenge.* • *I'm hoping I can get to the point where I'm comfortable enough to…* • *This class session I hope will clarify things.* **2/4** • *I know I need to start out slow and easy and then build up from*	**1/28** • *Hey, Xxxxx. We can do this!* **1/30** • *Feeling better now… have an idea* • This is exciting! A little overwelming, but exciting. …We will leave with some good ideas. • *Stick figure on page, jumping and shouting Hooray!* • *I felt pretty good… Intimidated, but ended up being interesting, fun, and not that hard* **2/4** • *I'm a little proud of myself. I played around with*	**1/30** *(-- TIME: Wow. So much too little time.* *(-- TECH): Computer labs are very difficult to schedule.* **2/5** *-- TIME: Thinking if I spend two or three times a week (while I have a student teacher) I could get some work done.* *-- TIME: Just enough time to know I need to sit down for more than my prep to do this.*

	in 101 version.	*there.* • *Now it is just a matter of sitting down and playing my way through all of the things that can be done.*	*Animoto and created a video of my dogs. It's about 10 seconds long but it makes me laugh.* • *I was having a hard time… I finally did it, and now I realize it's pretty easy.*	

Cycle 2 **(2/10 - 3/16/2013**	**Frustrations**	**ZPD**	**Successes**	**Universal Factors**
Codings	- -	~~	+ +	
Participants More Experienced with Online Apps (Quotes represent 4/4 of teacher participants)	**2/27** • *[Just a quick email to let you know that] I am planning to attend the next session. This has been a much more daunting project than I thought it would be. I am feeling overwhelmed at school and at home. Anyway, I hope we can make some traction on March 6th.*	**2/26** • *… I have felt very daunted about this class and project, but we are here to get some work done. So..here's to tonight and being productive!!! Fingers crossed.* • *Okay… [my partner] and I have decided this is going to be a lot of work…but we're up for the challenge.* **3/12** • *I love working in this digital format. …I am stretching my learning!*	**2/11** • *I did this [online lesson in Fusion] for my evaluation and [my principal] loved it.* **2/24** • *I've been reading about LESC and online assessments Fascinating! I am intrigued …I cannot say enough about this exciting research. I'd love to attend a seminar or workshop on this approach.* • *Ok.. we actually got some stuff done!! .. I am starting to see our wiki shape up. This is exciting and makes me feel like this might be a great use of my time. I do feel confident that this wiki could be a permanent fixture of my classroom across the years.* • *I think we have a long way to go before our wiki does everything we have envisioned…but I think it can be pretty close.* **3/4** • *I have added labels to all my Moodle activities. Spiced up the page and hopefully will intrigue students more. Will come in on Weds… so this will give us a chance to work* together side by side. **3/12** • *I'm loving all of the things we are learning about how to edit and*	**2/10** *++TECH & --TIME: With such limited computer access, I do not have time to teach students how to build a wiki page. They can, in Moodle, complete a number of activities and share ideas in an efficient and shared format.* *TIME: I have limited access to tech (labs booked til May 31st!)* *TECH: Tech disparity at home for some students …Will require ramping up student skills to accomplish tasks – learning curve will take time.* *…Requires Netiquette training and oversight* **2/26** *++TECH: I know we're not using our wiki as it could be used for student input, but I like the idea that we can easily create a webpage together and edit it from different buildings. This is a huge plus with the wiki as opposed to a standard website.* *-- TIME: I think our plan to use this next year was one of our better decisions. It relieves our stress and we can make sure everything is the best it can be before we put it in front of our students.* *--TIME: This time of year is tough. My students are tough, teachers are grouchy, and I am feeling*

