New Literacies Integration by Student Teacher/Cooperating Teacher Dyads in Elementary Schools: A Collective Case Study

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NEW LITERACIES INTEGRATION BY STUDENT TEACHER/COOPERATING
TEACHER DYADS IN ELEMENTARY SCHOOLS:
A COLLECTIVE CASE STUDY

by

Laurie A. Friedrich

A DISSERTATION

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NEW LITERACIES INTEGRATION BY STUDENT TEACHER/COOPERATING
TEACHER DYADS IN ELEMENTARY SCHOOLS: A COLLECTIVE CASE STUDY

Laurie A. Friedrich, Ph.D.

University of Nebraska, 2014

Advisor: Kathleen Wilson

Situated in Technological Pedagogical Content Knowledge (TPACK) and collaborative inquiry, this collective case study examines new literacies integration by student teacher/cooperating teacher (ST/CT) dyads supported by a coach in elementary schools. The study took place at a large Midwestern public school district where many STs from a large Midwestern public university complete their student teaching experience. Through detailed vignettes of five ST/CT dyads, this study provides an explicit view of varieties of dyad collaboration when a new literacies emphasis is included in the student teaching semester. Research questions prompt the examination of dyad new literacies integration through (a) enacting professional development in the classroom, (b) planning lessons to involve children with new literacies and (c) impacting dyad collaboration. ST and CT detailed descriptions provide a valuable insight into processes and effects of this integration focus. Lessons learned include collaborative approaches to integration that work, teacher growth comes with empowerment, and dyad partners become learners together when adding a new literacies focus. An innovative student teaching design arises to prepare teachers for 21st century classrooms.
Dedication

To my loving and supportive husband Brian, without whose encouragement I would never have embarked upon this life-changing journey. I love you forever!
Author’s Acknowledgements

Many people supported me as I pursued a lifelong goal of earning a Ph.D. Already as a child my parents instilled in my brother and me a belief that we could accomplish anything we set our minds to, loving us with an unconditional love. Many teachers and professors continued to shape me into a teacher who cares deeply about students and loves what I do each day.

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Finally, I would like to thank my family and my God, without whom none of this would be possible. Brian, Micah, Leah, and Phil, thank you for understanding when I could not do all the things I would have liked to do with you, now I’m ready! Leah, thank you for assisting me with transcription and encouraging notes as together we pursued graduate dreams. And to my Lord and Savior Jesus Christ for performing miracles every day in my life and for opening my eyes to see them. To Him be the glory.
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CHAPTER 1: INTRODUCTION

Imagine a school committed to helping students identify meaningful problems and collaborate to seek answers and develop solutions, becoming creative, competent and confident contributors to the global community. Imagine a school that believes that the student should experience authentic learning opportunities, and that learning and growth of educators is just as important as the learning of children. Imagine a school where the roles of educators are reimagined to coach learners to design and create fuel-efficient transportation, robots, or flying drones in a technologically sophisticated learning community. Where teachers facilitate multidisciplinary and project-based learning and form partnerships to engage learners in real-world learning opportunities in and outside of the classroom. Imagine a school where teachers teach in a blended 1-1 digital-device learning environment, creating videos for online access in a flipped classroom approach. This school instills new literacies standards into academic standards with the intent of producing lifelong online learning skills and dispositions.

Is this the type of school that teacher education programs are preparing preservice teachers to enter? Are these the learning goals we set for children in today’s schools to prepare them for college and careers in the 21st century and beyond? This imagined school already exists (i.e. http://www.ageschool.org) with more schools moving in this direction according to the most recent Horizon Report (NMC, 2014). To place student learning in a digital world at the forefront of education in a rapidly changing global learning environment requires collaboration between teachers, students, administrators, and teacher preparation programs:

As networked information resources become more extensive and complexly structured, and as Information and Communication Technologies (ICTs) continue
to change with some frequency, no one person can be expected to know everything there is to know about the technologies of literacy; these technologies will simply change too quickly and be too extensive to permit any single person to be literate in them all. Each of us, however, will know something useful to others.” (Leu, 2002, p. 328)

This study examined the collaboration process between student teachers and cooperating teachers when attempting to integrate new literacies into their classrooms. The goal was to begin to understand how to best support student teachers and cooperating teacher dyads in this endeavor.

To be productive citizens in today’s global economy students must develop 21st century skills to effectively use technologies needed in today’s world (NCTE, 2007; IRA, 2009; Partnership for 21st Century Skills, 2009; Walser, 2011). With a growing number of Americans using multiple digital devices (Pew, 2012) the “digital divide” no longer refers only to access to technology devices, but also to the ability to effectively locate, integrate, evaluate and create useful information on the Internet for a variety of purposes through those devices (Digital transformation, 2007). Even formerly individual activities such as reading, writing, or watching movies now require new literacies skills and strategies as the Internet and social media allow us to participate with others “alone together” (Jacobs & Gallo, 2002). We can now read, write, watch, and discuss simultaneously as we communicate our thoughts electronically to an online audience. These emerging processes require new ways of thinking, planning, teaching, and learning.

Need for New Literacies
**Information and communication skills.** Students today are expected to strategically use both print and digital sources to research topics, locate information, and produce multimedia displays and presentations to communicate learning (CCSS-ELA, 2010; NCTE, 2008; IRA, 2009). New technologies are emerging almost daily, each requiring new literacy skills and strategies to fully utilize their potential (Leu, 2010). To effectively use online sources in this manner, students need new literacies skills, including online reading comprehension practices that go beyond print strategies to enable students to use search engines, predict best links to answer questions, and write using new formats including blogs (Leu, 2010). Leu, Kinzer, Coiro, and Cammack (2004) define new literacies as follows:

The new literacies of the Internet and other ICTs include the skills, strategies, and dispositions necessary to successfully use and adapt to the rapidly changing information and communication technologies and contexts that continuously emerge in our world and influence all areas of our personal and professional lives. These new literacies allow us to use the Internet and other ICTs to identify important questions, locate information, critically evaluate the usefulness of that information, synthesize information to answer those questions, and then communicate those answers to others. (p. 1572)

As students’ use of technology outside of schools continues to grow stimulated by greater numbers of cell phones, iPads, wireless Internet connections, online social networks, and video games, students in many schools are asked to “power down” in school turning their technology off rather than using it to learn (Casey, 2008). Gee (2012) likens this directive to teachers providing manuals for students to read without ever
allowing them to play the game that the manual was teaching. What we need are teachers who can build upon student engagement with technology and networking. Incorporating new literacies skills into the curriculum prepares students to function in a global world where they need both content and technology skills.

**Educational standards.** To prepare students with the knowledge and skills they need to be successful using these 21st century skills in college and careers, the Common Core State Standards (CCSS-ELA) integrate technology standards across the content areas. Forty-five states have adopted the full CCSS, and Minnesota adopted the Reading standards including technology components of new literacies. In addition, 49 of the 50 U.S. states have already adopted, adapted, or referenced the International Society for Technology in Education’s (ISTE) National Educational Technology Standards for K-12 students in their state department of education documents (ISTE, 2011). Students need skills with the new literacies of the Internet and other ICTs, and teachers need to integrate these skills into their teaching and student learning requiring a change in pedagogy for many teachers (NCTE, 2008).

**Change in pedagogical practices.** For many educators, pedagogy refers to “the art or science of teaching,” but in the digital age the emphasis is on the activity of learning as students become creators rather than consumers. The job market requires current practice and flexibility as technologies continually change, so teachers need to be life-long learners, and as Beetham and Sharpe (2013) describe, participate in continuous professional development. While some teachers are using technology in the classroom, many teachers do not participate in professional development nor do they know how to effectively integrate technology for teaching and learning in meaningful, student-centered
ways on a consistent basis (Li, 2007; Bauer & Kenton, 2005; Lankshear & Knobel, 2006; Leander, 2007; Pianfetti, 2001; Stolle, 2008). As a result, not all students are learning to use technology in ways that will make them lifelong independent learners.

We need to reconsider pedagogy for the 21st century. Rather than placing the main focus on teaching information, teachers may need to approach lessons differently guiding students to demonstrate teamwork, collaboration and self-directed learning to meet objectives rather than memorization of facts (Walser, 2011). Many educational organizations view student-centered learning as the most powerful strategy for student learning (ISTE, 2008; Partnership for 21st Century Learning, 2009), yet teachers and student teachers are more likely to use technology as a supportive instructional tool rather than empowering students to ask questions and find their own answers using various technologies (Choy, Wong, & Gao, 2009-10; Palak & Walls, 2009; Strudler & Wetzel, 1999). However, when teachers expect students to “conceptualize and actualize” ideas using technology as their medium (Cuban, Kirkpatrick, & Peck, 2001, p. 814), students become creators of media to communicate learning, a 21st century skill they will need in college, career, and beyond. To prepare teachers to teach new literacies in these student-centered ways we need effective forms of professional development.

**Insufficient Professional Development for New Literacies**

To effectively use ICTs, both students and teachers need new literacies to empower them to ask questions, locate answers, and communicate online (Leu et al., 2004). To develop these new literacies skills, pre- and inservice teachers need training in new literacies integration that leads to student-centered learning (Ertmer & Ottenbreit-Leftwich, 2010). The literature shows that the one-workshop approach to professional development...
development has not helped teachers integrate technology into the required curriculum (Apple, 2004; Butler & Sellbom, 2002; Cuban, Kirkpatrick, & Peck, 2001; Loveless, 2003; Mumtaz, 2000). On the whole, less than ten percent of teachers implement strategies learned in traditional workshops into their actual teaching (Joyce & Showers, 1988). A lack of ongoing support and collaboration for teachers exists to integrate technology into instruction following professional development (Brinkerhoff, 2006; Hutchison, 2012; Mouza, 2002; Mumtaz, 2000). However, when ongoing peer coaching is provided following the workshop, ninety-five percent of participants transferred learning to classroom practice (Joyce & Showers, 2002). Building upon the proven value of ongoing coaching we consider effective practices for new literacies professional development.

**Best practices for teachers learning technology.** Applying effective professional development strategies to technology integration helps teachers learn in ways that respect their current teaching. Teachers learn new technologies best within an adult learning context. Trusted mentors, who customize support to meet specific curriculum needs, demonstrate skills while collaborating with teachers to compose meaningful lessons (McKenzie, 1999). When a more knowledgeable colleague works alongside a teacher, professional development can be presented at the right level, to meet teachers’ own goals. By immediately integrating technology training into classroom teaching, teachers gain confidence in new methods because they see the effects on student achievement (Guskey, 1986). For desired changes in new literacies integration to occur, teachers need opportunities to apply new skills personally, experiment with their effectiveness in the classroom, and collect student data to validate results (Guskey, 1995).
These studies describe a progression of professional development supplemented by ongoing collaboration with a mentor: initial learning of integration strategies, planning lessons incorporating these strategies, teaching by integrating the strategies, and observing student results.

**Coaching.** Instructional coaches provide one example of mentors supporting teachers in their daily work (Dole, 2004). These coaches provide onsite professional development as they demonstrate evidence-based practices and then support teachers during their planning and enactment of these strategies. This coaching process entails mentoring, modeling, and observing with feedback to assist teachers in implementing new strategies (Lyons & Pinnell, 2001). While coaching has been positively related with students’ writing growth (Taylor, Pearson, Peterson, & Rodriguez, 2005) and higher quality implementation of educational reform (Matsumura, Garnier, & Resnick, 2010), technology coaching is a relatively new form of professional development. The existing research is limited, especially in the area of elementary new literacies coaching (Grove, Strudler, & Odell, 2004). McKenzie (1999) notes that teachers learn new technologies best when they are supported by colleagues they trust with personalized assistance in creating lessons that can be used immediately in their own classrooms. McKenzie further states, “coaching may be the most effective way to convert reluctant colleagues into enthusiastic users of new technologies” as they work alongside teachers to help them meet their own goals in a non-evaluative manner.

**Call for Innovative Teacher Education**

**School/university partnerships.** Wright and Wilson (2005) suggest that for change to take place in technology integration, preservice teachers must be effectively
prepared to begin the transition. Few preservice teachers observe technology integration in methods courses or field experiences, so they need new classroom and field experience models where university instructors and cooperating teachers effectively use technology in teaching and learning (Ertmer & Ottenbreit-Leftwich, 2010). Ertmer and Ottenbreit-Leftwich propose specific roles for preservice teachers, and suggest that inservice teachers should provide this modeling, but there is no mention of working with the two simultaneously during student teaching -- an idea I explored in this study. Ertmer and Ottenbreit-Leftwich further encourage preservice teachers, inservice teachers, and university faculty to collaborate to integrate technology in secondary classrooms. Some universities are exploring innovative programs for infusing technology into teacher education programs involving school district/university partnerships. Grove, Strudler, and Odell (2004) describe a mentoring program to support cooperating teachers who assist student teachers with technology integration. They recommend that other school district/university partnerships introduce technology usage in field experiences by providing frequent professional development sessions for cooperating teachers on student-centered technology strategies and ways to integrate them into the curriculum. In addition to modeling these strategies, cooperating teachers can also effectively mentor student teachers to integrate technology.

Gutierrez (2008) calls for a “Third Space” where practitioner knowledge in schools is merged with academic knowledge in universities in new ways to enhance preservice teachers’ learning. This transformative space can be less hierarchical so knowledge from cooperating teachers, university methods instructors, and supervisors is equally valued as providing expanded learning. Zeichner (2010) calls for a more
conversational relationship between equals as cooperating teachers and professors support preservice teacher learning in new ways. Taking this concept to the next level, I examined when technology becomes an area of focus in this transformative space, and where the preservice teacher could become a partner with new knowledge not represented by either the cooperating teacher or university supervisor.

**Student teaching models.** The traditional student teaching model is comprised of a student teacher (ST), cooperating teacher (CT), and university supervisor (Johnson & Napper-Owen, 2011). Because of the hierarchical chain of command inherent in this triad, the role of power can become a factor in determining how willing a ST or CT may be to try something new in the classroom when a supervisor is observing and evaluating (Anderson, 2007; Smith, E. R., 2007; Huffman, Holifield, & Holifield, 2003). Although not examined in this study, the supervisor is part of the dynamic. Suggestions for further research indicated a need to study ST/CT dyads as the potential standard in the student teaching experience (Caplow, 1968; Johnson & Napper-Owen, 2011).

The goals for student teaching are often set by university teacher education personnel and implemented by the CT. Many CTs believe the best experience for STs is to teach the whole class as much as possible to prepare them for their own classrooms. Feiman-Nemser (2012) questions whether even more powerful learning might take place if STs were supported by their CTs to engage in classroom inquiry by co-planning, co-teaching and coaching to scaffold their teaching growth. The issue here becomes the need for CT to both mentor and assess the ST and whether one role may conflict with the other.

Yusko and Feiman-Nemser (2008) provide an example where mentors did work
with beginning teachers to form a trustworthy relationship where both assistance and assessment is possible, although it can be challenging. Trusted teachers as mentors helped beginning teachers meet their professional goals while also assessing how they were meeting students’ learning needs. Feiman-Nemser (2012) determined that the impact of mentoring is dependent upon matching the appropriate mentor with the beginning teacher, providing school time for mentoring, training and supporting the mentor, and having partners clearly define their expectations for each other and what they will do together. Although Feiman-Nemser conducted this study with beginning teachers and a mentor, the concept could be further considered within the ST/CT dyad, and informed the professional development I incorporated with CTs.

**Developing teacher knowledge.** Teacher education prepares preservice teachers with knowledge in subject matter and pedagogy. Knowledge of subject matter content includes facts, concepts, theories and procedures teachers will need to know to convey new information to their students. Pedagogical knowledge consists of a variety of methods to explain concepts, with frameworks to organize and connect ideas to help students incorporate new learning into their existing knowledge. Shulman (1987) suggested that teachers must also know how students generally understand their subjects, as well as areas that they consistently misunderstand. Then, they can anticipate these misunderstandings and know how to deal with them when they arise. Shulman called this concept Pedagogical Content Knowledge.

As technology becomes more prevalent in society and begins to be integrated into teaching and learning, Koehler and Mishra (2009) argue that the most effective teaching takes place at the dynamic intersection of three areas of teacher knowledge: content,
pedagogy, and technology. They add Technological Knowledge as a third important component in planning effective learning experiences. Koehler et al., (2011) defines Technological Knowledge as knowing about print and digital technologies, including how to operate, create, and archive information using each. They called this framework for viewing effective teaching Technological Pedagogical Content Knowledge, or TPACK (Mishra & Koehler, 2006). While teacher education has taught content knowledge and pedagogical knowledge for many years, the technology component is still emerging in university courses and elementary classrooms in which field experiences are situated (Ertmer & Ottenbreit-Leftwich, 2010). I situate this study within the TPACK context.

**Goals of This Study**

The primary aim of this collective case study (Stake, 1995; Yin, 2003) was to examine supported new literacies integration by ST/CT dyads in elementary schools. Building upon the professional development literature, this study examined how collaboration for new literacies integration was enacted between a ST and CT when supported by a coach. Few studies explore technology coaching in general, and even fewer within the context of student teaching in elementary schools.

A secondary goal of this study was to determine how these dyads integrated content, pedagogy, and technology in their teaching and student learning. Viewed through the lens of Technological Pedagogical Content Knowledge (Mishra & Koehler, 2006), multiple data sources were triangulated to compare patterns of planning, teaching, and reflecting with input from STs and CTs following the Collaborative Inquiry model (Ball & Cohen, 1999; Palmisano, 2013).
Theoretical Framework

I situated this study in the Technological Pedagogical Content Knowledge (TPACK) (Mishra & Koehler, 2006) framework, incorporating the Collaborative Inquiry model (Ball & Cohen, 1999; Palmisano, 2013) for collaboration of ST/CT dyads to integrate new literacies into their instruction (see Figure 1). Technological Pedagogical Content Knowledge (TPACK) (Mishra & Koehler, 2006) is the place where important learning happens at the intersection of Teacher Content Knowledge, Pedagogical Knowledge, and Technological Knowledge. This framework builds on Shulman’s (1987) concept of Pedagogical Content Knowledge, knowledge of pedagogy useful for teaching specific content.

Figure 1. Technological Pedagogical Content Knowledge creates learning at the center of TPACK where students use technology to learn in ways not possible without its affordances. http://tpack.org.
Technology integration models. Several models attempt to describe a developmental continuum that teachers follow when attempting to integrate technology into their teaching. Apple Education (2004) proposed four stages teachers progress through when integrating technology, ranging from using technology to support traditional instruction to discovering entirely new uses for technology tools. More recently Puentedura (2009) described the SAMR model for integrating technology which furthers the Apple model to reflect the extended abilities of new technologies: (1) Substitution -- same student task using new technology; (2) Augmentation -- same student task but with increased functionality because of the technology; (3) Modification -- redesigning parts of the task to transform student learning; and (4) Redefinition -- creating new learning tasks that could not be imagined without using the technology. Both models propose a progression of teacher growth in technology integration beginning with learning to use a new technology, then using it to accomplish tasks they already do with students, and finally beginning to imagine how their teaching and student learning could be transformed by the technology. This process can be better understood by examining the components of the TPACK model.

TPACK components. Many teachers begin to integrate technology by focusing on Technology Knowledge alone, or the intersection of Technology Knowledge and Content Knowledge, as they learn how to use the components of technology. An example would be a teacher using a document camera without thought of how it could help achieve teaching/learning goals. A next step for the teacher would be to focus on the intersection of Technology Knowledge and Pedagogical Knowledge, using new technology to replace an existing technology or practice, such as completing a worksheet online. The final step
occurs when a teacher understands each component and focuses on the intersection of Technology, Pedagogy, and Content; here technology facilitates teaching and learning processes in new and innovative ways. An example of this TPACK lesson would be teaching writing content using process writing pedagogy with feedback, edits, and revisions and adding a blog format through integration of technology to allow students to write with and receive feedback from students at another school or in another country. This type of global, collaborative writing could not easily be done without the use of technology and exemplifies the possibilities when teachers utilize Technological Pedagogical Content Knowledge in teaching. The present study focused on dyad collaboration to achieve this type of student-centered active learning using technology.

More specifically, this study examined ST/CT collaboration to integrate the technology component into their pedagogical content knowledge. Through professional development with follow-up coaching the dyads participating in the study integrated new literacies into their instruction. This process of collaborative inquiry provides a model for innovative student teaching that includes new literacies integration.
## Definition of Terms

For the purpose of this study the following terms and their definitions are provided.

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<td>21\textsuperscript{st} century skills</td>
<td>The “soft skills” which are needed to effectively use rapidly changing technologies and to work and live in a global society: creativity, collaboration, innovation, critical thinking, problem solving, written and oral communication, self-direction, leadership, adaptability, responsibility, and global awareness (Walser, 2011, p.38).</td>
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<tr>
<td>New literacies</td>
<td>Skills, strategies, and dispositions necessary to effectively use 21\textsuperscript{st} century technologies including the Internet and other Information and Communication Technologies: identifying important questions, locating information, critically evaluating information, synthesizing information, and communicating by reading and writing simultaneously on the Internet (Leu et al., 2004).</td>
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<tr>
<td>New literacies integration</td>
<td>Intentionally including in lessons opportunities for students to use the Internet and other Information and Communication Technologies to identify important questions, locate information, critically evaluate the usefulness of that information, synthesize information to answer their questions, and then communicate those answers to others (Leu, Kinzer, Coiro, &amp; Cammack, 2004, p.1572).</td>
</tr>
<tr>
<td>Professional Development</td>
<td>Purposefully-generated opportunities to bring about transformations in teachers’ knowledge, understanding, skills, and commitments in what they know and what they are able to do with students (Feiman-Nemser, 2012, p.131). Professional development in this study takes the form of a technology conference, weekly coaching meetings, and a workshop.</td>
</tr>
<tr>
<td>Technology Coaching</td>
<td>Intentional professional development by a mentor to work directly with teachers and student teachers to integrate technology in teaching and student learning. In this study I served as the technology coach to provide support, training, and encouragement to dyads through weekly planning sessions to extend workshop learning.</td>
</tr>
</tbody>
</table>
| Technological Pedagogical Content Knowledge (TPACK) | A framework for authentic curricular integration of technology with complex and dynamic interactions between teachers’ technology, pedagogy, and content knowledge to create learning experiences where students use technology to further content depth (Mishra & Koehler, 2006).

*Pedagogical Content Knowledge is the knowledge of pedagogy effective for teaching content.

*Technological Content Knowledge is knowledge of the relationship between technology and subject content.

*Technological Pedagogical Knowledge is knowledge of various technologies as they are used in teaching and learning.

* Technological Pedagogical Content Knowledge (Mishra & Koehler, 2006) connects teachers’ technology, pedagogy, and content knowledge to create in-depth learning for students. |
| Information and Communication Technologies (ICTs) | The various ways we locate information and communicate in online spaces including online chats, video conferencing, gaming, social media, using search engines, and many more to come (Leu, Kinzer, Coiro & Cammack, 2004). |
| Collaboration | The process of working together to achieve shared goals by sharing perspectives, questioning, and evaluating to make sense of something new (Roschelle & Teasley, 1995). |
| Collaborative Inquiry | The cyclical process of planning, acting, and reflecting by the cooperating teacher, student teacher, and coach (Ball & Cohen, 1999; Palmisano, 2013). Student teachers and their cooperating teachers “bounced ideas off of each other” to integrate new literacies in their teaching. |
| Student teacher/cooperating teacher dyad (ST/CT dyad) | The participant unit studied comprised of a student teacher paired with a cooperating teacher during the student teaching experience. Two types of student teachers participated: undergraduates student teaching for a semester and graduates student teaching for two semesters. |
CHAPTER 2: REVIEW OF LITERATURE

The following review of literature focuses on three main areas that are significant to the study and provide a foundation for the research questions and purpose of the study: (1) New Literacies studies, (2) Professional development, and (3) Innovative student teaching programs.

The first section provides an overview of the expanding area of new literacies: the history of new literacies and related educational standards for elementary students, current practices of teachers in new literacies integration, and evolving empirical studies of new literacies. The second section focuses on professional development for new literacies integration: effective general practices, the Technological Pedagogical Content Knowledge (TPACK) model; and deficits and emerging models for new literacies professional development including collaboration and coaching. In the final section I will examine studies of innovative student teaching programs incorporating new literacies integration, especially focusing on ST/CT teams, coaching and co-teaching (see Figure 2).
Figure 2. Overview of literature review situating the current study within needed areas of collaborative professional development for new literacies integration within an innovative student teaching model.

New Literacies

Building a background for new literacies. To lay a foundation of new literacies and their suggested uses in learning, I begin with an overview of new literacies theory and practice. None of the CTs or STs in my study heard the term before we began: researchers and practitioners alike continue trying to define new literacies in titles such as
Embracing the Squishiness of Digital Literacy (Chase & Laufenberg, 2011). Terminology can be confusing with literacy (singular or plural) and similar terms including new literacies, digital literacies, and multiple literacies. I note the books and pivotal studies I read in my doctoral program as section headings as I highlight new literacies in education.

The first documented use of the term new literacies noted in an academic article was in 1993 by Buckingham just two years after the first message was sent on the World Wide Web. He called for a new definition of literacy that was not functional for only one technology; rather a broader consideration of the process of becoming literate with any type of technology. He learned that new literacies comprised a social process that blends the boundaries of text and media.

Apple study. In 1995 the decade-long research study by Apple, Classrooms of Tomorrow, paired researchers, teachers, and technology developers to look at how teaching and learning could be most effective when computers were added to classrooms. They learned that teachers could be most effective in this situation when they became facilitators and students created their own learning and communicated it to others (Apple, 1995). This longitudinal study defined a developmental continuum for teachers to integrate technology in their classrooms: (1) entry, learning how to use the technology; (2) adoption, using technology to support traditional practices; (3) adaptation, using technology to streamline existing student practices; (4) appropriation, using technology as one tool for collaborative project-based learning; and (5) invention, using technology in new ways to construct knowledge. Significant to the present study, the Classrooms of Tomorrow study found that teachers could progress more rapidly through these stages if
they had a mentor with more technology experience than themselves, opportunities for reflection on practice, or encouragement to examine their own teaching and learning beliefs.

“Handbook of Literacy and Technology.” Within five years of the academic use of new literacies, a landmark publication analyzed how technology was beginning to transform teaching, society, and literacy research (Reinking, McKenna, Labbo, & Keiffer, 1998). The authors examined possible uses for current technologies and the Internet to transform education for at-risk readers, young children, adolescents, and adults. They found a link between the technology and the skills, competencies, and literacies that are needed to use it effectively. As technology changed rapidly, new literacy skills continued to emerge.

New Literacy Studies. The New Literacy Studies (NLS) (Gee, 2000) approached the literacy and technology connection as sociocultural. Reading is not just a cognitive activity but something done within society. People connect with other people as they read and write participating in “communities of practice” (Lave & Wenger, 1991) or online “affinity groups” or “affinity spaces” (Gee, 2004). As the variety of social and cultural activities widened, each required new knowledge and vocabulary. So “literacy” became plural “literacies” (Gee, 2011). While the New Literacy Studies (NLS) focused on using written language in different sociocultural settings, the New Literacies Studies is an offshoot of NLS focusing on using multiple new digital technologies beyond print in a variety of sociocultural settings (Gee, 2011).

“What Research has to say about Reading Instruction.” Donald Leu began to expand the definition of reading instruction to include the new literacies required to
effectively use rapidly emerging ICTs. Affirming the Reinking et al. (1998) finding of a shortage of research on literacy and technology, Leu began to define the new literacies skills children needed in an ever-changing world including locating, evaluating, and collaborating globally, in addition to traditional reading and writing skills (Leu, 2002). He predicted that as the Internet entered more classrooms around the world, new literacies would become the most important area of research to determine best uses of the Internet in teaching and learning (Leu, 2002). Leu further predicted that traditional research may not happen fast enough to evaluate deictic technologies, so teacher collaboration with new literacies and sharing via the Internet may determine best practices:

As networked information resources become more extensive and complexly structured, and as ICTs continue to change with some frequency, no one person can be expected to know everything there is to know about the technologies of literacy; these technologies will simply change too quickly and be too extensive to permit any single person to be literate in them all. Each of us, however, will know something useful to others. (Leu, 2002, p. 328)

This model empowers teachers to determine new literacies learning experiences for children, as they facilitate rather than convey information. “Research time might be better spent on exploring issues of how to support teachers’ efforts to unlock the potentials of new technologies, and not demonstrating the learning gains from technologies we already know will be important to our children’s success” (Leu, 2000, p. 763). My study explores a new format to support ST/CT dyads as they collaborate to integrate new literacies.
“Toward a Theory of New literacies.” The New Literacies Research Lab at the University of Connecticut conducted studies to further expand the definition of literacy to include strategies needed to comprehend online multimedia. Leu, Kinzer, Coiro, and Cammack (2004) proposed a definition of new literacies that demonstrates the transactional relationship between literacy and technology that is still frequently cited today and the one I will utilize for this study so I state it again here:

The new literacies of the Internet and other ICTs (Information and Communication Technologies) include the skills, strategies, and dispositions necessary to successfully use and adapt to the rapidly changing information and communication technologies and contexts that continuously emerge in our world and influence all areas of our personal and professional lives. These new literacies allow us to use the Internet and the other ICTs to identify important questions, locate information, critically evaluate the usefulness of that information, synthesize information to answer those questions, and then communicate those answers to others. (Leu et al., 2004, p. 1572)

Lankshear and Knobel (2006) differentiate the content of new literacies by viewing them through two lenses. The “new technical stuff” refers to the digital tools and multimedia productions with which one must be competent when using technology to communicate learning. The “new ethos stuff” refers to the changing nature of learning and participation when using technology, as students ask questions and create rather than consume online materials, and teachers function as facilitators. Lankshear and Knobel’s research suggests the need to focus on new literacies teaching practices rather than use of tools in isolation, the format I used for coaching in my study.
Current new literacies research and standards. *The Handbook of Research on New Literacies* presented research findings across studies for instructional practices. Overarching findings included a need for understanding in the literacy community about skills, strategies, and practices that exemplify new literacies; movement from *if* to *how* educators should plan learning activities that incorporate ICTs; and the struggle to adapt current curriculum goals and literacy understandings to include new literacies skills (Coiro, Knobel, Lankshear, & Leu, 2008). Answering this call for research, my study focused on *how* ST/CT dyads integrate new literacies into the curriculum.

New literacies theory today is developing on two levels: upper-case (New Literacies) and lower-case (new literacies) (Leu, O’Byrne, Zawilinski, McVerry & Everett-Cacopardo, 2009). The lower-case new literacies each look at specific contexts, populations, and formats where new skills are needed for reading online. The broader New Literacies Theory incorporates an expanded explanation of literacy expressed in new social practices, new technologies, and new skills necessary for success in the activities of daily life (Lankshear & Knobel, 2006; Leander, 2007). New Literacies Theory is continually being formed as lower-case theories explore specific new literacies from different frameworks, contexts, and populations. My study adds to New Literacies Theory by examining new literacies integration by CT/ST dyads in elementary schools -- an underrepresented context and population.

To clarify new literacies for schools, educational standards define criteria necessary to demonstrate literacy. Requirements for use of new literacies are a key component of each statement. To further understand the concept of new literacies in professional literacy organization position statements and literacy standards, I examine
the following for the requirements placed on students and teachers regarding digital literacy.

In 2008 the National Council of Teachers of English adopted a position on 21st century literacies. New literacies range from ability to use technology tools; to building relationships to solve problems collaboratively; to managing, analyzing and synthesizing multiple streams of simultaneous information; and creating and critiquing multi-media texts (NCTE, 2008). Through coaching, my study assisted ST/CT dyads working collaboratively themselves before developing and using technology tools collaboratively with children.

The International Reading Association expanded the NCTE definition of new literacies to include the Internet as the defining medium for information, reading, communication, culture and learning in the 21st century (International Reading Association, 2009; Partnership for 21st Century Skills, 2009). Stating that students must be proficient in new literacies and 21st century technologies and that they have the right to be taught by teachers who use ICTs skillfully for teaching and learning, literacy educators now have the responsibility to effectively integrate new literacies in student learning (IRA, 2009). Additionally in 2010, IRA added the responsibility to support teachers in their efforts to use technology in literacy assessment and instruction. This requirement now demands professional development for teachers and new models of teacher preparation that include new literacies integration. My study implements one model for accomplishing this goal with both CT and ST during the student teaching semester.
The International Society for Technology in Education created new literacies standards for K-12 students and teachers. The ISTE (2008) standards concisely define six essential new literacies criteria for students in the 21st century: Creativity and Innovation; Communication and Collaboration; Research and Information Fluency; Critical Thinking, Problem Solving, and Decision Making; Digital Citizenship; and Technology Operations and Concepts. In addition, ISTE (2008) clarified teacher-required proficiencies using technology to design, implement, and assess learning experiences for students. Teachers must now engage in professional growth and lead in new literacies. My study helped teachers transition from learner to leader as they first engaged in a conference, workshop, and ongoing coaching, then at the conclusion of the study led a technology conference presentation.

The Common Core State Standards for English-Language Arts (CCSS-ELA) determine curriculum today requiring teachers to prepare students to fully participate in college and careers to successfully compete in a global economy. Forty-five states have adopted the Common Core State Standards so far, with media and technology skills intentionally integrated throughout the standards just as they are integrated in our 21st century society. The Standards require students to be competent in many new literacies including:

(a) CCSS.ELA-LITERACY.SL.4.5: Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes.

(b) CCSS.ELA-LITERACY.CCRA.W.6: Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
(c) CCSS.ELA-LITERACY.CCRA.W.8: Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

(d) CCSS.ELA-LITERACY.CCRA.R.7: Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words (CCSS-ELA).

Under the CCSS, all K-12 teachers will integrate literacy, both print and online, across the curriculum and be responsible for coaching students to achieve these standards (CCSS-ELA). Integration is necessary for successfully teaching new literacies in the context of robust standards and assessment timeframes. Many CTs and STs in my study were not aware of new literacies standards, yet when I explained them on a rubric for evaluating student technology projects one CT planned lessons to meet the standards.

**Concluding thoughts on New Literacies Theory.** New Literacies Theory is continually changing as new technologies rapidly emerge requiring new literacies to facilitate their use. The deictic nature of new literacies challenges the literacy community to continuously refine our definition of literacy and best practices that inform teaching and teacher preparation:

- Being literate today does not necessarily ensure that one will be fully literate tomorrow since new technologies will always appear, regularly requiring additional new literacies. Thus, when we speak of new literacies in an online age, we mean that literacy is not just new today; it becomes new every day of our lives. How we adapt to new literacies in these new times will define us as literacy educators. Most importantly, how we adapt in the classroom will define our
students’ futures. (Leu et al., 2013, p. 219)

In summary, as technologies continue to develop at a rapid pace requiring new literacies to use them effectively, teaching and learning must change to accommodate these new skills. Teachers, schools, and teacher preparation programs are trying to stay ahead of the curve, however anticipating skills students will need for college and career ten or more years into the future is nearly impossible. Next, I explore this challenging situation by examining some ways teachers are integrating new literacies into classes in innovative ways. This forms a background in which to situate the teaching examples of dyads in my study that I share in Chapter 4.

“Wicked problem.” Planning and teaching using technology has repeatedly been referred to as a “Wicked Problem.” Borko, Whitcomb, and Liston (2009) point out that, while new technologies hold great promise, teaching and learning with technologies can present challenges for teachers. They build upon Koehler and Mishra’s 2008 introduction to TPACK where they begin by describing teaching with technology as a “wicked problem” where a teacher strives to find the right combination of technologies, teaching methods, and instructional goals. Rittel and Weber (1973) began the general discussion of “wicked problems” describing them as problems with many challenging reliant variables, occurring in complex social contexts, and dynamic with no right answers. Effective new literacies integration can confuse teachers trying to select appropriate technology to meet content standards using a variety of teaching methods as technologies are rapidly evolving. In addition, teachers are called to change roles to allow the student to be the investigator while the teacher serves more as a coach in this transformative type of teaching often requiring a paradigm shift.
Classroom examples of new literacies best practice. Because of the rapid
development of new technologies, teachers are often using these new tools in the
classroom before formal research studies are published. This condition affects the
literature in new literacies, so I will first look at some practitioner examples of new
literacies integration. Chase and Laufenberg (2011) challenge teachers to “embrace the
squishiness of digital literacy” noting that teachers are asking what new literacies are,
how they should teach it, and how they can know if their students have learned it (p.535).
Through examples from the Science Leadership Academy for K-12 students and teachers,
the authors provide examples of ways that new literacies integration can transform
lessons at the high school level. An eleventh grader interviews a ninth grader about
important events in his/her life using audio or video recording to capture the rough draft.
Then, the student edits and posts the video file to either the class website, the student’s
blog, or a social networking site. Students along with viewers around the globe listen to
these interviews and post responses. This use of new literacies utilizes authentic content
and a real audience in a very accessible online format. To read online effectively
“students and teachers must learn to read beyond the printed page. They must learn to
read across all those platforms which they can use to create” (Chase & Laufenberg, 2011,
p. 536).

Chase and Laufenberg (2011) provide another example of a value-added lesson
such as I explore in my study using the Observation Protocol for Technology In the
Classroom (OPTIC) rubric. Students evaluate a current news event from three
perspectives: local, national, and world. In groups they locate three articles, read one
individually noting sources and content, compare with others in their group searching for
the truth, and share perspectives with the class. While these things could be done in a regular classroom, the new literacies component requires each student to watch, listen to, or read each referenced source to see how the author used the information in the article. Without access to the Internet and new literacies skills of searching, evaluating, and synthesizing this research would be nearly impossible.

With access to technology, learning is in the hands of the students…The digital aspect of the literacy offers a variety of learning opportunities, formats for creation, and spaces for expression that were not previously available…Having access to technology is not the key. An inquiry-driven curriculum served by technology is critical.” (Chase & Laufenberg, 2011, p.537)

While Chase and Laufenberg present transformative high school examples, my study provides elementary examples of transformative lessons.

To clarify SAMR Redefinition (Puente, 2009) at the elementary level, I present three practitioner classroom examples. Damico and Riddle (2006) studied a beginning fifth grade teacher integrating new literacies in a legacy unit, an inquiry project that challenged students to explore difficult real world social issues presented in their unit of study on The Freedom Train and Harriet Tubman. Students selected a topic of interest, for example prejudice or child slavery; researched using a variety of print and non-print sources; created a presentation to share their learning; and finally found a way to “leave a legacy” by taking action based upon their findings. The class created a CD with digital clips of each student group performing their script, reading their essay, or reciting their poetry. New literacies of student choice, searching, and producing a multimedia presentation redefined this learning goal.
Bogard and McMackin (2012) present a third grade teacher’s 21st century writing workshop model. Students begin their study of personal narratives by writing ideas and memories to spur writing in a notebook. They read books to gain more insights into the topic about which they plan to write. During the planning stage of the writing process students develop stories using digital tools to capture their ideas in their own voice and through their own drawings. The revision stage finds students listening, thinking critically, and conferring as partner collaboration provides feedback. Students incorporate narration, sketches, and a media list citing music, photos, videos, and websites for each slide into digital stories using iMovie. Several dyads in my study utilized an online writing workshop model where students expanded this study using different digital tools and shared online.

Finally, emphasizing the global possibilities for collaboration, Kreul (2005) offers an example of a second grade teacher using technology to change her teaching to be more project-based and student-centered by emphasizing process over product, a goal of my study. Her class participates in several Internet projects, collaborating with students from all over the world. Some of their favorite Internet projects include writing and illustrating acrostic poems, writing online books in writer’s workshop, and participating in tele-collaborative literature circles with college preservice teachers. My study offers an additional international collaboration project at the second grade level.

With this overview of student-centered new literacies integration I will proceed to examine additional factors that influence effective TPACK lessons as created in my study. Realizing that much of the new literacies literature appears in blogs and practitioner publications as above, I now examine some emerging empirical studies that
inform new literacies integration.

Burnett, Dickinson, Myers and Merchant (2006) set up a school-based case study to examine what “technology as transformation” might look like compared to “technology as enrichment,” providing distinction between the two general SAMR levels by which I evaluate lessons in my case study and shedding light on student views of new literacies. Teachers of eight to ten year olds from one rural and one urban school, focused on children’s use of digital literacy as demonstrated using online writing. Pupils in both schools selected artifacts that were important to them and placed them into a shoe box. The researchers randomly selected six students from each school, three boys and three girls, and partnered each with a student of the same sex from the partner school, while remaining students in each class formed groups to support the students selected. Children received email accounts and used an avatar to send emails to their partners attaching digital pictures of their shoebox objects to begin discussion. The groups met face-to-face twice prior to creating their final PowerPoint presentations to share with preservice teachers about what is important to students.

Data included observations of students writing, interviews with students about their perceptions of digital writing, and 120 emails exchanged during the project which provided the samples of digital writing by these eight to ten year olds. The study was more focused on how the students used email than on the quality of their writing. Three themes emerged: (1) transforming the way we write -- the writing process, (2) transforming what we write -- new kinds of text, and (3) children’s perceptions of digital texts. The writing process was transformed when students typed rather than used a pencil, correcting and editing happened simultaneously with writing, and children collaborated
Students created new kinds of text experimenting with digital abbreviations such as “u” for “you.” When creating the PowerPoint students added a variety of visual components to the text including their own drawings, photographs, saved images, and cartoons. They used new literacies skills to add movement and sound, resize, change font and color, and animate. Interestingly, children did not consider email or PowerPoints to be literacy. This study demonstrated how eight to ten year olds use new literacies to communicate using ITCs. My study furthers these results observing even younger students as kindergarteners using these online skills to create PowerPoints.

While these previous examples provided views of teachers empowering students to create using new literacies, some studies show that not all teachers who are using these technologies in the classroom are using them in the most meaningful ways for students. Padron et al., (2012) examined technology use in three high poverty public urban elementary schools. The study found that, despite the reform initiative to integrate more technology into instruction along with financial commitments to purchase technology for schools, the use of technology in these classrooms was very limited. Direct instruction was the only instructional method that was widely used. Group activities and individualized instruction that the researchers hoped to see were never observed. In analysis, the number of computers in classrooms did not seem to be a factor, instead the way they were used or not used was a key factor. Similarly, Lowther and Ross (2003), and O’Brien and Scharber (2010) found that not all students who are on computers are using them in meaningful ways.

Padron et al. propose that the reason their results yielded much lower percentages
of student-centered usage than findings reported in other studies could be because this study observed regular classroom instruction rather than using participants’ self-reported technology use. The authors suggest these results more clearly represent technology use in urban elementary math classrooms for ELLs. The professional development opportunities provided to teachers for integrating technology into the teaching of math did not seem to be enough for teachers to begin to integrate. The authors call for further research regarding the skills teachers need to integrate technology, the quantity and types of technology teachers need for effective instruction, and the types of support teachers need to integrate technology. To meet the need for more support, my study further explores each of these questions through direct observation to determine skills and technology used, and providing coaching support to facilitate the integration process, adding a new participant group of ST/CT dyads.

Two studies incorporated coaching as a support for new literacies integration with iPads, forming a foundation for my current study. Both studies revealed that when teachers and preservice teachers are provided with an iPad and technology support they use the devices for teaching and learning. Wilson and Friedrich (2012) explored the integration of digital technology into a summer literacy education course for graduate students in a university clinical setting; the participants utilized iPads as a tool in coaching, tutoring, and course work. These graduate participants were new to tablet technology and were given iPads during the course to use as part of their course requirements and for personal use. Each participant tutored a local elementary grade student and then coached an undergraduate preservice teacher who tutored a secondary student. All tutored children were one or more grade levels behind in reading.
The graduate students planned, enacted, and reflected upon four levels of iPad integration in the course design: (1) exploring and sharing apps with peers, (2) tutoring struggling readers, (3) coaching undergraduate preservice teachers, and (4) interacting with course instructors. This cyclical collaborative inquiry process resulted in growth in each participant, their tutee, the undergraduate coached, and their university instructors. Participants demonstrated growth moving from no experience using iPads to integrating iPads purposefully and skillfully into teaching and coaching. Based on their scaffolded experiences with technology integration during the course, all participants recommended that iPads become a regular tool in this course and in K-12 classrooms. Technology integration support provided by instructors and collaboration with peers led to successful teaching and learning by all participants.

Findings revealed four recurrent themes: (a) iPads were effective with struggling readers for maximizing instructional time, customizing for the individual child’s needs, and engaging struggling readers; (b) Teacher growth proceeded from personally learning how to use the technology device to applying it for personalized student learning; (c) Using iPads in the course built a foundation for transfer from tutoring to classroom; and (d) iPads provided convenient access to the internet for learning. (Wilson & Friedrich, 2012). My current study built upon the positive effects of coaching for effective new literacies integration into teaching, along with loaning an iPad to participants to use personally and professionally.

The following summer Trainin and Friedrich (2012) conducted a pilot study to examine the influence of new literacies coaching on elementary preservice and inservice teachers in a clinical setting. Undergraduate participants were enrolled in a four-week
summer advanced literacy methods course designed for students approaching their student teaching. Course components included formal class instruction and practicum. Students were divided into two groups and instruction was “flipped.” While one group met with the instructor the other group participated in formal interaction with a technology coach for twenty minutes each day. These coaching interactions consisted of presentations about new literacies, specific apps demonstrations, examples of best practices for new literacies integration, answering questions, and providing one-to-one support to the participants who requested it.

Results indicated that seventy-four percent of teachers reported reduced anxiety with technology integration, ninety-one percent reported they would teach with iPads if available, and eighteen percent reported seeking funding to acquire an iPad. Teacher use of iPads with the children they tutored progressed from using it as a reward for good behavior, to a replacement for traditional methods, to having the children create with multimedia. The preservice teachers reported that the benefits of working with a coach included: (a) the daily presentation of a variety of apps along with applications for teaching (33%), (b) suggested apps on specific requested teaching topics (35%), (c) no longer needing any assistance from a coach (23%), (d) receiving immediate encouragement and feedback, and (e) the short cycle of implementation from demonstration to using it themselves with a child. The authors found that a coach supporting the technology integration process is very important. Additionally, the intuitive nature of iPads helped teachers integrate technology quickly and with very little resistance. This clinical model is one way universities might consider providing professional development. Building directly on results of this study, I designed my...
current study to include a coach, provide an iPad, and extend this model of professional development to ST/CT dyads as the participant groups.

**Summary of new literacies integration.** To take teaching and learning to new levels required in today’s global world, teachers must integrate new literacies consistently in meaningful ways for teaching and learning. While some elementary teachers are beginning to integrate new literacies by requiring students to collaborate and share learning globally, many teachers still teach with direct instruction and have students use technology to practice traditional learning independently. In the next section I will look at the role of professional development to prepare teachers to effectively integrate new literacies into their teaching and their students’ learning.