			create our wiki page. I still feel like we will use it as a webpage more than a wiki…but who knows… maybe next year we'll be ready to move on to the next level. I like, again, the possibilities that Xxxx and I have to work together and hopefully, in the future for our students to collaborate and share their work as well. • *The overall experience with kids was great! I really learned by trial and error process. I am really enjoying the resource folders and attaching to online so that I can access it at any times.* • *This is a super-cool tool. It makes my sight look better and I feel like I have another piece of control over the google world.*	*overwhelmed.* **3/16** *-- TECH & TIME: I can see from where we are headed that I will also need to worry about how to help my students read digital information. I'm excited about the possibilities, but also daunted by the hugeness of it all.* *++ & --TECH: I found from prior experience that the initial set up of sharing the site can be lengthy. But, I like that it is such an accessible format for teachers and students. I can also see how it would be cool to share the site with parents at the end of a project.* *~~TECH: One of the challenges that I saw in the information is the idea that there is no common format for information on the web. It can be very different depending on who creates it and the time it was created. So it is a constant learning curve and we really need to be up to date.* *Challenging.* *Challenging.* *Challenging.*

Cycle 2 **(2/10- 3/16/2013**	**Frustrations**	**ZPD**	**Successes**	**Universal Factors**
	- -	~~	+ +	
Participants Beginning with Online Apps (Quotes represent 4/7 participants)	**2/20** • *As I get more knowledge and try more things with my WIKI page, the frustration seems to mount. There has to be a better way to do this!*	**2/13** • *Got a bit too confident yesterday. Tried to change an icon in the user name bar…[on my wiki] and made a mess. After fiddling for 40 min. gave up. My intern fixed it in less than five minutes.* **2/20** • *It was a good class on Wednesday. There were a couple of things on my page that I wanted to change, but I couldn't figure it*	**2/12** • *I have the basic idea for my WWI wiki. It is going to be simple for my first try. I'm excited to get going.* • *I'm really getting into this. This is so much easier than I thought it was. This could begin to consume me!* • *This doesn't work much differently from Fusion* • *We are smarter than we thought we were. ☺ … I know, we ROCK!* **3/3**	**2/13** --TECH: *The problem may lie in the fact that I am using their free version. But that is what the students will be using.* **2/20** *--TECH: [The app help line] said they were having problems with program. I realized that this could happen in my class with my students, and that could present a problem. So, I want to make sure that whatever I choose for my students, I feel comfortable with it.*

		out. Xxxxx helped me. **3/6** • *As I feel more confident in my abilities at "WIKKING", I am making bigger messes. Right now, I have spent at least 2 hours trying to clean up a mess I made. I guess this is a part of the learning process, but it sure is annoying.* **3/16** • *Started to work on my [novel] site. Started to use a template from someone else that I found on Google site, but decided to delete entire project. I would be better off starting from scratch and developing one by myself. I was absent yesterday and missed Meleah's tutorial. … But learned lots from this experience however.* • *Many thanks to Xxxxx who helped me set this up and drove away those illusions about the expanded capabilities of [this online Application]*	• *Just completed a page on my wiki. Not as fearful as when I started the class, just one more application of online and internet tools to enhance student learning. …WOW. This "old dog" still has a lot to offer.* • *I made some progress lately. … Finally I got it up and running on my school computer and expected it to be a difficult tool to use like my other tries. But no, it was easy, fun, and got me excited to use it with my [students]* • *…The copying part was a bit of a struggle, but after a good night's sleep, I was able to do it. Hey, not bad for a beginner!* **3/13** • *I keep working on my WIKI and keep finding things I can do with it. I hope to make it a useful learning site for my students.* • *I've been exploring different sites today, such as ….[3 new, different apps]… There is so much out there that I can use with my students. I wonder where I'll be in a few years from now with digital learning. …* **3/18** *Wow! I have learned a lot. I look at what I have accomplished and feel pretty good about it. I have a lot more to learn, but now I feel I can do it! Thanks for all your help.*	*--TECH: Someone got into a participant's School Fusion page.* *--TECH: Not able to make a link between WIKI and School Fusion.* **3/3** *--TECH: I tried to use Wordle.net with my new computer and ran into problems with Java, frustrating me to no end. Finally got it up and running on my school computer.*

Table I.3.

Data Matrix #3: Practice Time on Workshop Wiki

Quantitative Data from Revision History

What motivates the participants to practice?
Is accountability an important factor?