**Professional Development**

I begin with some general principles of teacher professional development that influenced the types of professional development I implemented in the study. Guskey’s (1995) results-oriented professional development study notes that for teachers to make changes in their teaching practices they need opportunities to apply new skills personally, to practice the new strategy with students, and to collect student data to justify conclusions. Professional growth coupled with positive student outcomes motivates teachers, which in turn may cause a change in their technology integration. Guskey (2003) reviewed lists of criteria for effective professional development and found the following to be most helpful: (a) enhancement of teachers’ content and pedagogical knowledge focusing on subject matter and how students learn that material, (b) sufficient time and resources that are well-organized and purposeful, and (c) collegiality and collaboration for working together, reflecting on methods, exchanging ideas, and sharing
strategies with goals to increase student learning. While implementing professional
development with sufficient time and collaboration in my study, I also added
enhancement of teachers’ technology knowledge along with content and pedagogical
knowledge according to TPACK. These “whats” of professional development informed
my procedures of spending over sixteen hours with each participant, focusing on TPACK
teacher knowledge with applications to student learning, and encouraging collaboration
between dyads and beyond. However this study focused more specifically on the “how”
of professional development: how do student teachers and cooperating teachers
implement professional development, how do they collaborate, how do they utilize prior
knowledge, and how do they integrate technology into their pedagogical content
knowledge. I will focus on the dynamic collaborative inquiry model proposed by Opfer
and Pedder (2011), where teacher learning happens incrementally following a cyclical
pattern, to understand the collaborative process used by dyads in my study.

**Collaborative inquiry.** Collaborative inquiry empowers teachers to actively
construct professional knowledge by implementing learning directly in their classrooms.
A collaborative inquiry model values all participants’ growing understanding and
commitment to improving teacher practice (Anderson & Stillman, 2013). Anderson and
Stillman (2013) encourage research partnerships between principals, teachers of
elementary schools and university teacher educators to support CTs and STs. Rather than
the traditional model of researchers as outsiders who come to observe and evaluate what
is happening, the collaborative inquiry model posits the researcher as leading CTs and
STs together through a series of recursive learning cycles of planning, action, and
reflection (Palmisano, 2013).
I used this collaborative inquiry process in my study as ST/CT dyads set goals for new literacies integration and actively worked together, with my guidance as the coach, to meet those goals. The technology partnership we established responded to the call by Anderson and Stillman (2013) for more intentional partnering with schools and teachers by teacher educators to conduct research together to support collaborative inquiry in CTs, STs, and teacher educators with the goal of improving K-12 student learning. The initial professional development technology conference in my study, described below, was a key ingredient of this partnership, and my role as coach intentionally involved me encouraging dyads within schools through cycles of planning, teaching, and reflecting.

Ongoing professional development is required for meeting the needs of continually changing technologies. The one-day workshop model has not proven effective (Yoon et al., 2007; Kennedy, 1998). Six months after a workshop, less than twenty percent of educators actually use the skills learned there. However if a colleague observed and reflected on the teacher’s practice following the workshop, eighty-five percent of educators are still using those skills six months later (Gawande, 2012). Adding the additional support component makes a significant difference in the effectiveness of professional development. Implementing this research into my study, I as coach assumed the role of a colleague who observed and guided dyad reflection on practice.

Technological Pedagogical Content Knowledge (TPACK). Attempting to add technology knowledge to teacher content and pedagogy knowledge is one example of Borko et al.’s “wicked problem.” Adding a new knowledge base and skill set can be challenging itself, especially one that is constantly changing like technology; but combining it with already existing knowledge bases to plan lessons that could not be
accomplished without the technology can be even more challenging for teachers. Known as Technological Pedagogical Content Knowledge, this is the dynamic place where important learning happens at the intersection of Content Knowledge, Pedagogical Knowledge, and Technological Knowledge. This framework for teacher knowledge is described by Koehler and Mishra (2009) as “a complex interaction among three bodies of knowledge: content, pedagogy, and technology. The interaction of these bodies of knowledge, both theoretically and in practice, produces the types of flexible knowledge needed to successfully integrate technology use into teaching” (p.60). These three components of teacher knowledge can combine in many ways creating differing uses, or no use, of technology in teaching and learning.

Much professional development begins by focusing on technology knowledge alone, demonstrating to teachers how to use various types of technology. Teachers then begin their planning with a technology component that they attempt to fit into an existing lesson, resulting in technology for technology’s sake (Borsheim, Merritt, & Reed, 2008). Next, teachers may begin to use new technology to replace an existing technology or practice. The last step is when a teacher understands each TPACK component and focuses on the dynamic intersection of the three areas of teacher knowledge, where technology transforms teaching and learning processes in new and innovative ways. Examples of TPACK lessons include the Chase and Laufenberg (2011) new literacies best practice lessons described previously where students asked questions, researched answers, combined findings into an online blog or presentation, and posted to receive feedback from global viewers. The teacher planned the lesson within a particular standards-based content area, using student-centered research pedagogy, incorporating
technology to provide feedback from a wider authentic audience: a TPACK lesson.

Chai, Koh, and Tsai (2010) examined preservice teachers’ technological knowledge, content knowledge, pedagogical knowledge as well as the combined TPACK knowledge by surveying a cohort of 889 preservice teachers in postgraduate secondary education program in Singapore. The authors created an online survey and distributed to participants in a pre- (n=439) and post- (n=365) course evaluation format. A technology integration course consisting of twelve two-hour sessions taught preservice teachers to plan meaningful lessons using Information Communication Technologies using the TPACK framework. The first five sessions built pedagogical knowledge, while the next six sessions build technological knowledge through “technology enhanced lessons” presenting a technology tool accompanied by pedagogical uses to students organized in groups by subject area taught. Groups created a final thematic unit project comprised of lessons created applying the technologies to their content area. Because these preservice teachers already possessed subject matter knowledge in their area, the TPACK content area was not taught in this course.

The pre- and post-course surveys noted significant differences between preservice teachers’ perceptions of competence in all four areas: technology, pedagogy, content, and TPACK with moderately large effect sizes ranging from .61 to .69. Technology courses that directly taught technology tools in the technology-enhanced lesson format along with experiential learning of pedagogy raised preservice teachers’ technological and pedagogical knowledge. The process of developing, reflecting upon, and refining lesson designs through multiple formats and the final project produced preservice teacher perceptions of technology integration mastery in their area. The study noted the lack of
clarity among preservice teachers differentiating pedagogy knowledge and content pedagogy knowledge in teaching, as well as viewing ICTs used in any way during a lesson as automatically using TPACK. The authors suggest that future courses further refine the differences between TPACK, technological content knowledge and pedagogical content knowledge to produce teachers who are proficient at integrating technology. In my study I furthered the process utilized by Chai, Koh, and Tsau (2010) to include teaching the lesson, following planning and prior to reflecting in creating TPACK lessons. By emphasizing new literacies integration STs and CTs learned that the TPACK process went beyond integrating a technology such as a document camera to project a traditional worksheet.

Another study of preservice teacher confidence using TPACK focused on perceived growth over a two-year period rather than a single course. Trainin, Friedrich, and Deng (2013) utilized the Technology Pedagogical Content Knowledge Survey in pre- and post-form during the literacy methods block at two universities to evaluate preservice teachers’ perceptions of their ability to integrate technology. Researchers administered the first pre-survey prior to beginning a two-year cycle of professional development provided to preservice, inservice and university instructors through technology integration conferences held on the university campus once each semester and twice each summer. The survey requested scoring on a five-point Likert scale on the continuum of “strongly agree” to “strongly disagree” in the areas of self-efficacy in technology knowledge, pedagogy knowledge, knowledge in various content areas, and overlapping areas including TPACK knowledge. Students also wrote responses to describe effective lessons they saw taught by a university instructor or CT, as well as the best lesson they
taught integrating technology.

Preservice teacher confidence to integrate technology in teaching was fairly high in all areas surveyed, with Literacy and Math somewhat higher in frequency and confidence, and Science and Social Studies somewhat lower in both frequency and confidence. Preservice teachers’ self-efficacy in technology integration from 2011 to 2013 has grown across all four content areas studied. The effect size was very large for most areas, ranging from a high of 2.48 in Literacy with Technology to a low in Social Studies with Technology of 1.84, with an average effect size of 2.09. The study found that the combination of improving the quality of technology integration in Teacher Education, with simultaneous changes in technology integration in partner schools where student teaching is held affected preservice teacher ability to integrate technology into their teaching. The present study extended this professional development for STs and CTs through a technology conference and added follow-up coaching help dyads to reach TPACK teaching as well as a workshop. This study went beyond survey self-report to include direct observations and interviews to allow for triangulation of all data sources.

**Need for change in technology professional development.** To integrate new literacies at the TPACK level while teaching required content, teachers may need to approach lessons differently to provide students opportunities for teamwork, collaboration, and self-directed learning. In a recent report of Teachers’ Use of Educational Technology in U.S. Public Schools (Gray, Thomas, & Lewis, 2010), less than half of new teachers state that they feel well prepared through their undergraduate education and professional development to effectively use educational technology for teaching. And although only nine percent of veteran teachers report being moderately or
well prepared to make effective use of technology for instruction by their undergraduate education, seventy-one percent report that professional development activities prepare them to a moderate or major extent to use technology for effective teaching. However, both veteran and new teachers report their most frequent use of technology with their students is to learn and practice basic skills, which they do about seventy percent of the time in classes (Gray et al., 2010). This application of technology is more of a replacement for traditional methods than innovative uses of technology to stimulate students’ ability to ask questions, search for answers, and communicate learning. The question must be asked: do these results reflect conflicting self-reports of feelings of preparation and actual enactment of technology integration in teaching, or do teachers define technology use for effective teaching as technology used to practice skills? This was an area I explored in my study. CTs and STs rated their technology ability for teaching prior to beginning the study. Then, throughout the semester they reported weekly their best uses of technology for teaching and their students’ best uses of technology for learning revealing participants’ working definitions of new literacies integration.

Cuban, Kirkpatrick, and Peck (2001) explored one variable in the technology integration process -- access to technology. They found that access to computers seldom led to widespread teacher and student use of the technology. Teachers used computers mainly for classroom practice using existing teaching methods rather than adapting new methods that fully utilize the capabilities of the computers and students. Teachers’ curriculum goals determine how they will use technology in teaching. When teachers use direct instruction to present required-content prior to student practice, adding the
technology layer does not significantly change student activity or level of learning at the TPACK level (Mishra & Koehler, 2012). Only four of the thirteen teachers studied by Cuban et al. (2001) said that they changed their classroom significantly because of computer use. Those four teachers noted using technology caused them to become more student-centered in their teaching. They organized their classes differently: lecturing less, using online sources rather than textbooks, giving students more choice, and acting more like a coach than the source of knowledge. My research followed this finding that teachers use technology in methods that match how they teach regularly, however I added coaching to support and guide dyads in new directions.

Another variable that affects integration is feedback. Effective professional development can assist teachers in becoming experts at new literacies integration with deliberate practice accompanied by specific feedback from a mentor (Apple, 2004). This study recognizes that teachers begin technology integration at different stages and advance at different paces. “This evolution refers not to teachers’ progression through a set of technology skills, but rather describes their way of thinking and acting when it comes to integrating technology into their teaching” (Apple Education, 2004, n.p.). The process of planning for effective technology integration involves teachers’ abilities to overlap their content, pedagogy, and technology knowledge to create a new form of teaching and learning at the center of the TPACK model. Integrating the suggested mentor feedback component into the present study and extending the reach to CTs and STs with a coach guiding the collaborative inquiry process of dyads led to TPACK teaching.

In another study Coiro (2005) explored a third variable informing new literacies
professional development -- the variety of teacher backgrounds with technology. Coiro suggests that teachers may be at different comfort levels and need levels of professional development based upon the availability of and experience they have had with technology. Coiro posits that one way to acknowledge these differences is by creating study groups at school where teachers are empowered to take an active role in their own learning. Focusing on teachers’ own questions, needs, and concerns makes the professional development “a more engaging process that builds peer mentoring, self-reflection, teacher decision-making, and collaborative networking” (Coiro, 2005, p.206). Mentoring and collaboration became tools to meet teachers’ individual needs in my study and help them progress in new literacies integration more effectively. Focusing on CT and ST stated curriculum needs and questions about technology integration, I used personalized just-in-time coaching to help dyads meet their goals.

As reading and instruction add digital components, the need for professional development in teaching these new literacies has become more important. The changing nature of online texts makes reading comprehension in online environments complicated and places more processing demands on the reader. Online texts have six interacting elements: reader, text, author, task, context, and technology, all of which are plural (Hartman, Morsink, & Zheng, 2010). Online texts are plural in that they are connected to many other texts and are comprised of information from other texts. Authors are plural because many people may collaboratively write articles online over time or simultaneously in real-time from all over the world. Multiple readers read the same text at the same time for a variety of purposes and tasks. The concept of reading alone has changed in that even a reader sitting at her home computer by herself is “reading alone
together” regarding online comprehension because she knows others are reading the same text and they can discuss the reading online (Jacobs & Gallo, 2002). The technology is even plural in that computers, mobile devices, and Internet speed vary greatly changing the text display; readers can also adjust text size, screen brightness, and other features to their own specifications. While reading online a reader “interacts with elements that actually mutate as she reads” (Hartman et al., 2010, p. 150). Sites accessed today may not be present tomorrow or may have been changed by new authors. Teachers, preservice teachers and children need to learn these new literacies skills to read online, thus requiring changes in content and method of teacher preparation and professional development. My study addresses both CTs and STs during the student teaching semester to begin this new literacies transformation.

Summary of professional development background. Many components of general teacher professional development hold true for new literacies professional development as well. Collaborative inquiry provides a cyclical model of planning, action, and reflection to implement professional development into teaching. New literacies professional development presents a “wicked problem” (Borko et al., 2009) as rapidly evolving technologies bring possibilities to transform learning and simultaneously present challenges for teachers to integrate them meaningfully for student learning with a TPACK focus. Many teachers do not feel prepared and are not integrating technology effectively requiring more effective new literacies professional development. Next, I will report on studies that inform effective professional development in new literacies integration

Effective professional development in new literacies integration. Two studies
examined teacher concerns about integrating new literacies and resulting suggestions for professional development. First, a study by Stolle (2008) examined the teaching practices of secondary content area teachers using new literacies to enhance literacy practices and learning in the context of these new needs for literacy. Sixteen high school teachers of English, Social Studies, and Science volunteered to participate during spring semester. Four of these teachers became primary participants whom the researcher directly observed and interviewed; the other twelve teachers became secondary participants whom the researcher interviewed in four focus groups. Results showed that teachers experience four major tensions integrating these new literacies: sufficient access to technologies, developing technology knowledge with limited professional development and limited time, fear of leaving the comfort of traditional face-to-face literacy practices, and identifying how benefits such as motivation and engagement determine student learning. As a result, Stolle (2008) notes the need for professional development to transform teaching practices with new literacies. Professional development providers need to teach what the new literacies are, teach and practice both new and traditional literacies, and integrate new literacies into teacher education programs; while at the same time finding a way to provide teachers with time, resources, knowledge, and opportunities to collaborate which teachers indicated they needed and desired.

The second study by Hutchison (2012) looked at literacy teachers’ perceptions of professional development that helps them integrate technology into their literacy instruction. This study examined data from eight open-ended questions in a national survey of 1441 Kindergarten through twelfth grade literacy teachers and reading specialists who belonged to an International Reading Association chapter. Four themes to
improve new literacies professional development emerged from teacher data: (a) support including ongoing coaching for individual assistance as well as small groups to support learning beyond professional development, (b) time to explore options, prepare and practice lessons when integrating technology, (c) access to technology for hands-on practice during and following professional development, as well as mentors and online resources, and (d) knowledge by informed presenters teaching ideas for integrating technology into specific content and standards rather than only how to use the technology device. The largest grouping of responses (31%) related to the theme of support, with 45.3% of these responses requesting follow-up support after professional development. Teachers note that most technology professional development teaches only the basics so when they try to use it themselves they do not have anyone to whom they may refer questions. Hutchison discusses the question of how to provide ongoing small group support to teachers and suggests that professional learning communities may be one way to allow teachers to collaborate to pool knowledge and reflect on practice. She suggests that perhaps this could happen online to avoid possible barriers to time, distance, and resources. To date a lack of empirical evidence exists to support online models of follow-up professional development, making this an area for future research (Lawless & Pellegrino, 2007).

Both of these studies call for time, technology, and support for teachers. One way the present study addressed these needs was by supporting teachers through a technology conference with ongoing coaching scheduled at their schools during plan time. In addition, the university loaned each dyad an iPad to assure access to technology in the study.
Collaboration and accountability are essential for new literacies integration.

At a time when the demand for training in new literacies integration is growing simultaneously with classrooms increasingly relying on technology, a new list of standards for professional development calls for more collaborative efforts in schools, along with expanded use of technology and the Internet (Fertig & Garland, 2012). 21st Century people connect through social networks and communicate with a varied network of people (Bereiter and Scardamalia, 2012). To fully utilize these networks for teaching and learning in a global society, both teachers and students will need to be able to collaborate.

In a review of the literature, Mumtaz (2000) found that three out of four conditions necessary for effective technology integration professional development involve collaboration with colleagues. In addition, the author points to the important role pedagogy and teachers’ beliefs play in determining teachers’ decisions to integrate new literacies. The more teachers were involved in professional development activities with colleagues the more likely they were to teach from a constructivist framework using technology in more student-centered learning. Following I look at two studies that support the need for collaboration for new literacies professional development and add the accountability component, two areas I emphasize in my study.

A study by Mouza (2002) describes a professional development program through the Institute for Learning Technologies at Teachers College, Columbia University, for K-12 teachers at sixty-seven schools in New York City to help them use classroom technologies in their teaching. Participants included fifteen teachers from six different schools, from which three were selected for in-depth case studies. This twelve-week
professional development program was divided into two sections: (1) the first eight weeks consisted of weekly two-hour after school workshops where teachers learned to use technology through hands-on activities with discussion of when and how to use them, and time to plan lessons for their classroom utilizing these technologies, (2) the final four weeks required teachers to create projects to integrate technology into their curriculum. In addition, researchers and graduate assistants provided weekly in-classroom support to assist teachers with planning and teaching technology integrated lessons and projects. At the end of the school year all teachers came together to share their projects.

Findings suggested that four factors influenced teachers’ use of technology in the classroom: (1) school administrative support, (2) student population and specific needs, (3) collaboration with other teachers, and (4) availability of school technology resources. Collaboration became the one factor that could most readily be modified to assist teachers. While the goal was to create teams of technology-savvy teachers at each participating school who would continue to collaborate during creation of the final projects, teachers did not communicate between schools as hoped for to impact the whole school district. Professional development programs are needed where teachers collaboratively plan and integrate lessons with technology supported with discussion, hands-on practice and just-in-time support (Mouza, 2002). My study provides an example of a professional development program situated in elementary schools with ST/CT dyads as participants. We utilized a format where dyads collaborated, supported by a coach providing support at the time needed. Dyads shared their technology uses with other dyads at a workshop.

A second study emphasized the importance of accountability to share projects in
addition to collaboration to extend new literacies professional development. Brinkerhoff (2006) studied the effects of a two-year professional development academy on technology skills, computer self-efficacy, and technology integration beliefs and practices. The academy format involved teachers for two years with a rotating schedule of fifteen eight-hour day summer sessions, followed by five inservice days in the following school year, another set of fifteen eight-hour day summer sessions the following summer, and five more inservice days in the second school year. The study examined barriers to professional development in technology that decreased technology use in schools. Findings demonstrated that lack of resources, school policies, skills development, and attitudes all impacted technology professional development and enactment. The academy attempted to address each issue, so teachers volunteered and were paid for attending, presenters shared examples for classroom use, and curriculum reflected the ISTE National Educational Technology Standards (2002) for teachers to help them understand how to plan lessons that are student-centered and require higher-order thinking.

Results showed significant gains in teachers’ self-assessed technology skills and computer efficacy, with little or no change in self-assessed technology integration beliefs and practices. However the authors noted a conflict in teacher self-report as teachers reported in interviews that they felt their teaching *had* changed as a result of the training they received. The study found that participants reported no significant increase in computer self-efficacy between beginning and end of the first summer session. However there was a significant increase from the end of the first summer session to the end of the academy, indicating it took a longer time to change teachers’ feelings toward technology.
Participants noted that working in pairs with other teachers and seeing positive student outcomes reinforced the changes they made in integrating technology into lessons, following Guskey’s (1995) results-oriented professional development study. Suggestions affecting professional development in new literacies integration include: (a) making topics specific to teachers’ interests and needs, (b) using hands-on activities and projects, (c) offering it at times convenient for teachers, (d) holding teachers accountable for implementing their integration ideas by evaluating lessons and student products, and (e) sharing final projects (Brinkerhoff, 2006). The present study utilized many of these suggestions as the coach presented apps and strategies related to requested dyad goals for the week and held dyads accountable for having students create projects using new literacies. Dyads shared these student projects with other participating dyads and me. To overcome the issue of conflicting self-reports, my study triangulated multiple data sources including interviews and observations to allow for a complete picture of new literacies integration to emerge.

**Coaching in new literacies integration.** Teachers need assistance selecting and using technologies to support educational goals. In addition, using technology in more student-centered, constructivist ways can be challenging for many classroom teachers. One way schools are attempting to provide professional development in new literacies integration is through instructional coaches who model new ways of teaching with technology, demonstrate how to use new technologies, and share resources (the journal, 10/1/2004). Because most school budget dollars are spent on purchasing technology and not providing the support necessary to empower teachers to use these devices in ways that transform learning, these technology integration coaching positions that focus on
professional development for teachers are still relatively new and go by many different titles. The literature tends to be more descriptive than research-based:

School-based technology specialists go by many names: technology coordinators, technology integration specialists, technology support specialists, instructional technology coordinators, technology mentor teachers, curriculum technology partners, educational technologists, coaches, expert trainers, technology support coordinators, and site-based technology facilitators - to name just a few. Their job descriptions also vary and range from being primarily computer lab teachers to full-time teacher consultants. (the Journal, 10/1/2004, p.1)

In a study of one school district adding technology integration specialists to most of its schools, Scot (2004) found that in each school these specialists fulfilled multiple roles: meeting with teacher teams and groups of students, writing grants requesting additional technology, and implementing school reforms. They energized whole schools by updating curriculum and pedagogy. Therefore, the most important characteristics that emerged for an effective technology coach included excellent people skills for collaboration, flexibility, teaching ability, and a global perspective even more than technology expertise (Scot, 2004).

McKenna and Walpole (2008) add additional characteristics of effective coaches which also apply to coaching for technology integration. Coaches should utilize principles of adult education, setting an expectation for teachers to take an active role in professional development. By valuing the experience of teachers and encouraging them in the area of technology integration coaches build teacher-efficacy. Coaches teach using classroom-based applications that teachers can apply immediately in their lessons.
Studies indicate the effectiveness of coaching across the disciplines with procedures that inform technology coaching. First, coaching with collaboration supports teacher growth in literacy and teaching efficacy. A recent study explored the effects of a yearlong professional development with coaching on sixth- and ninth-grade teachers’ individual efficacy for teaching literacy as well as their collective school efficacy to affect student performance (Cantrell & Hughes, 2008). In addition, it examined connections between teacher efficacy and implementation of content literacy strategies. Twenty-two sixth- and ninth-grade teachers from eight schools in a small southeastern state volunteered to participate in professional development to learn to use literacy skills to improve students’ academic reading and content area learning. During the school year a coach visited these teachers monthly to support as they implemented literacy strategies they learned at a summer institute. In addition, coaches corresponded via email and phone if needed between meetings. Finally, three full days were devoted to bringing together all volunteers to share teaching ideas and student artifacts. This mixed methods study utilized survey and teacher interview data to explore teacher efficacy development. Results showed significant growth in teachers’ literacy efficacy and general teaching efficacy based on data indicating that coaching and collaboration were two key factors in this growth. I utilized email and added weekly online logs in the current study to extend coaching support beyond the weekly coaching hour.

A second benefit of coaching is that it leads to higher quality implementation of reform practices. Coaches support teachers to implement new methods by helping them negotiate technical challenges (e.g., Matsumura, Garnier, & Resnick, 2010). However, very few studies examine the evolving role of coach as it applies to technology
integration. This deficit may change as states continue to adopt CCSS and other state standards. For example, North Carolina recently joined the Partnership for 21st Century Skills and created a mission statement, goals, and new standards including “every middle school will have a digital literacy coach and every high school will have a digital learning advisor” (Walser, 2011). As more schools and districts add technology coaches, additional data will be available. The present study paints a picture of the way one technology coach supported CT/ST dyads in new literacies integration.

**Models of coaching.** Vogt and Shearer (2011) propose a continuum of teacher support through six coaching models (see Table 1). These models can provide frameworks for the technology integration/digital literacy coaches needed by schools as technology demands increase. In the present study I used the mixed model of coaching: assisting dyads with new literacies integration, suggesting applications and websites to meet planning goals, and observing several lessons where students were using technology and providing feedback to the dyad.
Table 1.

*Coaching Models and Roles*

<table>
<thead>
<tr>
<th>Model Description</th>
<th>Role of Support for Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal Coaching Model</td>
<td>Outside the classroom through conferences</td>
</tr>
<tr>
<td>Mixed Model</td>
<td>Primarily outside the classroom, but some in-class observation</td>
</tr>
<tr>
<td>Formal Coaching Model</td>
<td>Primarily within the classroom</td>
</tr>
<tr>
<td>Peer Coaching and Mentoring Model</td>
<td>Mentoring role in classroom lesson format</td>
</tr>
<tr>
<td>Cognitive Coaching Model</td>
<td>Observe teaching in classroom and provide focused feedback</td>
</tr>
<tr>
<td>Clinical Supervision Model</td>
<td>Evaluate lessons and provide formal feedback on teaching performance</td>
</tr>
</tbody>
</table>


An instructional coach can help build collaboration, new ideas, and energy as long as high-stakes evaluation is not required. Coaches report that teachers will not come to them with questions if it makes them look like they are incompetent teachers. “If my evaluator is going to look at my portfolio, you can be sure I will only include documentation that is positive. I don’t want to look bad” (Kelley, Gray, Reid, & Craig, 2010, p. 281). Coaching can also happen continuously in the classroom as teachers coach one another and students, and students coach one another and teachers (Friedrich & Wilson, 2011). The present study builds upon these coaching foundations. I especially focused on coaching new literacies integration where STs and students may have grown up as digital natives in contrast to the CTs who perhaps did not. Following Campbell’s
law (1976), the main benefit of coaching is the non-evaluative and thus less threatening way of providing support, without worry of failure based on the coach grading any participant, freeing CTs and STs to try new TPACK methods.

**Professional development summary.** The literature shows that several key components make professional development effective (Guskey, 1995, 2003). Recent studies of professional development for new literacies integration highlight similar areas (Hutchison, 2012; Stolle, 2008). To help teachers create TPACK lessons integrating new literacies in student-centered ways, this study emphasized collaboration and coaching to respond to areas teachers report as stressful (Stolle, 2008; Hutchison, 2012). In the final section of literature review I examine the student teaching literature into which I situate the components of collaboration and coaching for TPACK integration in my study.

**Student Teaching Models**

Today’s inclusive classrooms require teachers to co-teach with paras and specialists to meet students’ individual needs. To prepare preservice teachers for 21st Century classrooms, teacher education programs are challenged to provide collaborative experiences for STs (Kamens, 2007). Preservice teachers need opportunities to collaborate throughout their teacher preparation program, as well as actual classroom experiences to collaborate and co-teach. Opportunities to experience collaboration in preservice programs and in practicum settings are the most effective way to help preservice teachers to view teaching as a collegial profession (Yopp & Guillame, 1999). To meet this goal, innovative models of teacher education and especially the student teaching experience are needed.
**Student teaching relationships.** Several studies looked at the relationship between ST and CT and how that relationship influences their instructional planning and roles. Anderson (2007) studied fifty-six ST/CT dyads to find out what role each played in the student teaching experience. Through pre- and post-questionnaires and interviews with ST and CT separately, results showed that the influence of the CT is very important in determining how STs will teach when in their own classrooms. STs said their CTs impact the changes they made in teaching philosophy and methods. STs viewed CTs as having power in this relationship because they evaluate the ST, teach with great knowledge, serve as the authority figure in class, and motivate students who look up to them -- areas in which STs desire to grow. All these factors need to be considered in creating an effective mentoring relationship that facilitates collaboration between STs and their CTs when integrating new literacies into their teaching. In the present study I also interviewed CTs and STs separately to control for this potential power perception. In addition to philosophy and methods changes, I added the technology component that allowed some STs to emerge as the leader in technology knowledge within dyads.

To this CT/ST dyad data, Johnson & Napper-Owen (2011) added the role of university supervisor studying the role of perceptions in student teaching triads. The perspective of each person was analyzed separately. CTs defined their role according to the description given by the university supervisor; however if their role was not clearly explained to them, then CTs defined their role themselves based upon their own ST experience. University supervisors viewed themselves in a variety of roles including evaluator, colleague, resource, and mentor. STs tended to be quiet in triad meetings, because they respect the power of the CT and university supervisor -- an arrangement in
which they noted they felt comfortable. The study confirmed what Caplow (1968) found, that the addition of a third person in a university supervisor role can change the dynamics of the dyad if power and alliance shifts. A collaborative group must be formed by clarifying roles and expectations of each partner in the triad allowing visits by the supervisor to be helpful rather than disruptive. Johnson and Napper-Owen (2011) suggest that dyads should be studied more to see if they can function as the significant unit for student teaching, rather than triads. In the present study although a university supervisor did oversee the ST during the semester, my research did not focus on that role. Instead, I eliminated the evaluative role and inserted myself solely as coach to assist as a resource and mentor to guide the dyad in the added focus of new literacies integration. The focus of my study was on the dyad, responding to the call from Johnson and Napper-Owen (2011) for an in-depth study of dyad grouping.

The following study emphasized collaborative planning by CT/ST dyads while observed by the researcher. E. R. Smith, (2007) used a case study approach to learn specifically about challenges the CT/ST encounter during collaborative planning sessions. While the researcher observed the dyads’ planning conversations, she did not intervene in them. Rather, she scaffolded the mentoring between CT and ST using a new model of joint inquiry and reflection. Smith (2007) suggests that to eliminate the perceived expert-novice roles and facilitate teaching growth in the ST, the CT should be encouraged to empower the ST to share ideas and ask questions during thoughtful planning conversations, understanding that it may lead the dyad to do things differently than the way the CT has traditionally done them. When dyads embark on a semester filled with collaborative inquiry and reflection, both the ST and CT may grow and learn
from each other and the shared activity. This dyadic model directly leads to the present study where ST and CT were both empowered to lead through collaborative inquiry. This model may be especially helpful for new literacies integration as each partner in the dyad may have different knowledge to bring to the discussion about certain technologies, pedagogies, and subject knowledge.

S. M. Smith (2001) takes this idea of learning collaboratively one step further noting that one can increase his/her own technology self-efficacy vicariously by observing another person successfully using technology. This study examined the role of Bandura’s (1997) four sources of influence on self-efficacy, applied here to computer self-efficacy. In order of strength Bandura’s sources of influence include: mastery experiences through repeated successes, vicarious experiences learning from others, verbal persuasion as words of encouragement, and feelings from emotional responses.

Participants in Smith’s study included 210 students from two universities enrolled in a sixteen-week introductory microcomputer course at each university. Participants responded to a Background Questionnaire about their use of computers, as well as a Sources of Computer Self-Efficacy Scale developed for the study with ten questions on each of the four sources of self-efficacy named above. Findings showed that people integrate the four sources when they cognitively process information (Bandura, 1997). In Smith’s study, white males noted mastery experiences as the greatest source of computer self-efficacy; however females and non-white participants recorded vicarious learning as the strongest source. Although not the focus on my study, I incorporated all of the above strategies for increasing computer self-efficacy in CTs and STs, including successfully using technology themselves, vicariously observing the dyad partner use technology.
successfully, receiving words of encouragement to use and for using technology from the coach, and having strong positive reactions to technology use when children achieved. These positive changes in self-efficacy built confidence in CTs and STs to try new ideas with technology.

A recent study by Al-Awidi and Alghazo (2012) further examined the effect of student teaching on preservice teachers’ self-efficacy beliefs for technology integration, also using Bandura’s (1997) four basic sources of self-efficacy. The Emirates University established a comprehensive curriculum to assure that all preservice teachers will be highly qualified in integrating technology into teaching during student teaching. Their study focused on preservice teachers’ beliefs about how they can teach using their technology skills. The authors build on Hall’s (2008) finding that teachers with high technology self-efficacy invest greater time into finding creative ways to integrate technology into authentic student learning experiences. Pre- and post-technology integration surveys were completed by sixty-two female elementary STs. Results showed that all preservice teachers grew in technology self-efficacy during student teaching. These student teachers confirmed Bandura’s theory; mastery experience was the major source of their technology self-efficacy. Interestingly they referred to successful experience integrating technology in teaching before student teaching as the cause. Vicarious experiences observing technology integration through university supervisors, CTs, and peers was the second most stated reason for improved self-efficacy. Encouragement and support from CTs as well as lowering of frustration were also listed as important. Applying these vicarious learning findings to the ST/CT dyads in my study, one partner could learn how to use new technologies, or how to teach with new
technologies, by watching the other partner using it with students. In the context of
ST/CT dyads this thought may be expanded to include the importance of each member of
the dyad learning from each other, the coach, and their students, as a way to stay current
with the ever-changing technologies emerging today.

**Technology integration in teacher education programs.** Duran & Fossum
(2010) present one of very few studies of technology integration in teacher preparation.
The purpose of the Michigan Teachers’ Technology Education Network (MITTEN)
project was to improve the preparation of K-16 teachers so they had more knowledge,
skills, and confidence to integrate new literacies into their teaching and learning. The
teacher preparation program was redesigned in two ways to ensure that preservice
teachers met National Educational Technology Standards for Teachers (NETS*T, ISTE,
2000). First, courses in computing, methods, and content were integrated to allow
authentic practice with technology skills. Second, student teaching was enriched so
preservice teachers learned about technology integration within the classroom context
where they could collaborate with their CTs in experimenting with new technology tools.
The findings showed that this model provided the technical and pedagogical support
needed when attempting to integrate technology. Their results are consistent with
previous research emphasizing collaborative efforts within an authentic setting for
teacher professional development (Lawless & Pellegrino, 2007), and the role of
communities of learning as in developing effective models of technology integration
(Rhine & Baily, 2005). The present study built upon the role of collaboration in ST/CT
dyads to support new literacies integration.

Another study further examined ST technology integration in student teaching
classrooms by comparing intentions and actions. Choy, Wong, and Gao (2009-10) examined a postgraduate teacher education cohort of 118 Singapore STs. During a related technology class these STs designed a student-centered learning project. At three times during the study participants completed a survey about their use of technology in teaching and student-centered learning, their role as teacher or facilitator, their confidence in leading technology integration in school, and the support received from CTs and peers: (1) before the technology course, (2) after the technology course, and (3) at the end of student teaching, with a thirty-eight percent overall return rate. The researchers also included a qualitative component in the study from interviews and observations to triangulate with the quantitative survey data.

Findings showed that STs indicated positive intentions to integrate technology to facilitate student-centered learning in future teaching. However during their student teaching they were actually more likely to use technology to support instruction with additional student practice and as an instructional tool rather than as a way to empower students to ask questions, explore, and create (Choy, Wong, & Gao, 2009-10). Survey data showed that potential internal barriers to technology integration decreased throughout the study as, ST beliefs that technology should be integrated in teaching and their confidence in their technology skills both rose. Opportunities to use and observe CTs use technology in this study raised STs beliefs about use of technology in the classroom as well as their confidence to effectively integrate technology. However it was the external barriers that inhibited STs from actually putting their beliefs into action; interview data reported that availability of technology resources in the classroom influenced STs’ decisions to include technology in their lessons. This finding
contradicted an earlier finding (Ertmer, 1999) suggesting that exterior barriers were easier to recognize and address, whereas internal barriers required a change in beliefs about integrating technology in teaching and take longer to overcome. The present study provided further examples of external barriers causing STs and CTs not to use technology in the classroom. When they needed to reserve laptop carts in advance and bring them into the room to include in a lesson, CTs and STs were less likely to use the technology.

Choy, Wong, and Gao (2009-10) further describe interview data that reveals that STs may not possess adequate pedagogical skills and knowledge of planning to plan lessons using technology in ways that avoid technical issues when teaching. They point to TPACK (Mishra & Koehler, 2006) and the need for STs to develop awareness of technological pedagogical knowledge in order to successfully integrate technology into their teaching. The authors also suggest that teacher educators need to model the process of planning technology-enhanced lessons and the troubleshooting process that allows implementation. The results implied that teacher education instructors must demonstrate to STs how to integrate technology in student-centered ways, in addition to using it as an instruction tool for the teacher. The authors suggest that an implication of the study could be to restructure teacher education programs in Singapore by integrating technology in teaching and learning, including “microteaching and technology-enhanced student-centered learning activities during student teaching” (Choy, Wong, & Gao, 2009-10, p.191). In the present study I supported STs and CTs by coaching how to use technologies themselves and more importantly how to use them in student-centered learning.
Collaborative student teaching models. To prepare teachers for collaboration, they must have opportunities to collaborate throughout their teacher preparation program. Yopp and Guillame (1999) studied a demonstration-presentation lesson model where a university methods instructor demonstrated a technique, then an expert CT applied it in the classroom for preservice teachers to observe before practicing it themselves with a peer, and finally reflecting and discussing. Data showed that this method taught both preservice teachers and expert CTs about collaboration. In this way the university was able to support collaborative activities in schools, where time constraints often hinder collaborative efforts, producing better teaching through partner collaboration and reflection. While this study began the collaborative process during a methods course with associated practicum, the present study expands the classroom experience by integrating new literacies into student teaching.

Cornu and Ewing (2008) state that quality professional experiences in schools must meet two goals: effectively prepare preservice teachers to teach and provide professional development for the CT. They trace the background of student teaching in Australia: (1) the traditional ST/CT/university supervisor triad where STs often chose safe teaching methods when being observed by the supervisor, (2) the reflective practicum where STs were encouraged to reflect on their learning as supervisors and CTs were challenged to release their power role, and (3) the constructivist learning community approach building upon the collaborative nature of teaching where all participants add perspectives to create understanding, and supervision became mentoring through co-learning rather than the traditional hierarchical relationship among triad members. This most recent model strives to prepare teachers to work collaboratively with
other teachers and students. New supervisory practices arose out of these learning partnerships: supervisors work with a cluster of schools over time to develop relationships, university lecturers visit schools to offer expertise meeting with the CTs and administrators as much as the preservice teachers, and university staff continue to develop best practices in professional development. The authors conclude that preservice teachers must be reflective practitioners who are prepared to develop and participate in collaborative learning communities, beginning already in student teaching as they support one another. This constructivist approach to student teaching where CT, ST, and supervisor all contribute ideas in a collaborative format with supervisor functioning as mentor informs the Triarchic Model that emerged during the present study. I introduce a coach as the non-evaluative third member who supports ST and CT. Just as Cornu and Ewing (2008) support CTs in this process, so do the authors of the following study, as do I in the present study. I include these studies to support the design of the present study incorporating coaching the ST and CT.

Busby and Mupinga (2007) further explore needs of CTs that should be met to make student teaching the most beneficial. Student teaching is considered the most important experience in teacher preparation (Arnold, 1995), with the CT spending the most time with and exerting the greatest influence on the ST (Koskela & Ganser, 1998). CTs serve as role models, share strategies, and provide regular feedback, facing often-challenging situations with very little reward. In this study eight male technology education CTs took a survey about the requirements, duties, rewards, and concerns of a CT. Response data informed suggestions to improve treatment of CTs by providing incentives, allowing them to interview STs, surveying CTs to learn of concerns, and
providing workshops to clarify expectations and concerns. One way I supported CTs in the present study was providing ongoing professional development in a technology conference, workshop and weekly coaching sessions to support their new literacies integration.

A final ST model I consider is co-teaching. Kamens (2007) proposes a co-teaching model for student teaching to provide experience with professional interaction and collaboration. This case study formed two teams of participants; each included one general education ST, one dual certification ST (general education and special education), and two CTs. The study was conducted in two consecutive spring semesters in two different school settings in partial-day inclusive classrooms. Researchers collected a variety of data including ST journals, CT notes and feedback, ST email communications, supervisor observation reports, and researcher field notes. Four themes emerged from triangulation of the data on co-teaching. (1) STs felt comforted by peer technological and emotional support. (2) Personality impacted planning when resolving conflicts. (3) STs began teaching individually until CTs and supervisors required a unit created by both STs together. (4) Multiple teachers providing individual support had a positive impact on the children. An unexpected finding was that CTs did not impact STs’ interactions as expected, but rather the two STs collaborated with each other with the CTs functioning more as supervisors. Rather than CTs collaborating with STs as partners, CTs emerged to replace the traditional university supervisor role. My study took the co-teaching finding one step further by pairing ST and CT in creating new literacies projects with children, thus putting both ST and CT at the level of learner collaborating with the support of a coach.
Summary of student teaching literature. Studies in teacher education suggest the need for collaboration experience during student teaching to prepare preservice teachers for roles in today’s inclusive classrooms and schools. They further suggest changes in the role of supervisor/ST to enable integration of new teaching methods without fear of negative evaluation. The need to teach new literacies and twenty-first century skills requires changes in pedagogy and practice that can be discussed and implemented collaboratively by ST/CT dyads during the student teaching experience.

Purpose of This Study

To address some of the calls for more research on new literacies and 21 Century skills, this study examined how ST/CT dyads collaborated to integrate new literacies in elementary classrooms when guided by a technology integration coach. The literature shows that traditional professional development has not sufficiently focused on integrating technology into the curriculum while meeting teachers’ needs (Apple, 2004; Cuban, Kirkpatrick, & Peck, 2001; Mumtaz, 2000). Teachers indicate a lack of ongoing support and collaboration to integrate technology into instruction following professional development (Brinkerhoff, 2006; Hutchison, 2012; Mouza, 2002; Mumtaz, 2000).

In addition, there is a call for research on innovative student teaching models that support collaboration in teacher education programs to prepare preservice teachers with the twenty-first century skill of collaboration (Kamens, 2007). Few studies have looked at collaboration for new literacies integration between student teacher/cooperating teacher dyads (e.g. Duran & Fossum, 2010), a natural and ongoing professional collaboration. Most studies of STs and CTs examine the role of power and hierarchy in the relationship (Anderson, 2007; Smith, E. R., 2007; Huffman, Holifield, & Holifield, 2003), and a few
examine how decisions are made in ST/CT/university supervisor triads (Johnson & Napper-Owen, 2011). Suggestions for further research point to the need to study dyads as the potential standard in the student teaching experience (Caplow, 1968; Johnson & Napper-Owen, 2011). Also, despite the need for technology coaches, few studies can be found examining the role coaches play in technology integration, and none were located where coaches worked with ST/CT dyads for technology integration. We need to know how teachers take professional development experiences and enact them in elementary classrooms to contribute to new literacies pedagogical practice (Miller, 2007). Therefore, this study listened to the voices of ST/CT dyads as they discussed how collaboration with each other and with guidance by a coach, influenced their technology integration.

A need exists in the literature to develop a complete understanding of new literacies integration by ST/CT dyads in elementary schools in an in-depth case study format. By triangulating teacher self-report in interviews and logs with direct observations of actual teaching we can get a more complete picture of new literacies integration by ST/CT dyads in elementary schools. Therefore, the main goal of this research was to expand the base of knowledge regarding new literacies integration in elementary schools by ST/CT dyads.

I situate this study at the intersection of new literacies studies, professional development and innovative student teaching programs. The purpose of the study was to foster collaboration between CT and ST around new literacies integration. For the CT it was professional development in the form of a technology conference, workshop, follow-up coaching, and collaboration with ST around new literacies integration. For the ST is was an innovative student teaching format involving the same technology conference and
workshop, including follow-up coaching, and collaboration with CT around new literacies integration. The concept of both CT and ST focusing together on a new area of emphasis for both "forced" some collaboration that may not have otherwise happened. There are very few studies looking at ST/CT dyads focusing on new literacies integration with the support of a coach, and more research is being requested. Therefore, the purpose of this study was to understand and support new literacies integration by ST/CT dyads in elementary schools.

**Research Questions**

The main research question addressed by this case study is: How is collaboration in new literacies integration enacted between a student teacher and cooperating teacher dyad in an elementary classroom?

The study will also address the following sub-questions to learn about dyad goals, planning, integration, instruction, and assessment.

1. How do student teacher/cooperating teacher dyads enact learning gained during professional development in the classroom?
2. How do student teacher/cooperating teacher dyads have children use new literacies for learning?
3. Does an emphasis on technology integration change the collaborative nature of dyads? If so, how do cooperating teachers respond? How do student teachers respond?
CHAPTER 3: METHODS AND PROCEDURES

This study examined how new literacies were integrated in elementary schools by ST/CT teacher dyads when supported by a technology coach. Creswell (2013) suggests that qualitative research should be used when we need a complex, detailed understanding of the issue, and we want to empower individuals involved with the issue to share their stories. To explore this scenario I designed a qualitative, collective case study (Stake, 1995; Yin, 2003) to develop a picture of what new literacies integration looks like in elementary classrooms that took advantage of this support model. I wanted to discover through interaction with both STs and CTs individually, as well as by dyads, what their experience of new literacies integration was like during student teaching.

Study Design

Baxter and Jack (2008) suggest that two key approaches are prevalent in case study research, that of Robert Stake (1995) and Robert Yin (2014). Stake (1995) states that case study is a design that seeks to understand the complexities of a particular case by understanding its activity within important circumstances. Yin (2014) further defines case study as “an empirical inquiry that investigates a contemporary phenomenon (the “case”) in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident” (p.16). Both approaches state a need for multiple sources of evidence that are triangulated during interpretation to reveal patterns or themes. Both base their approaches on the constructivist paradigm that states truth is dependent upon one’s perspective. One of the advantages of case study research is the close collaboration between the researcher and the participants as they tell their stories (Crabtree & Miller, 1999). The role of coach in this study allowed this close
collaboration to happen naturally as I in the coaching role interacted with dyads on an ongoing basis in multiple formats to hear and see the participants live out their stories.

While there are several approaches for conducting cases studies (Merriam, 1998; Stake, 1995; Yin, 2003), I used a combination of the procedures noted by Stake (1995) and Yin (2009), and suggested by Creswell (2013). They include: (1) determining the appropriateness of case study for the research problem, (2) identifying the case, (3) defining extensive data collection procedures drawing on multiple sources of information, (4) utilizing appropriate data analysis to determine a detailed description of the case followed by an analysis of themes, and (5) reporting the meaning of the case during the interpretation phase, which Lincoln and Guba (1985) call the “lessons learned” from the case. I will now examine each of these case study procedures to demonstrate the rigor of this research.

**Appropriateness of case study.** I used qualitative research to explore new literacies integration with a coach, because it is a relatively new issue with little documentation in the literature. I further narrowed this topic by focusing on how STs and their CTs collaborate to integrate new literacies in elementary schools with the support of a coach. Empirical studies of new literacies integration in elementary classrooms are few in number (Kist, 2005; Luke, 2003); educators and literacy researchers have only recently begun to devise rigorous and systematic studies of new literacies in mobile technologies and online reading comprehension (Leu et al., 2011), and I have not been able to locate studies involving the ST/CT dyad with coach to the point of this writing. Alternatively, I developed a detailed understanding of the phenomenon using case study research.

The exploratory research questions in this study focus on the “what” and “how”
regarding the case (Creswell, 2013). They investigate the phenomena of new literacies integration in elementary schools, about which relatively little is known, lending it well to a case study where an in-depth description of new literacies integration by dyads supported by a coach is sought. Five clearly defined cases were purposefully included to provide opportunity for direct observations and interviews of the ST/CT dyads in classrooms and coaching sessions.