Participants In order from Cycle 1	Points on chart	Total Revisions	Kept online journal	OC (out-of-class) Revisions	% of OC Revisions	Other comments
Beg A	1125	158		21	13%	Had student teacher
Beg B	1005	121		50	41%	Made no revisions to workshop wiki during the first session.
Beg C	85	11		0	0%	
Beg D	25	34		2	6%	Noted in reflection journal: dislike for points system
Beg E	255	49		11	22%	
Beg F	975	34		5	15%	
Beg G	1010	76		30	39%	Had student teacher
Exp A		59		5	8%	Made all wiki revisions during 1st two sessions, except journal revisions.
Exp B	845	54		14	26%	
Exp C	450	35		2	6%	
Exp D	1275	67		6	9%	

"Beg" = Participants who had rated themselves as "beginners" on Pre-Workshop Survey
"Exp" = Partiicdpants who had rated themselves as "more experienced" on Pre-Workshop Survey
Participant Labels are the same as Data Table #1

Data Matrix #3, continued

Chart #1
Participants organized by Total Revisions
Who made the most revisions? At what times?

		Total Revisions	% OC	Kept regular online journal
Beg A		158	13%*	1
Beg B		121	41%	1
Beg G		76	39%*	1
Exp D		67	9%	1
Exp A		59	8%	1
Exp B		54	26%	1
Beg E		49	22%	0
Exp C		35	6%	1
Beg D		34	6%	0
Beg F		34	15%	1
Beg C		11	0%	0

- Experts moved quickly to their projects. Only needed to practice in class.
- Beg A also moved quickly to personal wiki project.
- Not able to track OC time on personal projects.
- Exp. A completed all wiki skill basics in 1st session. Started project on 2nd night.

Chart #2
Participants organized by Point Chart on Workshop Wiki

	Points on chart	Kept regular journal
Exp D	1275	1
Beg A	1125	1
Beg G	1010	1
Beg B	1005	1
Beg F	975	1
Exp B	845	1
Exp C	450	1
Beg E	255	0
Beg C	85	0
Beg D	25	0
Exp A	0	1

- Note: Both experts and beginners are represented at top bottom & top.
- Exp C & B were on "fast track" for point system, but unable to complete project as hoped with students.
- No participants were held accountable to the points system to pass class..

Data Matrix #3, continued

Chart #3
Beginners organized by revisions.
OC = time spent on workshop wiki outside of class sessions

	Total Revisions	% OC	Kept regular journal
Beg A*	158	13%	1
Beg B	121	41%	1
Beg G*	76	39%	1
Beg E	49	22%	0
Beg D	34	6%	0
Beg F	34	15%	1
Beg C	11	0%	0

Experts averaged 12% OC
Beginners averaged 23% - not including Beg C
* Two beginners had student teachers, so more time for practice was available.

Chart #4
Beginners organized by points.
Did the points or the journal motivate the beginners??

	points on chart	Total Revisions	Kept regular journal
Beg A	1125	158	1
Beg G	1010	76	1
Beg B	1005	121	1
Beg F	975	34	1
Beg E	255	49	0
Beg C	85	11	0
Beg D	25	34	0

Beginners who regularly kept up their journals also had higher amounts of revisions and points on charts.

Table I.4.

Data Matrix #4: Teachers as Learners

Qualitative data from wiki reflections and interviews
"Italics" = direct quotes not in italics = summary