**Identifying the case.** Miles and Huberman (1994) defined the case as “a phenomenon of some sort occurring in a bounded context. The case is, ‘in effect, your unit of analysis’” (p. 25). In this study, I examined the case of new literacies integration by ST/CT dyads working with a coach in elementary classrooms. By its very nature, the ST/CT dyad exists for a predetermined length of time during the student teaching experience, creating a natural bounded system (case) during which integration can occur.

To gain understanding of the process of integration used by dyads working with a coach, I employed a collective case study design (Stake, 1995), because studying multiple cases provided detail about the different contexts in which this process took place as well as facilitated interpretation of multiple forms of data where patterns arose guiding subsequent efforts. This study contained five dyads each bounded by time and space (Creswell, 1998), each of which was explored individually before any comparisons between cases were made (Stake, 2000).

**Context.** The study took place in a large Midwestern public school district where many STs from a large Midwestern public university completed their student teaching experience. The five CTs taught at four different elementary schools in this district, with two teachers located in the same school (see Table 2).
Table 2

*School Demographics and Classroom Size*

<table>
<thead>
<tr>
<th>School</th>
<th>Title I</th>
<th>#Students in School</th>
<th>% Free/Reduced Lunch</th>
<th>% Minority</th>
<th>% Special Education</th>
<th>Dyad</th>
<th>Grade</th>
<th>#In Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bakewell</td>
<td>Yes</td>
<td>258</td>
<td>86%</td>
<td>45%</td>
<td>28%</td>
<td>Mr. Wichert &amp; Mikayla</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ms. Langston &amp; Lauren</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carson</td>
<td>No</td>
<td>487</td>
<td>22%</td>
<td>12%</td>
<td>20%</td>
<td>Ms. Majeres &amp; Sarah</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>Fenton</td>
<td>No</td>
<td>500</td>
<td>22%</td>
<td>15%</td>
<td>15%</td>
<td>Ms. Stout &amp; William</td>
<td>2</td>
<td>24</td>
</tr>
<tr>
<td>Arlington</td>
<td>Yes</td>
<td>763</td>
<td>67%</td>
<td>34%</td>
<td>16%</td>
<td>Ms. Lisko &amp; Angeline</td>
<td>K</td>
<td>22</td>
</tr>
</tbody>
</table>

**Description of the schools.**

**School 1.** Bakewell Elementary (all school, CT, and ST names are pseudonyms), a Title I school with eighty-six percent of students qualifying for free or reduced lunch, was the smallest of the schools represented in the study. Forty-five percent of the students were classified as minority, and twenty-eight percent qualified for special education services. Two CT/ST dyads were located at Bakewell during the study.

**School 2.** Carson Elementary was a medium-sized school in this study with twenty-two percent of its students qualifying for free or reduced lunch. The school was located in a neighborhood where many professional people live and send their children to the school. It had the lowest percentage of minority students of the participating schools.
One CT and her ST in the study were located at Carson this semester.

**School 3.** Fenton Elementary is a middle-sized school most similar to Carson Elementary in size with the same twenty-two percent of students qualifying for free or reduced lunch. The percent of minority students was a bit higher at fifteen percent, and the number of students qualifying for special education was a bit lower at fifteen percent. One dyad in the study was located at Fenton.

**School 4.** Arlington Elementary is a newly designated Title I school. It is the largest school in the study with over 750 students, sixty-seven percent of whom qualified for free or reduced lunch. With thirty-four percent minority students and sixteen percent of students qualifying for special education, teachers at Arlington are quickly transitioning to a changing student population. This school is located the furthest from the city central. One dyad at the kindergarten level from this school participated in the study.

**Participants.** Thirty-five STs from a large Midwestern public university and a matching number of CTs, who served as their mentors and taught at elementary schools in a large Midwestern public school district partnering with the university, were invited to participate in the study. Because the coaching component required weekly meetings with each dyad, participants had to be located in a geographic region close to the university and to other participating schools so I could visit all regularly. Criterion purposive sampling (Miles & Huberman, 1994) was used to select ST/CT dyads, where ST and associated CT both indicated an interest in participating in further collaboration to integrate technology.

Prior to contacting potential participants, the university institutional review board and the partner school district approved all procedures.
Cooperating teacher participants.** Within the five dyads selected for the study, the five CTs taught at four different elementary schools in a large Midwestern public school district where many STs from the participating university complete their preservice professional development. Two CTs were located in the same school. Teacher demographics fairly represent elementary teachers in the region where this study took place. The group of CTs was mainly female with one male, and largely Caucasian with one African-American. Their teaching experience ranged from six to twenty-seven years, representing a total of sixty-six years of combined teaching experience with an average of 13.2 years. Four of the CTs had earned masters degrees, one had a bachelors degree; two additionally held math specialist certificates for a university mathematic program focused on the primary grades. Using the Technology Rating tool (see Appendix I), each rated their ability to use technology personally and in teaching on a scale of 1-5 where 1 was “novice,” 3 was “competent,” and 5 was “expert.” All the females rated themselves at level 3 as being “competent” at their ability to use technology in teaching. The male teacher rated himself at 4 between “competent” and “expert.” All teachers rated themselves the same or lower in ability to use technology for teaching than their ability to use technology personally. Teachers also rated their interest in using technology in teaching. All teachers rated themselves with high interest with mainly scores of 5 and one 4 (see Table 3).
### Table 3

**Cooperating Teacher Demographics**

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Gender</th>
<th>Ethnicity</th>
<th>Age</th>
<th>Years of Teaching Experience</th>
<th>Self-Rated Personal Technology Ability</th>
<th>Self-Rated Technology Ability for Teaching</th>
<th>Self-Rated Interest in Technology for Teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr. Wichert</td>
<td>Male</td>
<td>Caucasian</td>
<td>29</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Ms. Langston</td>
<td>Female</td>
<td>African-American</td>
<td>51</td>
<td>25</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Ms. Majeres</td>
<td>Female</td>
<td>Caucasian</td>
<td>30</td>
<td>8</td>
<td>4</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Ms. Stout</td>
<td>Female</td>
<td>Caucasian</td>
<td>39</td>
<td>17</td>
<td>3</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Ms. Lisko</td>
<td>Female</td>
<td>Caucasian</td>
<td>30</td>
<td>8</td>
<td>4</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

**Student teacher participants.** ST demographics of the five students volunteering to participate in the study also reflected the student population in the elementary education program at this university. The STs were largely female, with one male, and all Caucasian. None of the STs had any formal teaching experience beyond practicum experiences in methods courses for the undergraduates, and no teaching experience for the two Masters students who had been prepared for related but different careers as undergraduates. One Masters student had a Bachelor’s degree in family and consumer sciences and child development studies, and the other had a Bachelor’s degree that allowed her to work with children and adolescents with emotional and behavior problems. There were three undergraduate and two graduate students in the study ranging in age from 22 to 34 (see Table 4).
Table 4

*Student Teacher Demographics*

<table>
<thead>
<tr>
<th>Student Teacher</th>
<th>Gender</th>
<th>Ethnicity</th>
<th>Age</th>
<th>Student Type</th>
<th>Self-Rated Personal Technology Ability 1 low-5 high</th>
<th>Self-Rated Technology Ability for Teaching 1 low-5 high</th>
<th>Self-Rated Interest in Technology for Teaching 1 low-5 high</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mikayla</td>
<td>Female</td>
<td>Caucasian</td>
<td>34</td>
<td>Masters</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Lauren</td>
<td>Female</td>
<td>Caucasian</td>
<td>30</td>
<td>Masters</td>
<td>4</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Sarah</td>
<td>Female</td>
<td>Caucasian</td>
<td>22</td>
<td>Undergraduate</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>William</td>
<td>Male</td>
<td>Caucasian</td>
<td>22</td>
<td>Undergraduate</td>
<td>4</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Angeline</td>
<td>Female</td>
<td>Caucasian</td>
<td>22</td>
<td>Undergraduate</td>
<td>3</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

The undergraduate students attended the associated technology conference with their CTs, however the Masters students were in other classes during this time and did not attend the conference. Each of these five STs demonstrated a commitment to learning more about technology integration with their CT as they volunteered to be part of the study. After being accepted into the study, they rated themselves on their ability to use technology in teaching, generally with much lower scores than CTs gave themselves. Three STs, including both Masters students, rated themselves in the “novice” range at 1 or 2, one ST rated herself 3 as “competent,” and the male ST rated himself 4 between “competent” and “expert” at using technology in teaching. As with the CTs, three STs rated themselves the same and two rated themselves lower in using technology to teach compared to using it personally. They also rated their interest in using technology for teaching: two noted the highest level of interest, two a medium level of interest, and one a relatively low level of interest. The undergraduate STs noted taking a course at the university reading clinic where they used iPads to tutor struggling readers. All
undergraduate STs took an introductory technology course, however none referenced it throughout the study.

**Dyad 1 CT.** Mr. Wichert was a fourth grade teacher, in his sixth year of teaching, piloting the district’s new reading series that year. He enjoyed learning about technology integration and was innovative with a sense of immediacy, utilizing ideas I presented in coaching the same day. Interested in pursuing school administration, Mr. Wichert appreciated the creativity possible in charter schools. He viewed himself as a “facilitator of cognition” not a teacher, helping students focus on their metacognition to learn by understanding what is going on in their minds. “Students learn by interacting with themselves and others,” through cooperative learning and by teaching others (Mr. Wichert, Beginning Interview, 10-2-12).

Building upon his philosophy of learning, Mr. Wichert found a way to integrate the ideas learned in three sectionals he attended at the Technology Conference into one unique math component, which he used throughout the semester and beyond. He initiated the concept of “flipping the classroom” to facilitate cognitive processing. Children learned the new math concept before coming to class by watching a screencast Mr. Wichert made and tweeted to students and parents daily. In response, children created their own problems rather than work provided problems to demonstrate understanding. Then, in class children taught others using the new procedure. Mr. Wichert wanted children creating to help them reach the highest level of Bloom’s Taxonomy. His main goal for the study was to set up a flipped classroom, which he accomplished by the second week of the study. He next requested assistance and encouragement from the coach to keep it going, convinced himself and the school staff that it was a good idea, and
collected data to support this new type of teaching and learning. Additionally, he set
goals to make guided reading come alive, to teach from India via Skype, and to learn
more uses for technology.

**Dyad 1 ST.** Mikayla student taught with Mr. Wichert for the year. She graduated
with a bachelor’s degree in Family and Consumer Sciences with Child Development
Studies several years ago. While working with young children for two and a half years,
Mikayla realized that she wanted to help children learn and succeed at life as a teacher.
She entered the Masters plus teacher certification program to fulfill those goals. As a
graduate ST, Mikayla observed and assisted in the classroom Thursdays and Fridays each
week before teaching this fourth grade class on Thursdays and Fridays.

Mikayla rated herself as a 2 on a scale of 1-5 with 1 being “novice” and 5 being
“expert” regarding both her ability to teach using technology and her interest in using
technology for teaching. Students in the Masters plus program have very little to no
teaching experience prior to entering their 14-month program, so her teaching ability in
general was at the novice level. She also rated herself as a 2 in ability to use technology
personally, so both using technology and teaching were new for Mikayla. She rated her
interest in using technology in teaching as 2, noting she did not attend any professional
development in this area in the last three years. Graduate STs did not attend the
Technology Conference prior to the study because their class schedule differed from the
undergraduate capstone courses. These ratings made Dyad 1 the most diverse in
perceived technology ability and interest, with Mr. Wichert highly competent with high
interest in using technology in teaching and Mikayla feeling less competent and with
lower interest in technology use.
Mikayla believed students learn through hands-on interactive activities with discussion, where they ask questions and find information on their own. She viewed the teacher as one who assists students in locating answers to their own questions. To achieve a high level of learning, Mikayla set goals for the study that complimented Mr. Wichert’s goals. She also wanted to incorporate technology, create Educreations and Twitter accounts so she could “flip the classroom,” as well as learn classroom management techniques by creating respectful relationships with students similar to Mr. Wichert’s.

Dyad 2 CT. Ms. Langston taught third grade at Bakewell. She brought 25 years of teaching experience to this Dyad, from other states as well as different school districts within this state. She taught in middle class suburban schools before beginning at Bakewell, a Title I school where she commented that she loves the diversity. “I just feel like I can relate, coming from my background to the Title I situation, and I want to just pay it back. You know, people invested in me and so I want to do the same thing for my students” (Ms. Langston, Beginning Interview, 10-10-12). Ms. Langston suggested her greatest strengths were creativity in teaching and building relationships with students, giving them input as they learned together through play that exposed students’ creative side. She set goals to learn how to use iPads meaningfully in the curriculum, as well as how to effectively use the many websites that her school required her to use with her students. When I presented a writing idea using AudioNote to record student pre-writing ideas, Ms. Langston immediately responded, “Oh, I could do that even tomorrow. Have a couple kids do that just to model it” (Ms. Langston, Beginning Interview, 10-10-12). I proceeded to answer her many questions and demonstrate so she could begin using AudioNote the next day.
**Dyad 2 ST.** Lauren, a Masters student who expressed feeling overwhelmed by the demands of both coursework and teaching, was her ST. She earned a bachelor’s degree as a licensed Marriage and Family Therapist who wanted to use this expertise as a classroom teacher. She listed her greatest strengths as empathy, listening and caring. Building upon her background dealing with children and adolescents with emotional and behavioral problems, she viewed students as learning best “when they feel supported and they feel they can do it...which unfortunately doesn’t happen a lot” (Lauren, Beginning Interview, 10-10-12). Lauren’s goals focused on using and feeling more comfortable with technology hardware, such as how to hook up the laptop so she could also turn on the document camera.

Dyad 2 presented an interesting mix of self-perceived technology ability and interest. Lauren used technology personally and rated herself 4 on a scale of 1-5, with 1 being low and 5 being high, but because of her lack of teaching experience she rated herself lowest as 1 “novice” in ability to integrate technology into her teaching. However, she rated herself 3 “medium” on the same scale regarding her interest in using technology to teach. Her CT Ms. Langston rated herself lower than Lauren in ability to use technology personally at 3 “competent,” but higher in ability to use technology in teaching 3 “competent.” Ms. Langston also rated herself higher than Lauren in interest in using technology in teaching at 4 “medium-high.”

**Dyad 3 CT.** Ms. Majeres taught second grade at Carson Elementary. This was the first year she had an LCD projector and document camera in her classroom, so they were new to her. Her previous school did not have much technology and no computer teacher, so she was not used to using technology in teaching. She rated herself 4 in her ability to
use technology personally, but 3 in ability to use technology in teaching. Ms. Majeres was not sure about what technology was available to her at Carson and had not checked any out.

We could, I could try to get, well we have a computer lab that’s available in the mornings, but we are a non-testing grade so we are way low down on the totem pole for access to that. And I think we have two mobile labs, but it’s the same thing. We are down on the totem pole, so if, even if I had it reserved and had a lesson planned, and all of a sudden fifth grade needed it to practice or to use it for the district comprehensive assessment, I’m out. And I don’t get to use it... And so I don’t think about whole class computer usage...I think small group or single kid at a time computer usage. (Ms. Majeres, Beginning Interview, 10-9-12)

She described her strengths as managing the class and working with struggling readers by scaffolding lessons from simple to complex. “I don’t think up (gifted), I think struggling” (Ms. Majeres, Beginning Interview, 10-9-12). She believed students need multiple opportunities using multiple modalities to learn best; they need to see it, say it, and write it so it sticks in their brain. Based upon her situation, Ms. Majeres set goals to use differentiated text to work with gifted students and to begin using technology as both a planned tool and flexibly on the fly.

Dyad 3 ST. Sarah student taught with Ms. Majeres and admired her as a teacher, selecting her as CT after doing a practicum with her the year before. Sarah described her greatest need as classroom management that she noted as a strength of Ms. Majeres:

My teaching style is a lot like Ms. Majeres’ because I look up to her so much and I’ve gotten so much out of observing her...The kids love her and they’re able to
catch on to everything she has to say. And she involves the kids the whole time...helping by asking intellectual questions. And that’s what I’ve caught myself doing too because I think that it helps them think about it (content).

(Sarah, Beginning Interview, 10-9-12)

Sarah described her almost nonexistent technology background, homeschooled where her Mom limited TV to thirty minutes per day and no video games. Consequently, Sarah did not indicate much interest in technology rating herself as 3 on a scale of 1-5, with 1 being low and 5 being high. In terms of her ability to use technology in teaching, she rated herself 2 on the same scale. Sarah explained that she found it difficult to try new things with technology and hard to motivate herself to try. Once she did, she noted enjoying using technology, providing an example from her course at the university reading clinic where she observed her tutee enjoy listening to himself read. In student teaching Sarah spent time hooking the computer up to the document camera:

That’s a good example of how technology scares me a little bit. Even with that, I was nervous to put it (projector connector) on my computer because, I was like, “I don’t know if this is simple enough for me.” But I feel like whenever I try to use technology it doesn’t work for me, I don’t know if I’m just prone to not (be successful using technology), and I’m sure that’s just something that’s gotten into my head. (Sarah, Beginning Interview, 10-9-12)

Sarah began teaching all day almost immediately. Ms. Majeres limited the time she was in the classroom to provide opportunities for Sarah to troubleshoot all classroom problems on her own and for students to view Sarah as the teacher. This provided more solo teaching practice for Sarah, a goal of hers to improve her confidence, and enabled
Ms. Majeres to explore and use new apps with individual struggling readers in the back of the room. Both Ms. Majeres and Sarah talked about needing accountability to actually use technology, not just think of a good idea but actually try it in teaching.

**Dyad 4 CT.** Ms. Stout taught second grade and set technology integration as her personal and classroom goal for the year:

> We’ve been told that by our principal, by other teachers, by everyone really, in the news, that’s where we’re going. Eventually I’m guessing we may not even have textbooks anymore, you know it’s going to be all technology. And knowing that the kids come in already knowing so much, I need to be up there with them. I feel like I need to know more about it, how to use it. And the main thing is I don’t want to use it as a bribe or as a “Oh, if you do good you can use this.” I want to use it as, “This is how we integrate it all the time.” (Ms. Stout, Beginning Interview, 10-2-12)

Her school received a Whole Child Network award that aligned it with a partner school in Guam. Ms. Stout expressed interest in learning how to further this partnership during the semester using technology.

Ms. Stout described her strengths including seventeen years of teaching experience in special education and elementary education, a master’s degree through a special first year teaching program under a master teacher, loving children and enjoying coming to school everyday, and challenging herself to keep growing for the children. Ms. Stout participated in the study because she worked with a ST that semester and the email invitation highly recommended it to these CTs. She desired to learn to use the iPad for teaching and learning, “Because I never even picked one up until I went to the
Technology Conference!” (Ms. Stout, Beginning Interview, 10-2-12). While she rated her ability to use technology personally and professionally at 3 “competent,” she rated her interest in using technology 5 “high” on a scale of 1-5 with 1 low and 5 high.

**Dyad 4 ST.** Ms. Stout’s ST, William, rated both his technology skills for teaching and his interest in using technology for teaching at the highest level of 5 on the same scale of 1 to 5. He described himself as “a hands-on teacher who likes to see his students interacting with each other and the teacher to learn in creative ways so they can retain information” (William, Beginning Interview, 10-6-12). His stated strengths included adapting material for students who did not understand a concept and thinking outside the box to challenge students on-the-spot when lessons concluded before planned. William’s goals for the semester included finding ways in any subject to integrate technology, to get students using the Internet and introduce them to new ways of learning.

William and Ms. Stout attended the Technology Conference together and both attended the session on *eBook Magic*, the first app they both used with students. William envisioned collaborating with Ms. Stout, drawing on both of their strengths for the good of students:

I think it (collaboration) would be great because I know that I might have, maybe an idea that would be great to use when integrating technology, but then maybe she has something that she would add to improve it, make it better, a better experience for the students. And so working back and forth we can kind of take the feedback off each other and kind of form a great lesson using technology.  
(William, Beginning Interview, 10-6-12)
**Dyad 5 CT.** Ms. Lisko was a kindergarten teacher who expressed her confidence in her personal technology skills. She described her family as “loving technology” with a husband who is a computer programmer, two children ages 2 and 4 to whom they gave their old cell phones so they could play games, and herself who enjoyed using technology personally. Confidence, flexibility, and technology were stated as three of her top strengths along with approachability and a positive attitude. Ms. Lisko described herself this way, “I’m a fly by the seat of my pants person. I’ll do whatever. I’ll just try it and if it doesn’t work we’ll try something different. Whatever you want us to try we’ll try” (Ms. Lisko, Beginning Interview, 10-3-12).

She rated herself as 3 “competent” at using technology in teaching, but had never set a goal for technology. She set a general classroom goal for this year to individualize the curriculum to accommodate individual student needs, noting that it was easier when she co-taught with her para so they could split students up to better meet individual needs. Ms. Lisko knew that there was a laptop cart in the school and said she would love to use these computers in her classroom, but she just didn’t know what to do with them. There was one student computer in the classroom that she used for a work station where students went to a couple websites like Starfall.com and ABCya.com to practice literacy skills. She believed students learn by doing in hands-on fashion, focusing on their strengths and accommodating as needed. She shared that this was how she learns as well, “I have to do it myself!”

Regarding her interest in using technology in teaching, she rated herself highest at 5. This commitment led her to set a goal for the study of figuring out ways she could integrate technology more fully into literacy, and then all subjects. She noted a high
interest in seeking out opportunities to learn more about technology integration. In the last three years she attended two professional development opportunities regarding technology in teaching: the Technology Conference that began this study and a district professional development on Professional Learning Networks where Edmodo in the district was introduced briefly and online groups like Twitter were mentioned.

**Dyad 5 ST.** During the semester of the study Ms. Lisko worked with Angeline as her ST. Angeline was an undergraduate student teacher whom I had coached on technology use in teaching during a course at the university reading clinic the previous summer. Angeline led a sectional on creating e-books at the Technology Conference they attended together, something she learned how to do during the summer course and related tutoring practicum. Like Ms. Lisko, she rated herself as 3 “competent” at using technology in teaching, and 5 “high” regarding her interest in using technology in teaching, only their self-rating of personal use of technology differed where Angeline rated herself 3, one level lower than Ms. Lisko rated herself. Overall the members of Dyad 5 viewed themselves as very similar in technology ability. However, their preferred method of integrating technology differed: whereas Ms. Lisko was a “try it” user ready to try anything, Angeline was a “plan it” user preferring to collaborate to plan lessons together. Angeline stated that her greatest strengths were organization, communication, and collaboration. She gave the example of how she appreciated Ms. Lisko working in Planbook.com so both of them could plan in the same location.

As a ST, Angeline set two general goals: classroom management and working with Special Education students. She wanted to figure out what motivates each child and their best method of learning, whether hands-on, group work, individually, or by teaching
others. She believed real learning happens when students are involved in hands-on productive activities that engage as many students as possible. To this end, she set a goal for the study to use technology in a productive manner in activities that engage students and help them learn.

In the last three years Angeline participated in two professional development opportunities regarding technology in teaching: the university Technology Conference she attended with Ms. Lisko and at which she presented, along with a senior-level university course at the university reading clinic using the iPad while tutoring a student with reading challenges. She expressed a high level of interest in using more technology in teaching and in seeking out further opportunities to learn about technology integration.

**The technology conference and grant.** A federal Improving Teacher Quality state grant provided partial funding for the associated Technology Conference and half-day dyad workshop in this study. The goal of the grant is for partner recipients to design and implement professional development to improve teachers’ methods thereby promoting student achievement (U.S. Department of Education). In this study the grant provided substitute teacher reimbursement for CTs attending the Technology Conference and workshop, lunch for all participants for the workshop, and a fifteen-dollar iTunes gift card for purchasing apps for each dyad.