Connections	Teachers Resistant to Learning Tech	Teachers as Learners: Willing to Learn (Limited by Tech Skills)	Teachers as Learners: Team Players	Teachers as Learners: Get R' Done	Teachers as Learners: Self-Explorers	Mastery Level
	0	2	4	2	3	3
# of Participants Represented in each Column		I'd like to pick and choose what I'm ready to learn.	Let me explore with my partner.	How does this apply to me?	*"I really learned by trial and error process."*	I heard about this new idea and tried it…
Characteristics	Four participants talked about teacher resistance they've seen at their schools.	*"I had stayed away from a lot of the web pages. I had no clue how to start. "*	*"Thanks, Xxxxx, I love having a colleague who wants to work together."*	*Teachers want something they can actually take out and use and apply immediately. "*	*"I'm not going to teach them something I don't know."*	Easily adapts a new app to fit needs
			"Yeah. We've done a lot of planning together."	*"And I'm not a person to sit there and fiddle. I don't have time to mess around with the settings."*	*"It just takes a lot of tinkering… it does. It does. And I think that my class is a great place."*	*"[She] just took it and ran with it."*
					"I did it! ..Now it is just a matter of sitting down and playing my way through all of the things that can be done."	
Overcoming Barriers	Participants reflected upon how resistant teachers used logistical problems as a reason not to try	*"Oh, my opinion has changed. I know that this is something that's here to stay."*	Overcame barriers by seeing success: *"…Just to see the success of all those teachers [who were in the workshop]. The availability…That was huge."*	*"At first I struggled with this idea of wikis. Not quite understanding what they were…even through the whole first class. …But, then, Okay! [explaining how she caught onto it…] …I can just apply this to what we're already doing on Fusion, so this is not a stretch anymore. It was, to start out with, but not anymore."*	*"So I think the teacher has to enjoy it, too, and kind of buy into it as well."*	Talked about ways to "work around" tech logistical problems. Enjoyed discussing the Pros/Cons of various apps. *"Wikis were okay; but still need to consider…"*
		"I still have a lot to learn. …But I'm always willing to try."			*"My greatest gain [during the workshop] was my confidence level. And it's okay to fumble through it, even in front of kids. Because they will help me and they are very patient. And they understand technology—parts of it. Or, that sometimes it works and some times you have to wait. "*	
Driving Analogy	"Back in the day… those Model Ts were scary. Yeah.. a lot of power."	Has a learner's permit. Goes step by step in Driver's Manual.	Learns by observing others. Enjoys encouragement from others.	Doesn't want to tinker with the motor. Just wants to drive.	Learns best by driving alone on the back roads.	Ready for solo journey on new roads.
Motivational Factors	"The more teachers you can get into professional development programs and explain the idea of digital literacy, the better."	*"I've got to do this. It's the wave of the future."*	*"You have to constantly evolve because the skills are changing."*	*"It made me think more about how to engage students."*	*"My students love tech."*	*"We need to provide technology skills that students can transfer regardless of the program they're in."*
		"The kids will be more engaged."	*"…Seeing all of the stuff that is out there that these kids absolutely need."*		*"For me to use it within my actual curriculum with the students."*	
		"I got to actually use it with my	*"…So, listen to what this one kid*		*"I like this. ..the more creative my*	