Each of the CT participants was invited to attend a Technology Conference at the university with his or her ST at the beginning of the student teaching semester. The conference offered multiple sectionals on new literacies integration in elementary schools presented by elementary teachers and education specialists in a hands-on format, allowing participants to practice using the technologies in a supportive environment.
All CT participants attended this conference demonstrating their interest in learning more about new literacies integration in teaching, as well as committing to build a relationship with their ST by participating in a shared professional development activity. The exceptions were Mr. Wichert and Ms. Langston who attended the conference but their Masters level STs did not because they were not part of the undergraduate student teaching group. These two STs were involved in a Masters plus Teaching Certification Program in Elementary Grade Teaching. While undergraduate STs were in the classroom Monday through Friday all semester, Masters level STs were in the classroom only Thursday and Friday during the first semester when I implemented this study, then Monday through Friday second semester. At the beginning of this study I had not thought about including these Masters level student teachers because they were not part of the undergraduate student teaching workshops and their student teaching goes all year, rather than just the one semester program followed by undergraduates. However, when two of their CTs attended the conference and both indicated an interest in participating in the follow-up coaching with their ST, I sent invitations to these dyads to participate in the coaching study as well.

Before attending the Technology Conference, none of these CTs had any exposure to an iPad. At the conference they were introduced to iPads, educational apps, and specific teaching ideas using them. Each expressed an interest in further coaching to help them integrate these new ideas into their teaching.

**Role of the researcher.** My role in this qualitative collective case study was that of participant as observer (Gold, 1958; Creswell, 2013). In addition to collecting and analyzing data in my role as researcher, I also functioned as an active participant in the
role of technology integration coach with these ST/CT dyads. The participants were aware of my role as researcher, but my primary role in this setting was that of coach. As the technology integration coach I visited each school weekly, formed relationships with school personnel, and worked to move the dyads forward with their technology goals. With an emphasis on collaboration as I met with dyads to share ideas that could help them meet their weekly goals, I positioned myself as a coach who was also a collaborative partner and co-learner. Because of the newness of the iPad and its use in the classroom, a collaborative effort developed to share apps and teaching ideas; so coaching took on both formal and informal aspects.

**Qualifications for coaching.** I was prepared for this role initially through a study of a technology integration coach in two elementary schools (Friedrich & Wilson, 2011). Through observations and interviews I learned about the role of a technology coach. Five themes emerged: (1) working side-by-side with teachers to meet curriculum goals by integrating technology, (2) presenting what teachers want, when they need it, with encouragement, (3) using technology to motivate students to achieve at a high level motivates teachers too, (4) creating learning situations where students can help other students with technology through collaboration and troubleshooting, and (5) organizing learning so students analyze online content through dialogue. I continued to collaborate with this coach over a three-year period. This experience of studying and learning from a technology coach helped me plan coaching activities in the current study that met the needs of teachers.

In my second technology coaching experience, I coached graduate students enrolled in an innovative course at a university reading clinic where iPads were used by
participants as a learning device, a teaching device, and a coaching device (Wilson & Friedrich, 2012). Six Masters students and two Doctoral students with no previous experience with iPads or tablets were enrolled in the course and were the participants in this study. I demonstrated how to use the iPad and some apps for tutoring, and participants shared apps with each other on a daily basis. Results demonstrated that teachers quickly learned how to use the iPad to personalize instruction for struggling readers when they took it home to practice and they learned to use a few apps and apply them directly to student levels and interests. Because of this study (Wilson & Friedrich, 2012) I knew that I needed to provide iPads to the dyads in the current study to ensure that they had access to the technology I wanted them to use, and so they could take them home to use them. The study also demonstrated to me that teachers want assistance applying apps directly to their teaching, informing the way I would conduct coaching sessions in this study.

In the summer prior to the current study I copiloted a study (Trainin & Friedrich, 2012), providing me a third experience with coaching. Participants included twenty-five elementary preservice teachers (one male), four preservice speech pathologists, and five inservice teachers enrolled in a literacy course at a university reading clinic. The participants were given iPads to use in tutoring at-risk readers in an associated practicum. Instruction was “flipped” for the university students, providing formal interaction with me as their technology coach for twenty minutes per day. I demonstrated various apps with examples of best practices for teaching and learning and provided one-to-one support to individual preservice teachers who requested support. Because findings showed that coaching made a difference with these teachers in their integration of
technology using the iPad, I was motivated to begin working with dyads in the current study.

**Procedures**

**Permissions.** The Institutional Review Board (IRB) granted permission for the study, determining there were no risks involved for human participants (see Appendix A). The public school district in which the participating teachers taught also gave permission for the study to be conducted in their schools. Participants individually gave consent for me to work with them for the study.

**Selection of participants.** I gave CTs and STs two opportunities to volunteer to participate in the study. First, I sent an email invitation to each ST and corresponding CT separately explaining the study and encouraging participation. I selected dyads where both the ST and the CT replied to the email noting interest in the study. Second, all undergraduate STs attended an associated technology conference on campus as part of their senior capstone course; their CTs were invited to attend the conference with the ST to provide a common experience in technology integration for the dyad. Following the conference, all attending CTs and STs individually completed an online conference evaluation that polled them on their interest in participating in follow-up coaching to assist with integrating new literacies in their classrooms. Both ST and CT had to reply positively noting interest in the study for the dyad to be considered. Because of the perceived power structure in the ST/CT dyad unit, I used the process of contacting potential participants separately to ensure that neither dyad member could force the other to participate. A follow-up email was sent to CTs and STs who indicated interest on the conference evaluation, asking them to complete an attached Letter of Consent with self-
identification information if they were interested in participating in the study.

Next I examined the volunteer documents from both groups to match up pre-assigned dyads where both the ST and CT had separately volunteered for the study. Both ST and CT indicated an interest in working with a coach to integrate new literacies during the student teaching semester in a total of five dyads. All five dyads were selected for the study and were notified via the email address they submitted when volunteering that they had been selected to participate in the study.

**Coaching procedures.** I explicitly spent eight weeks of the study in the field with participants as coach (see Table 5) building relationships, mentoring in new literacies integration, and learning from each other.

Table 5

*Time in Field with Participants*

<table>
<thead>
<tr>
<th>Type of Contact</th>
<th>Time Frame for Contact</th>
<th>Frequency of Contact</th>
<th>Length of Contact</th>
<th>Total Hours of Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interview</td>
<td>October &amp; December</td>
<td>2 times individually 1 time as dyad</td>
<td>30 minutes per interview</td>
<td>1.5 hours each</td>
</tr>
<tr>
<td>Observation</td>
<td>October-December</td>
<td>4 times each dyad</td>
<td>60 minutes per observation</td>
<td>4 hours each</td>
</tr>
<tr>
<td>Dyad Coaching Sessions</td>
<td>October-December</td>
<td>Weekly for a total of 8 weeks</td>
<td>60 minutes per session</td>
<td>8 hours each</td>
</tr>
<tr>
<td>Workshop</td>
<td>November</td>
<td>1 half day</td>
<td>3 hour workshop</td>
<td>3 hours each</td>
</tr>
<tr>
<td><strong>Total Contact Time Per Participant (N=10)</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>16.5 hours each</strong></td>
</tr>
</tbody>
</table>
**Mixed model of coaching.** As the technology integration coach, I became the support person for these dyads collaborating to integrate new literacies in the classroom. This role was an important part of the study, because it provided the supported practice and accountability necessary for successful implementation of professional development (Garet et al., 2008; Guskey, 2002, 2003; Kelley, Gray, Reid, & Craig, 2010). I incorporated many of Guskey’s Characteristics of Effective Professional Development (2003) into my coaching including: follow-up, support, and pressure; enhancing teacher content knowledge and pedagogical knowledge; promoting collegiality and collaboration; meeting on-site; and stressing student learning outcomes. To accomplish these goals I followed Vogt and Shearer’s (2011) Mixed Model of Coaching, incorporating both formal and informal methods. Formal coaching procedures that I implemented included: assisting dyads in goal setting, co-planning lessons that integrated new literacies into teaching and student learning, and leading professional development. I held dyads accountable for integrating new literacies by having them complete weekly online Teacher Technology Logs and then meeting with them weekly to discuss their progress and needs.

Informally, I functioned as a knowledgeable co-learner, sharing apps and teaching ideas while also gaining ideas about new apps and other technology uses in the classroom from these CTs and STs as the semester progressed. As the coach, I was able to work alongside the dyads to experience the process of new literacies integration with them. I also created an online community of support for all dyads to share ideas and ask questions of both me and the other dyads as a way to extend the collaboration.
**iPads for dyads.** Unexpected by the participants, at our first meeting I gave one iPad to each dyad to use throughout the study, except the two dyads at Bakewell who shared one iPad. Presenters at the technology conference introduced participants to iPads and applications for education that I wanted them to practice using in the classroom after the conference. None of the participants had used an iPad before the conference, none owned an iPad, and none had any tablets in their classrooms. To enable them to practice what they had learned at the conference with their students, dyads needed to have a device. With the variety of technology available in classrooms today, coupled with the variety of uses ranging from a teacher tool to a student device for innovation (K-12 Education Week, 2013; Hutchison, & Reinking, 2011; Trainin & Friedrich, 2012), providing an iPad assured that each CT/ST dyad would have access to at least one iPad to integrate new literacies into their teaching and student learning.

**Weekly logs inform coaching sessions.** Each CT and ST individually completed a weekly online Technology Use Log indicating information about integration of new literacies: (a) best examples of how they used technology in their teaching and how students used it in their learning; (b) apps, websites, and technologies used; (c) how or if they collaborated; (d) time spent learning technologies to prepare to teach lessons using those technologies; (e) goals they set for new literacies integration; and (f) how I could best help them (see Appendix B). After reading these logs, I prepared a weekly agenda for the coaching session held in the classroom of each dyad. I introduced specified apps to all dyads, then I personalized the sessions to assist individual dyads in meeting goals. The basic format of these sessions included: (a) relationship building, collecting essential documents including letters of intent, and explaining study formats including online
Technology Use Logs (b) overviewing new literacies integration from the previous week, (c) discussing the importance of new literacies for students, (d) encouraging dyads in their collaboration for integration, (e) reviewing ideas shared in last week’s coaching session to allow for questions or examples of use, and (f) demonstrating new apps and websites with specific teaching ideas to meet dyad needs. This format allowed me to provide continued follow-up, support, and accountability.

**Further contact.** As a coach I had the unique opportunity to work with both CTs and STs in a non-evaluative manner; they could respond and try things without fear of it affecting a grade or my opinion of them. I met with participants individually at the beginning of the study to hear about their individual goals and needs. They completed weekly online technology logs individually to empower each participant to share his/her experience from his/her own perspective in words that would only be seen by me. I observed dyads teaching lessons to discover the various ways dyads integrate new literacies into the actual classroom environment. Through the Edmodo (www.Edmodo.com) educational social platform and email, each participant had continual online access to me as coach, and to each other as learners going through a shared experience.

**Workshop.** I provided a half-day workshop for all dyads to meet each other and receive additional professional development. The Teacher Quality Grant provided for a half-day substitute teacher to each classroom to enable the five dyads to attend the workshop. Each dyad was also given a fifteen-dollar iTunes gift card, so they could download some apps they wanted to use in the classroom.
The half-day workshop schedule (see Appendix C) included creating eBooks using iBooks Author, creating graphs using a Google Docs spreadsheet, troubleshooting technology questions, providing apps as requested, learning how to score student technology projects using a provided rubric, introducing and individually registering for Edmodo, discussing new literacies, and clarifying coaching parameters assuring participants I was not grading them in any way but was there to support and encourage. The highlight of the workshop was each dyad sharing a way they were integrating new literacies into the classroom. These ideas that other teachers were actually doing appeared to really motivate the rest of the teachers, and in the weeks to come, dyads tried several of these ideas in their own classrooms.

**Data Collection**

To answer the research questions, multiple data collection tools were used (see Table 6). In this section I will describe each tool, its use in the study, any validation procedures conducted, and type of data gathered.
### Table 6

**Measurements for Research Questions**

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Measurement Tools</th>
<th>Data Collected</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Question</strong> How is collaboration in new literacies integration enacted between a student teacher and cooperating teacher dyad in an elementary classroom?</td>
<td>Beginning Interview Protocol</td>
<td>Interview quotes</td>
</tr>
<tr>
<td></td>
<td>Exit Interview Protocol</td>
<td>Written transcriptions of interviews</td>
</tr>
<tr>
<td></td>
<td>Technology Use Log</td>
<td>Field notes of observations</td>
</tr>
<tr>
<td></td>
<td>Observation Protocol</td>
<td>Narrative comments</td>
</tr>
<tr>
<td></td>
<td>OPTIC Observation Protocol</td>
<td>Numerical scores</td>
</tr>
<tr>
<td></td>
<td>Email documents</td>
<td>Emails</td>
</tr>
<tr>
<td></td>
<td>Edmodo posts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coaching Session notes</td>
<td></td>
</tr>
<tr>
<td><strong>Subquestions</strong> How do student teacher/cooperating teacher dyads enact learning gained during professional development in the classroom?</td>
<td>Beginning Interview Protocol</td>
<td>Interview quotes</td>
</tr>
<tr>
<td></td>
<td>Exit Interview Protocol</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Coaching Session notes</td>
<td></td>
</tr>
<tr>
<td>How do student teacher/cooperating teacher dyads have children use new literacies for learning?</td>
<td>Technology Use Log</td>
<td>Narrative comments</td>
</tr>
<tr>
<td></td>
<td>Observation Protocol</td>
<td>Field notes of observations</td>
</tr>
<tr>
<td></td>
<td>OPTIC Observation Protocol</td>
<td>Numerical scores</td>
</tr>
<tr>
<td></td>
<td>Coaching Session notes</td>
<td>Artifacts</td>
</tr>
<tr>
<td>Does an emphasis on technology integration change the collaborative nature of dyads? If so, how do cooperating teachers respond? How do student teachers respond?</td>
<td>Beginning Interview Protocol</td>
<td>Written transcriptions of interviews</td>
</tr>
<tr>
<td></td>
<td>Exit Interview Protocol</td>
<td>Narrative comments</td>
</tr>
<tr>
<td></td>
<td>Technology Use Log</td>
<td>Field notes of observations</td>
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<tr>
<td></td>
<td>Observation Protocol</td>
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</tbody>
</table>

Yin (2014) recommends six types of information to collect when conducting a case study: documents, archival records interviews, direct observations, participant observation, and physical artifacts. He further notes that data from these multiple sources of evidence need to “converge in a triangulating fashion” (p.17). Multiple sources of evidence in this study included: interviews, observations, online logs, student technology.
projects with rubrics, and documents over a semester to capture the richness and detail of
the experience as well as assure construct validity (Yin, 2014), (see Table 7).

Table 7

*Data Sources by Number*

<table>
<thead>
<tr>
<th>Data Source</th>
<th># Collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Documents – Emails</td>
<td>197</td>
</tr>
<tr>
<td></td>
<td>with participants</td>
</tr>
<tr>
<td>Documents -- Edmodo Posts</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>(18 by participants, 34 by coach)</td>
</tr>
<tr>
<td>Beginning Interviews</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>(5 student teachers, 5 cooperating teachers)</td>
</tr>
<tr>
<td>Exit Interviews</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>(5 student teachers, 5 cooperating teachers, 5 dyads)</td>
</tr>
<tr>
<td>Observations</td>
<td>20</td>
</tr>
<tr>
<td>Coaching Session Notes</td>
<td>38</td>
</tr>
<tr>
<td>Technology Use Logs</td>
<td>68</td>
</tr>
<tr>
<td><strong>Total # Data Sources</strong></td>
<td><strong>400</strong></td>
</tr>
</tbody>
</table>
**Documents.**

**Email.** I collected email exchanges as an ongoing record of conversation between each participant and myself throughout the semester for analysis. Participants contacted me electronically when they had questions or requested assistance. I then triangulated these documents with other data sources to check for confirming data or rival hypotheses. By establishing a chain of evidence (Yin, 2014) to attend to all data, I formed a more complete picture of this case.

**Edmodo.** To encourage ongoing collaboration across dyads, I created an Edmodo educational social networking site (www.Edmodo.com). I set up a small group for each dyad, and one large Tech Dyads group for all participants together. At the workshop I helped everyone set up a profile and join the two groups. This site served as a message board for communication and collaboration throughout the semester. It was a way that I shared websites, teaching videos, and lists of recommended apps with the group. Participants also shared websites, apps, and examples of student projects. Data collected here included posted messages of introduction, resources shared, and questions asked and answered.

**Interviews.** I conducted audiotaped 30-minute beginning and exit face-to-face interviews separately with each student teacher and cooperating teacher in a quiet area at the school where they teach to learn about the new literacies integration experience of the dyad from each participant’s point of view. Each member of the dyads separately participated in one semi-structured interview protocol utilizing open-ended questions during the first coaching session (see Appendix D). The goals were to establish the relationship between myself and each participant while learning about their teaching
beliefs and goals for new literacies integration. This information enabled me to coach each dyad in their goal areas.

Each participant separately took part in a second semi-structured interview protocol at the end of the semester. I structured the interview protocol to learn: (a) how the dyad worked together with new literacies integration, (b) how coaching related to this process, (c) what student projects exemplified their best new literacies integration, (d) how they define new literacies at this point, (e) their perception of their growth over the semester, and (f) their goals for continued technology integration (see Appendix E). By interviewing each participant individually, all participants could tell about their experiences from their point of view free from the innate power structure of mentor/student, potentially causing student teachers to respond as they think their cooperating teacher would want them to respond.

The dyads participated in the final interview together at the end of the semester. Questions tapped into: (a) what was most helpful about having a partner while integrating new literacies, (b) what they did that helped students learn the most, (c) what technologies they found most helpful in teaching, (d) how the added focus on technology affected them as a ST/CT dyad, and (e) what suggestions they would give to incoming ST/CT dyads to make their new literacies integration most beneficial for teacher and students (see Appendix F). This dyad interview format provided insights into how each dyad worked together through their responses verbally as well as nonverbally.

All interviews were audio-recorded and then transcribed word for word. I employed a transcriptionist who was not affiliated with the university, school district, or participants to help with transcribing the audio-recordings. Transcribed interviews totaled
15 hours of audio-recordings from interviews.

**Observations. Observation protocol.** Four one-hour classroom observations were conducted (see Table 8) using the Observation Protocol in the classroom or computer lab while the dyad was teaching a lesson integrating new literacies (see Appendix G). The protocol focused the observation on: (a) the objectives of the lesson for content and technology, (b) teacher pedagogy, (c) student use of new literacies, (d) relevant quotes, and (e) unexpected events. I took field notes in these areas that I typed following the observation and then examined for meaningful overlap of content, pedagogy, and technology following the TPACK model (Mishra & Koehler, 2006).

Table 8

*Observation Dates, Subjects, and SAMR levels by Dyad*

<table>
<thead>
<tr>
<th>Dyad</th>
<th>Observation 1</th>
<th>Observation 2</th>
<th>Observation 3</th>
<th>Observation 4</th>
<th>Observation 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11-19-12</td>
<td>11-19-12</td>
<td>12-11-12</td>
<td>12-12-12</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Literacy</td>
<td>Math</td>
<td>Writing</td>
<td>Spelling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SAMR-A</td>
<td>SAMR-R</td>
<td>SAMR-R</td>
<td>SAMR-A</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>11-6-12</td>
<td>12-4-12</td>
<td>12-4-12</td>
<td>12-7-12</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Integrated</td>
<td>Math</td>
<td>Math</td>
<td>Spelling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Studies</td>
<td>SAMR-R</td>
<td>SAMR-M</td>
<td>SAMR-A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SAMR-M</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>11-7-12</td>
<td>11-15-12</td>
<td>11-15-12</td>
<td>11-26-12</td>
<td>11-27-12</td>
</tr>
<tr>
<td></td>
<td>Spelling</td>
<td>Literacy</td>
<td>Science</td>
<td>Writing</td>
<td>Writing</td>
</tr>
<tr>
<td></td>
<td>SAMR-A</td>
<td>SAMR-A</td>
<td>SAMR-A</td>
<td>No Tech Used</td>
<td>SAMR-A</td>
</tr>
<tr>
<td>4</td>
<td>11-19-12</td>
<td>11-26-12</td>
<td>12-3-12</td>
<td>12-6-12</td>
<td>12-7-12</td>
</tr>
<tr>
<td></td>
<td>Literacy</td>
<td>Integrated</td>
<td>Math</td>
<td>Literacy</td>
<td>Word Work</td>
</tr>
<tr>
<td></td>
<td>SAMR-M</td>
<td>Studies</td>
<td>No Tech Used</td>
<td>SAMR-R</td>
<td>SAMR-S</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SAMR-A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>11-13-12</td>
<td>11-14-12</td>
<td>11-15-12</td>
<td>11-16-12</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Literacy</td>
<td>Literacy</td>
<td>Literacy</td>
<td>Integrated</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SAMR-R</td>
<td>SAMR-R</td>
<td>SAMR-R</td>
<td>Studies</td>
<td>SAMR-A</td>
</tr>
</tbody>
</table>
OPTIC. In addition, the Observation Protocol for Technology Integration in the Classroom (OPTIC, Northwest Regional Educational Laboratory, 2004) rubric measured the variety of technology integration pedagogy focusing on elements of student learning: (a) independent choice, (b) involvement in planning, (c) ethical behavior, (d) effective use of technologies, (e) focus on objectives, (f) technology embedded in curriculum, (g) problem solving and higher order thinking, (h) engagement, and (i) uses of technology for activities that could not otherwise be easily done (see Appendix H). I selected the OPTIC because it provides criteria to describe effective technology integration that focuses on student learning. It provided the clearest description of the intersection of content, pedagogy, and technology in the TPACK model that focuses on student-centered learning. This rubric was developed to evaluate the use of technology in classrooms because of a lack of clarity in defining innovative technology integration. The focus of the rubric is on how teachers empower student use of technology to do things that they could not do easily without the technology, compared to technology use as a replacement of traditional instruction, such as completing a worksheet online.

Validation procedures. The OPTIC underwent an internal and external review by content experts and practitioners before field-testing for validity in five school districts comprised of sixteen elementary schools, two middle schools, and one high school. Although originally created for principals to have clear criteria for classroom observations of technology integration, the protocol was tested by a variety of observers including one superintendent, eight principals, four technology coordinators, and seven teachers. The final protocol was then field tested for reliability in two statewide studies finding that the protocol can produce consistent judgments from a variety of observers
(OPTIC, Northwest Regional Educational Laboratory, 2004). I contacted the creator of the rubric to learn that the OPTIC continues to be used as a clear descriptor of innovative technology integration. The Northwest Educational Technology Consortium Review and Field Test report can be viewed at [http://www.netc.org/images/pdf/field.test.pdf](http://www.netc.org/images/pdf/field.test.pdf)

**Online logs.** The CTs and STs individually completed The Teacher Technology Log, a self-reporting online tool to gather information about dyads’ use of technology, collaboration, areas of learning, and goals (see Appendix B). I created this measure to collect the desired information directly from the dyad, and based it upon models of teacher logs in the literature, which are mostly used daily to evaluate pedagogy (Ball, Camburn, Correnti, Philps, & Wallace, 1998; Muckert, Moni, & Jobling, 2003) or weekly to reflect on the sequence of lessons (Van Kraayenoord, Miller, Moni, & Jobling, 2009).

The online log is created in Qualtrics (2012) to allow STs and CTs to independently enter data directly into the database, reducing researcher data entry errors and allowing ease of entry and analysis by both teachers and researchers. The log captured: (a) the number of lessons taught using technology per week, (b) the number of hours of technology integration by the dyad per week, (c) the subjects in which technology was integrated, (d) what collaboration, if any, was used to integrate technology, (e) best examples of technology use by the dyad for teaching and by students for learning, (f) goals for new literacies integration for the coming week, and (g) ways I could assist the dyad in meeting its goals. Descriptive statistics on the quantitative data collected demonstrated changes in individual dyads over time; aggregated data showed trends over all dyads over time. Weekly responses to open-ended questions provided examples of the new literacies integration experience in participants’ own words.
Validation procedures. The Teacher Technology Log was field-tested in a pilot study at the reading clinic associated with a university where I served as the technology integration coach to assist preservice and inservice teachers in teaching new literacies to struggling readers (Trainin & Friedrich, 2012). Each week the inservice and preservice teachers enrolled in the course completed the online Teacher Technology Log to indicate how they were using technology to teach new literacies. They provided their best examples of how they used technology as teachers and how their students used technology as learners. After week one I noted that responses explained what they did with technology but did not always note what specific technologies they were using, so I added a question asking for specific applications and technologies used during the week. I also added a question about how much time teachers spent preparing to integrate technology. I was curious to learn if integrating technology was adding to the teachers’ preparation time and if that would change with practice. I also considered the other alternative that perhaps organizing all teaching materials on one tablet device might streamline preparation. Both preservice and inservice teachers reported that they felt this tool provided an accurate picture of their actual process of new literacies integration in teaching. Final instrument validation was completed in the current study by cross validating log reports with observations.

Data Analysis

To prepare the data, another recorder and I transcribed audio-recordings of interviews word for word. I organized each type of data by dyad and date and entered into ATLAS.ti (2012). To explore the data I used the Miles and Huberman (1994) method of coding. First, I read through all data to get a sense of the content, identifying sentences
as the determined unit of measurement, relating to each research question and assigning each a code. Next, I reread all data sources using open coding, assigning codes created initially as well as adding axial codes as needed. I then reread the data a third time analytically, looking for patterns and answers to research questions. After combining codes into themes, I reread the data again using a selective coding process to look for quotes and examples from participants to illustrate each theme, as well as contradictory evidence to inform themes. Rich and thick quotes (Creswell, 1998) were selected to give voice to the participants as they explained new literacies integration from their point of view. Sorting by codes, I was able to examine data first by each individual dyad case and then across cases.

Descriptive statistics analyzed numerical data from logs and rubrics to look for trends over time. I triangulated this data with the narrative data arranged chronologically by dyad. By overlapping codes, I analyzed the data using direct interpretation of each dyad case, while then looking further for patterns between dyad cases (Creswell, 2013). A detailed picture of new literacies integration emerged in themes, supported by quotes and examples from multiple sources (see Table 9).
Table 9

Side-By-Side Comparison Joint Display

<table>
<thead>
<tr>
<th>Theme</th>
<th>Interviews</th>
<th>Observations</th>
<th>Logs</th>
<th>Emails</th>
<th>Coaching Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Collaboration models that work</strong></td>
<td>“Maybe an idea that would be great to use when integrating technology but then maybe she has something that maybe she would add to improve it, make it better, a better experience for the students” (William, Beg Int, 10-10-12)</td>
<td>Ms. Lisko teaches whole group while Angeline assists individual students with logging in, cutting and pasting, etc. (Dyad 5, 11-15-12)</td>
<td>“My CT and I worked together to pull our students aside and work with them as they created an e-magic book” (William, 11-2-12)</td>
<td>“I want to meet with Mikayla tomorrow and we'll set up some times and get back to you” (Mr. Wichert, 11-7-12)</td>
<td>Ms. Langston mentored Lauren about uses for each app I showed in their teaching. (Dyad 2, 11-18-12) Ms Majeres noted that she has been playing with the apps all day while Sarah teaches! (Dyad 3, 10-18-12)</td>
</tr>
<tr>
<td><strong>Teacher &amp; student growth with empowerment</strong></td>
<td>“Allowing them to ask questions about things, and find out, kind of information on their own, but it’s guided” (Mikayla, Beg Int, 10-11-12)</td>
<td>“Roletha will turn it, she knows what to do.” When child notes that it is dark on the screen. Ms. Langston affirms that students know how to work the technology. Teacher checks the volume on the iPad after student has audio cord plugged into iPad. (Ms. Langston, 12-4-12)</td>
<td>“I feel they can go above and beyond what they’ve learned in class and be able to create and post from anywhere” (Mr. Wichert, log, 12-7-12).</td>
<td>“Hope you enjoyed our Skype session today! The students were really excited to share what they have done” (Ms. Stout, 1-28-13)</td>
<td>While writing eBooks one girl noted “I want to show you...She took more ownership in it than if I was doing it all.” The little girl clearly articulated the process needed (Ms. Stout, 12-3-12)</td>
</tr>
<tr>
<td><strong>STs &amp; CTs both become learners when tech integration is added focus</strong></td>
<td>“I probably wouldn’t have suggested the apps to Ms. Langston. I probably would have just come across them and kept them to myself.” (Lauren, Exit Int, 12-6-12)</td>
<td>“It takes a long time for kindergarteners to log in and navigate the Internet” (Dyad 5, 12-12-12)</td>
<td>Created lesson on Educreations but didn't match what students needed, so ST and I started a new lesson on the iPad on-the-spot (Mr. Wichert, 11-7-12)</td>
<td>“I did iPad mini training sessions with the students while my ST was teaching” (Ms. Stout, 9-23-12)</td>
<td>ST helped CT set up Skype account, CT helped ST plan Skype session (Dyad 4, 11-14-12)</td>
</tr>
</tbody>
</table>
Validity and Reliability.

Validity. Several qualitative validation techniques assured that the information obtained and the ideas represented by the researcher and participants were accurate, ensuring validity of results. First, I attempted to collect multiple sources of evidence from each dyad to accurately and completely describe the phenomenon of new literacies integration as experienced by these dyads working with me as coach. Triangulation of these data sources within dyads initially, and then across dyads, provided corroborating evidence to inform each theme (Miles & Huberman, 1994). Triangulating data helps the researcher deduce which of the options presented is most likely to be true by examining multiple methods with offsetting biases to investigate the phenomenon (Greene, Caracelli, & Graham, 1989/2008). Disconfirming evidence also provided a more detailed picture of new literacies integration across dyads. Second, I used member checking, taking summaries of themes back to dyads, asking them to indicate if the themes accurately reflected their experiences (Creswell & Plano Clark, 2011). Third, semi-structured interviews with open-ended questions helped me focus on the participants’ ideas and statements so themes emerged out of their relayed experiences, not my preconceptions. I included their rich, thick descriptions so readers could make decisions regarding transfer of findings to other settings (Lincoln & Guba, 1985). Fourth, I spent much time in classrooms coaching and observing dyads teaching using new literacies. These activities gave me personal experience to understand and interpret participant comments.

Reliability. Several procedures maximized reliability or trustworthiness. First, inter-coder agreement was used in analyzing data. Following the basic procedure
suggested in Creswell (2013), an independent coder and I coded representative interview quotes and observation transcripts, using a codebook I developed containing codes with their meanings. After reading through the codebook, we scored one interview transcript together, discussing our reasoning for code selection. Then, we each scored one additional interview to determine inter-coder agreement. Where we differed, we discussed reasoning and then combined some codes to create a clearer code. Then, we scored one observation transcript together using these clearer codes and discussing SAMR levels, prior to scoring an additional observation transcript individually. The goal was to establish an 80% agreement in coding on these transcripts, as recommended by Miles and Huberman (1994). Actual inter-coder agreement for this study was 84%.

Second, I took the stance of a coach who collaborated with each dyad to integrate new literacies into elementary teaching. As a coach, I clarified my role as a supportive colleague rather than an evaluator. I spent over sixteen hours with each participant in face-to-face contact, with additional time spent interacting online through logs, email and Edmodo. I believed this approach would build relationships of trust and mutual respect and allow for honest sharing of the experience by participants. I tried to model the very collaboration I hoped that each dyad would use as they undertook the task of new literacies integration. Through coaching, modeling, and relating with dyads, I hoped to get reliable and trustworthy data that would paint an accurate picture of new literacies integration in elementary schools by student teachers collaborating with their cooperating teachers.
CHAPTER 4: RESULTS

This chapter presents the story of new literacies integration in each of the five dyads studied to answer the primary and subsidiary research questions. Qualitative results of the triangulation of interviews, observations, logs, coaching notes, emails, and documents provide descriptions of collaboration in new literacies integration between ST and CT dyads in elementary classrooms. To preserve the unique collaboration model of each dyad, I organized the progression of new literacies integration for each dyad separately to show change throughout the student teaching semester (see calendar in Table 10). I examined the results using the TPACK framework through the lens of coaching for new literacies collaboration.
Table 10

Calendar noting weeks of study with corresponding dates and key events

<table>
<thead>
<tr>
<th>Week #</th>
<th>Date</th>
<th>Key Event(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Study</td>
<td>September 10, 2012</td>
<td>University Technology Conference</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Recruitment of participants</td>
</tr>
<tr>
<td>Week 1</td>
<td>September 30-October 1, 2012</td>
<td>Dyads confirmed</td>
</tr>
<tr>
<td>Week 2</td>
<td>October 7-13, 2012</td>
<td>Beginning interviews</td>
</tr>
<tr>
<td></td>
<td></td>
<td>First coaching session</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dyad receives iPad</td>
</tr>
<tr>
<td>Week 3</td>
<td>October 14-20, 2012</td>
<td>Coaching session</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Online Technology Use Logs begin</td>
</tr>
<tr>
<td>Week 4</td>
<td>October 21-27, 2012</td>
<td>Coaching session</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Online Technology Use Logs</td>
</tr>
<tr>
<td>Week 5</td>
<td>October 28-November 3, 2012</td>
<td>Half-day Workshop</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Online Technology Use Logs</td>
</tr>
<tr>
<td>Week 6</td>
<td>November 4-10, 2012</td>
<td>Coaching session</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Online Technology Use Logs</td>
</tr>
<tr>
<td>Week 7</td>
<td>November 11-17, 2012</td>
<td>Coaching session</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Online Technology Use Logs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Observations begin</td>
</tr>
<tr>
<td>Week 8</td>
<td>November 18-24, 2012</td>
<td>Observations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fall Break</td>
</tr>
<tr>
<td>Week 9</td>
<td>November 25-30, 2012</td>
<td>Observations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LRA Conference</td>
</tr>
<tr>
<td>Week 10</td>
<td>December 2-8, 2012</td>
<td>Observations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exit Interviews</td>
</tr>
<tr>
<td>Week 11</td>
<td>December 9-15, 2012</td>
<td>Final Observations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Semester ends</td>
</tr>
</tbody>
</table>
**Dyad 1 “Complete Immersion”**

CT Mr. Wichert and ST Mikayla formed Dyad 1. They worked with fourth graders, the oldest students in the study, at Bakewell Elementary; the school with the highest percentage of free or reduced lunch, minority students, and special education students in the study. Already busy with fourth grade assessments, Mr. Wichert also piloted the district’s new reading series this year. The Dyad’s self-ratings made Dyad 1 the most diverse in perceived technology ability and interest: Mr. Wichert highly competent with high interest in using technology in teaching and Mikayla feeling less competent and with lower interest in technology use. Mr. Wichert mentored Mikayla in technology integration and teaching, collaborating with her to plan, teach, and reflect; scaffolding to enhance her confidence and competence. He shared his reasoning for working in this way with his ST:

I wasn’t doing anything last year compared to this year. It’s been kind of a whole paradigm shift. If this is where we’re going with education, then we need to get going. If this is what I truly believe, then I need to at least try to champion it to whomever I influence...You kind of just have to dive in. It’s almost just like full immersion.” (Dyad 1 Exit Interview, 12-7-12)

Although Mikayla described feeling a bit overwhelmed at the beginning, she followed her CT’s lead adding, “I know it’s going to be very beneficial for me. It’s exposing me to a lot of things that I wouldn’t probably otherwise get” (Mikayla, Beginning Interview, 10-11-12). Mikayla reported that as a dyad they were always collaborating, “Mr. Wichert would say, ‘OK, we are going to do this in the classroom.’ It forced/challenged me to learn because I had to teach and help kids...It set up
opportunities for us to reflect and reassess” (Mikayla, Exit Interview, 12-7-12). With this joint determination, supported by scaffolding, and utilizing continuous collaboration, Dyad 1 demonstrated what full immersion with new literacies integration looked like in an elementary school (see overview in Figure 3).

Figure 3. Dyad 1 Timeline. Overview of highlights and developmental progressions across the semester. The Transitional Week arrow indicates SAMR-Redefinition of lessons to student-created and shared online.

Mr. Wichert implemented ideas as quickly as I presented them. He accomplished his stated main goal for the year of “Flipping the Classroom” already in Week 2, and expanded this screencasting process in Week 3 to teach from Puerto Rico. Soon Mikayla began creating Educreations math videos, while Mr. Wichert tweeted them out to students who viewed them and created math problems to demonstrate learning. Week 7
represented a paradigm shift for Mr. Wichert as he empowered students to create and post their own videos, a goal he and Mikayla had discussed for several weeks. He created a class Edmodo site as a safe location for students to share their videos with each other, parents, and school staff. Understanding that her teaching experience would include “Flipping the Classroom,” Mikayla proactively suggested an alternative to the traditional lesson plan required in her Math Methods course, taken simultaneously with student teaching. Course requirements determined many of the teaching strategies this masters ST implemented, so broadening the options enabled Mikayla to integrate new literacies in new ways and broadened the teaching program at the same time:

I haven’t heard of the term new literacies, (at) which I’m kind of surprised. I thought I would have, being in the program...I talked to my math professor, I brought it up in class about “Flipping the Classroom” in our cohort, in our college classroom, and so he said if anyone was interested in doing that, they could do that for their lesson plan instead of the traditional one. So then I decided, well I’m obviously going to be (“Flipping the Classroom”), I’ll obviously choose that because we’re going to be doing that here. (Mikayla, Beginning Interview, 10-11-12)

Dyad 1 began collaborating immediately. They planned lessons together, included both CT and ST in these lessons, and discussed long-term goals including how to move students from watching Educreations videos to creating one. CT and ST planned lessons together modeling all three areas of TPACK Teacher Knowledge: Technology Knowledge, Pedagogy Knowledge, and Content Knowledge. Mr. Wichert collaborated with Mikayla to build each TPACK area in intentionally scaffolded designs through
planning, co-teaching, and reflection. Both invested time to learn, and I began to realize that these teachers found a way to make technology integration happen rather than listing reasons why it could not happen. Mr. Wichert shared a university iPad with the other CT at Bakewell, while Mikayla used a university iPad her masters program loaned to her for the semester. For an overview of the time spent by CT and ST preparing to use technology and teaching with technology for each week see Figure 4. During the semester Dyad 1 continued to use about ten main apps and websites they found most helpful (see Appendix J), now empowering students to create with them.

![Dyad 1 Mr. Wichert & Mikayla](image)

*Figure 4. Dyad 1 Hours with Technology. Indicates hours spent planning and teaching with technology by CT and ST of Dyad 1.*

Mr. Wichert empowered and encouraged teachers and children with whom he worked. The SPED teacher with whom he collaborated bought an iPad and volunteered to make math videos along with Mr. Wichert and Mikayla (for an overview of collaboration see Figure 5).
Collaborative inquiry for technology integration provided modeling and scaffolding for full immersion. Both CT and ST described a process of collaborative inquiry involving bouncing ideas off of each other to plan, working together to enact the lesson in various ways, and then bouncing ideas following and sometimes during the lesson to evaluate and answer questions. Mr. Wichert enacted teaching ideas immediately, modeling for Mikayla how teacher Technological, Pedagogical, and Content Knowledge can be focused to create dynamic learning opportunities for children. For example, using the “collaborate” button Mr. Wichert could post a question, to which students and ST all blogged through the reading series website. Mr. Wichert scaffolded new literacies integration for Mikayla through this process, asking her to reply back to students on this class blog prior to creating a blog on her own.

Mikayla commented upon the effective way Mr. Wichert empowered children
with tasks they accomplished on their own or with help from peers: “I’m not going to tell you what the assignment is. You have to go to Edmodo. Your directions are there,” (Mikayla, Exit Interview, 12-7-12). Mikayla further commented on the need for complete immersion regarding new literacies integration, “You have to say you’re going to do it and then you have to do it. You can’t say, ‘Oh I’d really like to…’ but this is holding me back. You have to just do it” (Dyad 1 Exit Interview, 12-7-12).

Dyad 1 discussed mutual benefits of their collaboration:

CT: I think bouncing ideas, that’s kind of my biggest thing is just being able to collaborate. Sometimes it helps to be able to talk orally or work something out to grasp what you want to do.

ST: And then encouraging one another. Cause maybe, like I said, if Mr. Wichert hadn’t said “Let’s do this” I wouldn’t have done it.

CT: If I wouldn’t have had a student teacher I probably wouldn’t have done it. So there’s like an accountability…I don’t like accountability necessarily, I like encouragement better because I want to encourage people rather than hold each other accountable. (Dyad 1 Exit Interview, 12-7-12)

Mikayla definitely viewed Mr. Wichert as the experienced teacher from whom she got to learn. She described their collaborative roles: ST followed CT lead, CT took lead and challenged ST to follow, ST then led in Storybird:

I would say I more followed his lead as far as integrating technology, because as I said, I wasn’t really prepared to do a lot of those things. So he decided to do Educreations, and as a result of that I learned that application. I had to set up a Twitter account. He’s really taken the lead on mostly all of it. But I think that
challenged me to do it as well. So I set up an Edmodo account for our classroom. One thing, I guess, that was kind of my lead through my professor was Storybird. I did that with one student and the other kids really wanted to do it as well, and we ended up doing the whole class being able to create Storybirds. (Mikayla, Exit Interview, 12-7-12)

Mikayla also commented upon the importance of receiving an iPad for the semester. “If I wouldn’t have had an iPad I wouldn’t have been able to do as much or have been as encouraged. I wouldn’t have felt comfortable to say, ‘Mr. Wichert may I borrow your iPad?’” (Mikayla, Exit Interview, 12-7-12). The CT is still clearly in control from this ST’s point of view, and out of respect she would not have asked to use Mr. Wichert’s iPad. Viewing herself as a technology newcomer, Mikayla also revealed that she never posted anything to the Edmodo site created for all Dyads to collaborate, but she did read everything that was posted. It took time for this ST to develop the confidence to lead in technological areas; she participated as a consumer.

In-person interaction provided additional collaboration. Mr. Wichert and Ms. Langston taught at the same school and described chance meetings in the hallway. Since they shared an iPad they sometimes discussed who would take it home at night as well as app ideas and teaching suggestions. These chance interactions provided accountability as one asked what the other was doing with the iPad.

Both CT and ST discussed the need for collaborating with a coach to integrate technology. Mikayla noted how the coach provided encouragement while supplying apps and ideas for using them in the classroom:

You were just really positive and encouraging. And even when we were taking
these seemingly small steps you just provided a lot of encouragement and positive feedback that helped me feel like, “Oh, I really can do this right. Even though I know this is really a baby step she is really encouraging me,” and that helped me a lot. Helped me not feel so technologically disabled. And then just bringing in, you would give us apps and encourage us to try them out. (Mikayla, Exit Interview, 12-7-12)

Mr. Wichert demonstrated willingness for complete immersion with support, “You’ve helped me a lot this semester, so thank you! Keep on bringing new ideas and I’ll keep on trying to implement them.” (Mr. Wichert, Exit Interview, 12-7-12)

**Teacher growth led to child empowerment.** Both CT and ST expressed growth as teachers integrating new literacies during this student teaching semester. Mr. Wichert experienced a paradigm shift on multiple levels while focusing on integration:

> It’s been great. I mean it’s kind of like when something clicks in your mind and you say, “I’m never going back to the old way.” It’s just kind of been like that. There’s your paradigm shift, if you will. It’s been nice to have one of those in education. (Mr. Wichert, Exit Interview, 12-7-12)

He went on to describe the benefit of working with a ST to integrate new literacies and the possibilities of what you can accomplish when you work together:

> It’s having two people in the classroom trying different things that really helps. I wonder what we will be doing by the end of the year, you know! Even if we don’t introduce any new sites or new anything, even by the end of the year just honing the craft of what we are doing now with what we’ve got.” (Dyad 1 Exit Interview,
Mr. Wichert went on to talk about how he experienced a paradigm shift when he began to view Edmodo from a student’s perspective rather than a teacher’s. This statement represents a jump in thinking about how students could grow as learners if they were the creators of products who posted their videos, responded to peer work, and shared their published writing with parents, school officials, and beyond.

I heard a child say, “I don’t know how to post to Edmodo,” and quickly a peer responded, “I can!” and helped the first student. Empowered children were troubleshooting problems for themselves and others (Observation 2, 11-19-12). They (children) were to all create and record their story, link their story on our Edmodo wall, and comment and reply on one another’s (stories). It took about a day or so to have them grasp all the details, but they are now doing it on their own during independent work time. They really enjoyed this! (Mr. Wichert, Log, 11-30-12)

One child said, “I wrote nine pages! I want to buy it!” Although children may simply publish online, Storybird offers the opportunity to publish for profit! This young entrepreneur articulated his pride in publishing an eBook by noting that he wanted to purchase it. A struggling writer, he completed more pages than the assignment required, which Mr. Wichert indicated was not usually the case. The motivational factor of online writing and publishing supported this child’s learning.

At the end of the study Mr. Wichert defined new literacies as self-directed learning that empowers children to be contributors and people of influence:

(New literacies is) learning how to access the information and understand it. Grab
it and just to utilize it almost, to see it as a utility really rather than information. But it’s also something where they (children) can be part of the creative process as well. And I think we’re just beginning to scratch the surface with that part of new literacies. (Mr. Wichert, Exit Interview, 12-7-12)

Both CT and ST described exciting goals for the next semester together and beyond. Mr. Wichert intended to put all the math videos on a YouTube channel that any teacher may access from a blog. His goal was to foster teacher collaboration through sharing. Eventually every teacher could create one lesson and together as a district you could cover all lessons. Mikayla also grew in her interest to integrate technology into her teaching. During the final weeks she stated her goal to get iPads in the classroom for her students. At first she thought she did not have time for this additional technology component in student teaching, but by the end she stated that it was a really good experience and she wished it could continue all year. Her philosophy was to master the new literacies you integrate this year, then add one or two new things each year:

Well I definitely was really encouraged by the use of iPads in the classroom, so I know when I am a first year teacher I am planning on writing a grant to try to secure iPads for use in the classroom...It would definitely be beneficial for fourth and above to secure iPads for everyone in the classroom. But a personal goal is after I get a teaching job, and if I get a grant, that I would like to purchase an iPad for my teaching use, kind of a classroom iPad...I would like to incorporate like the Educreations, the art things, just simple motivation things that you can do simply. (Mikayla, Exit Interview, 12-7-12)

Regarding new literacies, Mikayla advanced from not having heard of new
literacies to providing an operational definition and listing new skills and strategies students need today.