		students."	*did…"*		*students can be [is great]."*	
Guidance	*"It's very hard to bring all teachers on board with anything. You know, they get entrenched in what they do. I think that's one of the hardest things is to move forward in a district is to get teachers to buy into a system of change."*	• *"I think little, short, 30 minute –cover one topic. And in chronological order: we're going to cover this, this, this, and this…."* • *"[I got lost and stayed away from the wiki for a while}…When I got behind what they were doing."* • *"[The new apps] were frustrating because the instructions on the web sites are not the best.* • *One participant was coached on a regular basis by an administrative candidate working at school*	*"I really like the working session. So, we could go and… I didn't have to necessarily learn anything new. But I could tinker on the wiki or sit and listen to some talk about Slide Rocket."* *"So you learn best by watching somebody else and playing with somebody else, and actually getting to practice. And that's how I am."*	*"I'll need little refreshers of what things mean and where to find things."* *"[Teachers] don't want fancy lectures; They want something hands-on that they can develop."*	*"What would be really nice on your wiki page would be a help screen where I could look things up."* *"She just stepped right in and started playing with it. But I'm just not like that."* *"I really like how you kind of left it to exploration."* [but not sure if it would work for her students.]	*"If no else tells you, I don't know how you find out."* *"For this course, I' really love to simply learn what else is out there. ..to improve the quality of materials that I deliver online would be GREAT!"* • *"I'm just keeping it in the back of my mind."* • *"that's what was beneficial to me …your welcomed knowledge… walking into the workshop and seeing all of the stuff that is out there that these kids absolutely need."*
PLC Model ?	*"I know some people are very resistant to making these big changes –there are a lot of big changes in education right now. … I think learning the use of technology is more of a help than a hindrance, that it really can help you. …If people could just see that it is…"* *"When I tried to discuss [my online project] with my team, it wasn't as salient for them as it was for me. …I still get a lot of …backlash."*	One-on-one or Traditional PD class *If you're back in the fall, make sure you show me how to do the collaboration thing."* *"When are you teaching this class again?"*	+ PLC Model *"The PLC time can be used for professional development. That's part of one of the things that they're hoping to do with that."* *"And wouldn't it be great to have a little in-service on this… Maybe at the first few minutes of the PLCs…"*	+ PLC Model PD could happen with PLC? *"…Yeah, something that doesn't take too long. Like if you could tone it down… If it was something that took two or three times…or, if you came once a month for three months and have people try to come back and report. I think that would be ideal. People could do that."*	? PLC Model *"And what's interesting is now …since I put my wiki out for the public to see …I've had some other teachers look at it and they're asking me, well how can you use this? So it's been good. Very good."*	PLC Model But invite experts/ guest speakers Appreciated and sought expert advice. Explored theories on own. Even if you're good at tech, you need time to connect and learn from others. *"When it's not a class that they're taking for credit, there's no conflict of interest".*

Future Use of Online Apps with Students	?	*"Right now with the CC and the changing of all the testing, I really haven't a clue. …I need to see everything first."*	*"Oh I'm totally ready for it. I just don't know quite how to implement it."*	*"I haven't got to the point where they're actually going one-on-one with each other, but looks exciting for next year. I'd like to give it a try."*	*"I hope next year to do some more online blogging."*	*"I'm just keeping it in the back of my mind, trying to figure out where it will fit best, or what I'd like to try…"*
		"I'll have to wait and see."	One team successfully created unit with application this spring		*"I haven't tried having [my students] put anything on yet. I'm still just building."*	

APPENDIX J

Example Netiquette Guidelines

Netiquette = Etiquette on the Net

Here is a list of our classroom rules for collaborative online work.

Please remember that academic language is as imperative online as it is in the classroom.

If you see a Netiquette issue, please let Ms. [redacted] know. Also remember that Ms. [redacted] is *automatically* sent an email every time a student makes a change on the wiki for any reason. She is also sent the date, time, the student's name, and a screen capture of exactly what was said or added.

Classroom Rule:	**Comments:**
Do not erase anyone else's work.	• Remember, when you are in the editing mode, you can change anything at any time. ***Think before you click!*** • It also helps to type text into a text document (like Word) first. Then, if something happens, you'll have a backup. ***Save often!*** • When an accident happens, use the "Undo" arrow on the left side of the web editing tool bar. ***Undo is your friend!*** • When a large accident occurs (whole pages seem lost, huge amounts of material seems to be missing) notify Ms. [redacted]. As owner of the wiki, she can get in the "backside" of the wiki revision history and restore things to former editions.

Be your best self online.	This wiki is an extension of Ms. [redacted]'s English Language Arts classroom. What you write and post is important to her and to your classmates. ***Be a positive encourager.***
Add your first name and date to all responses.	You will be able to read and respond to any of your classmate's journal entries from both periods at any time. Ms. [redacted] will know who wrote the response on the backside of the wiki. But please be considerate to your peers. Put your name and date every time you add a question or response to a classmate's text so that everyone knows who said what. Sometimes it helps to change font color as well. Here's the recommended format. You found a great image for Chapter 15. Well done! (Where did you find it??) It really captures the essence of the theme about prejudice that our team discussed in class. Go to my journal entry on 3/25 for more about our discussion. Here's the link: xxxxx **[Bob 3/26]**
Use appropriate school language.	Remember that your individual journal entries are being graded by your English teacher. **Practice your best formal academic writing skills** for journal entries and all required assignments. But, the online world does allow for flexibility as you respond and collaborate outside of your formal journal responses. Think about how you say things and what questions you ask to your teammates during literature circle time. Then think of ways that you can respond with that same tone here online. Ms. McCulley calls this "casual academic language." You don't have to sound like a stuffy textbook as you respond to friends and classmates. **Practice writing with a polite, humorous tone** when corresponding in online collaborations. (BTW, this style of writing is becoming a valued skill in the business world.) For example: ~Use simple emoticons to show facial expressions: **:P :D :(** ~Avoid long strings of txt mss. Texting is accepted as a form of written communication, but it is a slang/private tone to use on your cell with your BFFs. On the wiki, you are "talking" in front of the class so that everyone can understand you. However, an occasional text messaging acronym might be appropriate during informal discussions on the wiki. For example: add **LOL** as a way of politely chuckling or an occasional **IMHO** (for ***In My Humble Opinion)*** may be added when you're interjecting your opinion in the middle of a discussion. ~**PLEASE AVOID ALL CAPS.** This is considered getting in someone's face and shouting at them.
Be considerate of other's online time.	Unfortunately, **only one person at a time can edit a page out on a wiki.** Sometimes as you collaborate, you will get into a page, click the edit mode, and find that someone else is online editing the page. You will receive a pop up message that will tell you who is on the page editing. Be Polite. **Don't leave a wiki page open in edit mode unless you are actually editing. SAVE** when you've finished with your immediate thoughts and before you go out to search for an image or information. If you need lots of time to process your thoughts, work in Word first. Then, copy/paste your text into the wiki page. Individual Journal Response pages belong to that individual student. It's your grade, so you need priority time to access your page at all times. Anyone can view your page at any time. But, if someone is hogging your personal journal response page and you need to get on, let them know. If it's been too long, text, call, or IM your teammate to remind him/her that his/her time is up, or that he/she forgot to save the page, or find out what's going on. It's often an honest mistake to leave a wiki page open without saving so no one else can jump on. If it's not an emergency, there are many options available to you: 1) Create a new wiki subpage to type your thoughts. Subpages are easy to add and delete as needed. 2) Type your thoughts or dump your images into another file (Word or OneNote or DropBox) while you wait. 3) Go to outside links and finish some research on a topic 4) and of course, don't forget about your hard copy of TKAM. Catch up on your reading!

Plagarism is ***not*** acceptable.	**Do not copy and paste text from other sites.** This is very tempting for students of all ages because cliff notes, other students' work from around the world, as well as a plethora of other sources are all readily available . Best advice: • *Do* go out and read other *reliable* sources. (Yes, Wikipedia can be a reliable source. Use it like you would a World Book Encyclopedia to find general information and key words. Also, use the external links on the bottom of an entry. You'll often find great links to other reliable sources. However, do remember that Wikipedia is a wiki --anyone can edit or add information--so it can be opinionated, especially on current topics.) • *Use* multiple sources for a broader viewpoint of your topic. • *Do* collaborate with your peers. • *Do* read and discuss all that you can. • *Gather all of the information that you can.* Then, ***synthesize*** all that you learned on your topic into a concise summary. ***Use your own words.*** **Use outside sources appropriately,** and **give them credit**. Appropriate uses include 1) when you want to strengthen your argument (i.e., "According to the latest figures from the U.S. Department of Agriculture, potatoes are.....), or 2) when you want to guide others to awesome websites that are informational on a topic, or 3) someone says something exactly the way that you want others to hear it (i.e., As Bessie Stanley said in 1904, "To laugh often and much is to win the respect of intelligent people..."). The easiest way to credit your sources on the wiki is to **make a hyperlink to the outside site.** (see the hyperlink to Bessie's quote in the last example.). **This includes images.** Most of the images connected with Google apps may be used for educational purposes without identification. But when you copy/paste images from unique places, let others know who/where you found them.