I think new literacies, that you are teaching kids how to utilize a technology, how to gather information from various sources using the Internet using applications, using technology to present information that they’ve learned so they can publish it or communicate it to other people, citing their sources. (Mikayla, Exit Interview, 12-7-12)

Mikayla also grew as she analyzed results of her SPED intervention using AudioNote to help a child work on fluency by listening to the ending sound that he added to words. Mikayla saw firsthand that use of the technology enabled this child to hear himself, realizing that he did not believe that he sounded like this. Mikayla grew as a teacher using technology when she saw the child learning in ways that would have been difficult without the iPad and audio app:

And then one intervention that I did that really was kind of eye opening for a student, you had suggested using an iPad to record a student’s voice while they were reading and then playing it back for them. And the student I did it with added the syllable “ah” to the end of a lot of words. And he knew that he did it. But when I recorded it and played it back he said, “That’s the iPad doing that.” He didn’t know that he sounded like that. He thought the IPad had changed his voice to sound like that. And I said, ”No, you do really sound like that.” Using it that way motivated him... I said do you think that maybe that’s the way you sound to other people? Do you think maybe Mr. Wichert can’t understand you sometimes? “No, Mr. Wichert can always understand me.” And then I had him listen to it (his
reading) and try to repeat back what he had just read and recorded, and he wasn’t
even able to decode a couple of the words that he had just read by listening to
himself. (Mikayla, Exit Interview, 12-7-12)

I conclude discussion of Dyad 1 with a quote from Mikayla summarizing her
growth in competence and confidence using technology because of the scaffolding
provided by Mr. Wichert and evidenced in the motivation she observed in the children
with whom she worked:

I would say I learned a lot from Mr. Wichert about integrating the technology.
That’s not something I would have felt very comfortable with at first, but I really
learned that there are a lot of simple ways that you can do it. And just seeing the
kids’ motivation and engagement I think that’s really encouraged me not to be as
afraid trying to do that when I’m teaching. (Mikayla, Exit Interview, 12-7-12)

Dyad 2 “Playful Integration”

Ms. Langston and Lauren were the respective CT and ST in Dyad 2 teaching third
grade at Bakewell, a Title I school. Several factors distinguished this dyad. Ms. Langston
taught for 25 years, making her the most experienced and oldest teacher in the study at
age 51. Her highest self-rating was a 4 in interest to use technology in teaching. She used
required technology but wanted to go beyond showing a YouTube video and making
PowerPoints to having students respond using technology, referencing her need to be
prepared for the new online reading series coming next year. Dyad 2 reported the least
professional development involving technology, Ms. Langston attending the Technology
Conference and Lauren reporting no professional development. Lauren, a Masters plus
certification ST, rated herself lowest of any participants in the study in ability to teach using technology, at 1 “novice” on a scale of 1 to 5. On my first coaching visit, Lauren broke into tears feeling overwhelmed taking sixteen credits in the Masters program and student teaching two days per week, coupled with the additional technology component, none of which she felt prepared to do:

(My goal is to learn) how to teach. Because all summer we just had pedagogical, you know, like the theory behind teaching, and now we’re supposed to be like teaching. But that’s the thing, we don’t use technology in any of our courses, I mean other than PowerPoint…(One professor) encouraged us to do Twitter so then I suggested it to Ms. Langston and (the para) and they literally laughed out loud at me, so I’m just like, OK… (Lauren, Beginning Interview, 10-10-12)

Ms. Langston believed children learn best through play and she used this philosophy as she structured learning activities integrating technology. I asked her to describe her philosophy of play:

Whenever we can give them the opportunity to play through the writing, play through their math, them experiencing it, not just sitting and listening, I don’t think they learn very well (that way). I just think kids learn through play…let them have conversations, let us talk about what we’re trying to do, and then letting their creative side come into play. That’s what I’m talking about playing through their writing. (Ms. Langston, Beginning Interview, 10-10-12)

On my first coaching visit Ms. Langston explained how she already enacted an idea she learned at the Technology Conference. “I did use that (Google Earth) for Social Studies. Oh, they (children) just thought that was the coolest thing. And then, of course
they went beyond Earth, they went to Mars! They were going to the different planets, because it goes all over” (Ms. Langston, Beginning Interview, 10-10-12). She demonstrated the Google Earth app then let students play and explore the depth and possible uses for this app. Additionally, she modified another idea she learned at the Technology Conference on Running Records Going Digital using PhotoBooth, a program with which her students were familiar, rather than the suggested AudioNote she did not remember.

Ms. Langston also followed this belief herself as she learned about the iPad and new apps, investing many hours into playing to learn. “Well, I’ll just play with it. It’s all about play, I know it’s about the play” (Ms. Langston, Beginning Interview, 10-10-12). It also evolved into the model Ms. Langston proposed for Lauren to explore apps for the classroom. Lauren played with the iPad in the back of the room searching for and sharing apps that complimented the lesson while Ms. Langston taught. This playful integration model formed the basis of new literacies integration for Dyad 2 (see overview in Figure 6).
Dyad 2 already used several district online programs weekly including: Lexia Reading, Symphony Math, BrainPop, Learn360, SpellingCity, DCA-Math Testing, and Pinnacle for grades and attendance (Ms. Langston, Log, 10-12-12). However, both CT and ST stated that they had never heard the term new literacies prior to the study. Interestingly, Ms. Langston had noticed a need for and was already teaching students a new literacies skill - active listening when using technology:

I’ve taught them so much about active listening, eyes on me, eyes on the speaker.

When you’re using technology, it’s different. You find my voice, but you look up
at the screen. And so teaching them to look up there where I’m using the laser or
the mouse or whatever, but find my voice, but don’t look at me, that’s difficult for
them at first. (Ms. Langston, Beginning Interview, 10-10-12)

Lauren began with a need to learn the actual technology even before trying to
teach with it. When she taught online programs using the laptop cart, Lauren shared
feelings of hesitation along with some success in connecting the technology:

I can turn the DocuShare (document camera) on, that’s a pretty big success for
me, but I still don’t know, like when Ms. Langston goes up there and she’s
switching over to things. I haven’t asked and I’m usually doing things back
here...Sometimes (I use the document camera) successfully, sometimes I think I
can’t do it! But I didn’t know you have to have at least one light on and have one
light off. I found the autofocus button today. So that was a good button. The
autofocus button, there’s a button to help you. (Lauren, Beginning Interview, 10-
10-12)

As this Dyad negotiated roles, Lauren’s lack of confidence in teaching with
technology propelled Ms. Langston into the new role of technology leader. Building upon
25 years of pedagogical content knowledge, Ms. Langston quickly integrated suggested
apps and websites into her teaching. Trying to encourage Lauren to build upon her stated
higher personal technology ability, Ms. Langston charged Lauren with exploring and
playing with apps that they could use in the classroom. The collaboration model Dyad 2
demonstrated mainly involved CT teaching whole class with ST supporting. In Weeks 5
and 6 Dyad 2 spiked their hours of technology use exclaiming: “I finally have an Apple
account. I am buying apps. I plan to purchase some kind of tablet” (Ms. Langston, Log,
One week later at 10:02 am Ms. Langston sent an email of celebration: “I have bought an iPad :-P” (Ms. Langston, email, 11-9-12). And Ms. Langston and Lauren continued to put forth effort to plan and teach using technology, Ms. Langston taking the lead modeling positive dispositions and practices for Lauren. For an overview of the time spent by CT and ST preparing to use technology and teaching with technology for each week see Figure 7.

**Dyad 2 Ms. Langston & Lauren**

![Dyad 2 Hours with Technology](image)

*Figure 7. Dyad 2 Hours with Technology. Hours spent planning and teaching with technology by CT and ST of Dyad 2.*

From then on Ms. Langston involved children in projects across the curriculum that used new literacies: asking questions, searching online to find answers, evaluating sites, collaborating, communicating learning with multimedia, and using technology. Each child had a laptop at his/her desk, arranged in pods for collaboration. Ms. Langston empowered children to choose technologies and troubleshoot to use them independently,
“You have been given lots of strategies. Sit down and give yourself a chance to try and problem solve the laptops” (Ms. Langston, Observation 4, 12-7-12). She negotiated with the preschool teacher to borrow six iPads daily when they did not use them. Combining these with her own iPad, her loaned university iPad, and Lauren’s loaned iPad allowed her third graders to learn with two children to one iPad. To thank the teacher for sharing iPads, she sent her third graders down to read digital books to the preschoolers, allowing the little ones to turn the pages. Observed lessons encompassed student-created projects in research-presented PowerPoints, Educreations math screencasts, and Puppet Pals reading videos. Posting and sharing student projects online at the classroom Edmodo site Ms. Langston created displayed another level of collaboration and publication for these young authors and their teachers. Additionally, Ms. Langston arranged with the principal for children to share their Puppet Pals videos with the whole school during the Monday Meeting in the gym. Arranging this assembly demonstrated huge growth in Ms. Langston’s confidence and competence using technology.

When teachers and students “play,” growth happens. Dyad 2 dedicated time to learn how to use the iPad and other technologies to teach, sometimes “playing” five hours per week to teach for ten hours using technology. Ms. Langston played with her iPad to explore apps that Lauren found as she played in the classroom while observing and supporting Ms. Langston. CT and ST began by ranking themselves lowest in their technology ability, questioning their decision to participate in the study:

It was like first week she (Lauren) cried and I was ready to cry. Second week, OK that’s exactly how our worlds have worked. I was like, “What did I commit to?” Every time I filled out those logs I was like “What did I get into?” (Ms. Langston,
Dyad 2 Exit Interview, 12-6-12)

Because of Lauren’s tearful reaction, Ms. Langston overcame her fears and led this Dyad in new literacies integration:

She (Lauren) knows how to interact with children, but interacting with children using technology…They (STs) will come in, they can Facebook, they can look up, they can Google, but they don’t know how to take it and teach with it.

Because those moments when that PDF reminder comes up, or the kids say ‘I can’t get to this,’ those little moments just freak them out. (Ms. Langston, Exit Interview, 12-6-12)

Lauren shared similar feelings of stretching professionally in her use of technology for teaching, and learning to let go and let children troubleshoot on their own. Lauren challenged the idea of modifying the authoritarian teaching model and adopting a facilitating role that empowers children. She explained what she thought teachers needed to teach children today to allow them to be successful, as well as the strategies she tried to develop as a facilitating teacher:

I think just basic troubleshooting. I have this moment of panic too. It’s just when something doesn’t go right, it’s hard because you don’t want them (children) to try and fix it necessarily; they might go a different place that they shouldn’t be. But not freak out when their spelling test doesn’t come up. Like, “OK how do you kind of solve this problem?” Or when the Adobe reminder comes on the screen, “OK just remind me later.” And have them deal with little curve balls that may come their way…Maybe just telling them when they raise their hand, “Well let’s just think about it. What do you think we should do?” I feel
a lot of times I just do it for them, it’s faster. Sometimes they just need to get a spelling test done. (Lauren, Exit Interview, 12-6-12)

Lauren talked about the way technology influenced children’s learning. Children learn best:

When it’s meaningful and they’re excited about it. So a lot of times technology brings that. And I do think their (Puppet Pals) plays when they knew they were going to be shown to the school, it made it a lot more meaningful and they worked a little harder than they would have if they would if it would never have been seen again...I think having them recording what they wanted to write. And then being able to hear that. Because that’s a big thing writing and how difficult that is to get, and seeing does this make sense, and where did I pause, and all those kinds of things. I think that was a really good thing for people to be able to hear that. (Lauren, Exit Interview, 12-6-12)

Lauren made a big paradigm shift from her goal of supporting students to empowering them to choose on their own. Ms. Langston modeled to help Lauren see how she helped children learn through play by letting go:

Exploration. Just letting them explore saying these are here. Because kids are already going, they are faster than me on almost everything already because technology is their little world. And they’re taking their Mom’s and Dad’s smartphones and playing with them. Using Grandma’s iPad playing with them. So the kids were going to apps that I don’t even know but they’re safely put on by (the district). And so just letting them have that. It used to be called plan, do, and review. Where they plan it, then they do it, then they review it. So it’s kind of like
with technology...let them have that moment of creativity. That place when kids can play, and I don’t mean like a video game, but when they can just experience, just say “Oh I don’t want to do that, I want to do it this way.” Then you always increase their learning. (Ms. Langston, Dyad 2 Exit Interview, 12-6-12)

Ms. Langston was an encourager who liked to see growth in her mentee. She said that the highlight of the semester was watching Lauren realize that she knew more than the amount for which she gave herself credit. By the end of the semester, Lauren was beginning to see the value of empowering students. She explained the student project she felt demonstrated the best way children used technology during the study, “Well I was just thinking about the dinosaur PowerPoint. They (children) got to choose their dinosaur, they got to choose pictures. The choosing of the pictures was the pinnacle of the project” (Lauren, Dyad 2 Exit Interview, 12-6-12). Lauren realized that allowing students to make choices motivated them to do more.

Other teachers in the school noticed growth in Ms. Langston as well. Mr. Wichert described the growth as he commented about the positive way she now used technology. “She has changed!...Like she would probably say she didn’t like it. She didn’t want it...And now she’s using it all the time!” (Mr. Wichert, Exit Interview, 12-7-12).

Collaboration benefits CT, ST, and students. Collaboration began with the CT and ST supported by a coach. Then the network of support expanded to include others as the Dyad set additional goals regarding technology integration. CT collaborated with many different people to learn how to set up accounts, share ideas, and allow her class to present their learning (see Figure 8).
Ms. Langston described the value of collaborating with a ST when integrating new literacies:

Oh my God, like a second teacher! It’s like co-teaching. Because students are at different levels so it’s the scaffolding thing that you are able to do with a co-teacher...If a student had struggled with oral directions she could slide up behind them because they keep popping up, you know how they have to pop up because they are so anxious, so they sit there and raise their hand...And then she could look up an app, and I could look up an app. Or if I missed a direction she could say “Oh, Ms. Langston they need to do this first.” Just those little things. Because it takes a lot of time to find all this stuff. (Ms. Langston, Dyad 2 Exit Interview, 12-7-12)
Lauren suggested that collaborating to integrate new literacies with her CT required her to examine apps more than she may have, and gave her someone to show them to, helping her learn to use them even better. “I probably wouldn’t have suggested the apps to Ms. Langston. I probably would have just come across them and kept them to myself. But I think I suggested them more often” (Lauren, Exit Interview, 12-7-12). Ms. Langston noted that the joint goal of new literacies integration affected their collaboration as a Dyad. “It gave us a bond. It gave us something to bond around. OK, is this difficult for you? And then it’s difficult for me too. So it gave us a talking point each week. We were both always learning” (Ms. Langston, Exit Interview, 12-7-12).

In addition to collaboration between CT and ST, both also noted the influence of a coach. Lauren noted that the weekly coaching meetings and online survey kept the goal of new literacies integration in the forefront and kept her thinking about that goal. Ms. Langston talked about the accountability and support the coach offered and how that motivated her to try things:

If you weren’t in my life I’m serious, that coaching piece that you did on the side made a big difference. All those iPad apps that I tried. I would have never gone ahead and bought an iPad...But I wouldn’t have taken that big step forward. Even though I’ve been itching to do it, I finally was able to do that. But the coaching that came from you was like that accountability piece. I am going to come to you for at least a half hour a week. Then log on and document what you are doing. So that accountability piece, you’re not just sending me an email saying try this app, try that app. You’re actually coming in and saying, “Now what do you need from me? Do you want to talk about the Cloud? Do you want to talk about Edmodo?”
So those things actually brought a little bit more clarity. (Ms. Langston, Exit Interview, 12-7-12)

Goals. Though the growth process of stretching can be painful, the results for Dyad 2 were rewarding. Lauren set a goal beyond the study to find five good online programs and five good apps that children can learn to use and then apply them in learning situations. She turned a negative feeling of “there are too many apps,” into a positive way of learning a manageable number of them and teaching them to children. Lauren knew how to teach using the district’s math, reading and spelling online programs and she found them to be great for integrating technology throughout the day. These goals demonstrate Lauren’s growth in confidence using technology to empower student learning.

Ms. Langston set a goal to incorporate meaningful new literacies integration into the lessons she plans. She suggested the need to develop a lesson-planning format incorporating the TPACK areas including technology used:

I want to think about how I actually incorporate it (technology) into my lesson planning. And not just writing down “do Lexia,” or “do Symphony Math.” Because I really do think about the apps, do they fit in with what I’m doing? Who needs to do that? So actually figuring it out like this week. So I thought about what you said. OK, so I have down the apps that I’m having them do, like Powerpoint. But there’s no place really built into my lesson plan that actually incorporates that and tells me how. I have to think, you have to do a lot of work for it. (Ms. Langston, Exit Interview, 12-6-12)

Overcoming challenges to grow in confidence and competence using technology
to teach, Ms. Langston described her thankfulness for the collaboration afforded by participating in the study:

When I talked to my peers in the building I feel like I have been so blessed to have this experience because I felt like I got more out of you as my coach, because now my (school) coach is split between two schools. But you actually made an appointment and said. “I’m going to be there.” You held me accountable: “I’m coming to talk to you, I want you to go online, I want you to tell me what you do.” (Ms. Langston, Dyad 2 Exit Interview, 12-6-12)

**Dyad 3 “Multiple Individual Exposures to Practice”**

Ms. Majeres, a “try it” CT, and Sarah, a “plan it” ST, taught second grade. Sarah reported lacking confidence in teaching, especially using technology. She respected her CT Ms. Majeres and structured her teaching after that of the more experienced teacher. Ms. Majeres reported just beginning to use technology to teach as well. Because of her perceived lack of available technology she used the loaned iPad to teach individual struggling readers in the back of the room while Sarah taught whole class. Ms. Majeres modeled teacher-directed individual child usage of the iPad for practice in reading, writing and spelling as a way to provide multiple exposures to content to help struggling readers. Sarah also planned teacher-directed uses for technology, guiding individual children to make sure they used apps properly. Although in transitional Week 7 Ms. Majeres allowed an individual child to create using the iPad (see Figure 9), it was really the teacher who transformed her use of technology over multiple exposures.
When I arrived for coaching the first day Ms. Majeres had already accomplished several of her goals responding to ideas she learned at the Technology Conference. She wrote a grant for an iPad 3 and also created a Google spreadsheet to help her second grade team monitor student progress. All teachers could view the scores with red indicating reteaching needed and blue demonstrating skill complete. Finally, she tweeted out learning goals daily to parents. Ms. Majeres noted that she had a larger goal to involve children in the writing and tweeting, however this goal was not realized:

I figured it (Twitter) out! Well, Sarah’s doing lots of the teaching so I’m sitting in the back figuring that stuff out. Every day I just write what their learning targets are for reading, writing, math and I either do like unit studies sometimes if there’s enough room, or vocabulary, or high frequency words for the week. And then I
just send it out there... But my goal was to eventually have them (children) do the
tweeting themselves and just send it out so that it was their learning, how they
could put it into small words. We just haven’t gotten that far yet. That’s fine. (Ms.
Majeres, Beginning Interview, 10-9-12)

This theme continued to play out throughout the study: CT grew in her use of
technology personally and professionally, however children used technology mainly for
practice rather than creating in SAMR transforming ways. ST followed CT’s technology
integration methods. One example of the way Dyad 3 integrated technology is how the
gifted reading group read a book on big cats and then Sarah took them to the computer
lab to research and learn more. After completing the research and writing a script, Ms.
Majeres used PhotoBooth to record each child giving their presentation, took screenshots
of their artwork, and then created an iMovie that she emailed to parents.

Ms. Majeres explained that Dyad 3 collaborated so one ran the technology while
the other taught. Ms. Majeres put the paper under the document camera and moved it
while Sarah read the math problem. While they mainly taught separately, Sarah expressed
interest in collaborating more with Ms. Majeres as the semester went on:

Just working together to come up with ideas. We haven’t set a specific week
where I’m going to start fading out with my teaching, but once we figure that out,
you know we might be able to work together to just, find ideas, or co-teach, or
something like that. (Sarah, Beginning Interview, 10-9-12)

While Sarah taught most classes, including two hours using technology, she
reported no time spent planning to teach with technology. Ms. Majeres dedicated three
hours to playing with apps on the Dyad’s newly loaned iPad while teaching one class for
an hour using technology. Investing time enabled Ms. Majeres to accomplish several of her goals already in Week 2 (see Figure 10). After she finished solo teaching, Sarah had time to play with the iPad and work with individual children; the student teaching cycle for this dyad was complete. CT modeling was so strong that when Sarah completed teaching whole class she looked to integrate technology the same way that Ms. Majeres did while Sarah taught. “I am done solo teaching, but will talk to Ms. Majeres about pulling students who could benefit from using the iPad/apps as a learning tool” (Sarah, Log, 11-30-12). While she taught whole class Sarah used the iPad as a teaching tool creating a graphic organizer herself with class input. Sarah could have had children retell learning to her using the graphic organizer but instead she just had them look at the organizer, not touch it. This example demonstrated Sarah’s need to continue to develop her pedagogy skills to engage children more fully with content and technology. Sarah’s teacher knowledge grew during the semester and at the end she described how she grouped children for research and for single iPad work, this time allowing small groups of children to make graphic organizers as an informal assessment. Sarah recorded the greatest amount of teaching using technology during Weeks 9 and 10, as she transferred ownership for creating to students.
I began to see the influence a CT has on an ST and the student teaching experience, determining the amount and type of teaching, technology integration, and collaboration. Sarah looked up to Ms. Majeres and followed her lead regarding technology integration. Even though she had experience using an iPad in child-centered ways at the university reading clinic, Sarah now followed Ms. Majeres’ lead using it more as a replacement for a practice worksheet. It is difficult for a ST to become assertive about her own instructional ideas within the CT’s model. In contrast to Dyad 2’s playful integration method for students, these teachers preferred to learn the technology themselves before they allowed students to use it. Perhaps both CT and ST’s emphasis on classroom management made letting students use technology seem too noisy or risky. Also, the one device model challenged both CT and ST. However when the technology project challenge needed to be met, Sarah went beyond to involve children in creating with technology, something her CT did not do.
To meet technology goals Dyad 3 expanded their collaboration network (see Figure 11). Ms. Majeres transferred her TPACK knowledge of suggested apps to the child’s para. Ms. Majeres also collaborated with her son to try apps before she used them at school. Both Ms. Majeres and Sarah expanded their technology integration with ideas from all members of the Dyad group at the workshop, and were affirmed when they shared their uses. Both reported loving to see what others were doing in their classrooms with technology. Following the conference both CT and ST reported increased time spent planning and teaching with technology.

*A gentle push can motivate reluctant teachers.* Dyad 3 began by asking me to hold them accountable to actually integrate new literacies during the semester. Without an outside push this Dyad noted that they probably would not use technology:

I think that what you did was kind of just push us to try something new, in a nice
way. Because you could say, “Here Ms. Majeres, here’s an iPad.” And I could say, “Thanks, I’ll play with that.” But when you were saying, “How are you using it?” I should probably find out a way to use it. This whole process has also pushed Sarah because she was very tech timid...And now it influenced her Capstone.” (Ms. Majeres, Exit Interview, 12-4-12)

CT and ST also pushed each other as they collaborated. Ms. Majeres said that she knew how to use technology personally but to know how to teach with it takes collaboration. They both talked about bouncing ideas, asking questions, having an extra person there for support, finding new apps or ideas to use, and discussing together to make you more self-reflective. “Having a student teacher allows you to do things where if it were just you it would be difficult. The para is not there all the time, she goes with Tom” (Ms. Majeres, Exit Interview, 12-4-12).

The other dyads also pushed each other. Ms. Majeres explained how the “Flipped Classroom” concept Mr. Wichert presented at the half-day workshop stayed with her and pushed her to try it when the opportunity presented itself. The success she experienced on multiple levels encouraged her to create more videos to help parents. In addition, the Word Work weekly technology plan used by Ms. Stout planted an idea to encourage Ms. Majeres to want to check out the laptop cart for the first time.

The principal and parents also provided a gentle push that encouraged Ms. Majeres through appreciation and recognition. After receiving two emails from parents about homework that was not understood one night, Ms. Majeres took 50 seconds to create an Educreations video demonstrating the math process and emailed it to the parents to use and reference. When the parents responded how helpful it was, their words...
inspired Ms. Majeres:

I made another one yesterday and I sent it out to parents and I had another parent respond with “thank you so much, this was really helpful.”…And one parent replied to mine (email) saying how helpful it was and that this gave her a glimpse into what math was looking like, and CC’d Dr. Adams (school principal). Then Dr. Adams sent that to all the staff. (Ms. Majeres, Exit Interview, 12-4-12)

The student teaching model influenced new literacies integration. In the semester-long student teaching model, Sarah was almost “solo teaching” when I gave Dyad 3 the iPad to use. She was planning and teaching whole class lessons daily, and Ms. Majeres left the room or sat relatively hidden in the back of the room working with individual students to provide the “solo” context for Sarah to become the teacher. As a result, Ms. Majeres had more time to look at the iPad and try out apps I showed them and use them with a few struggling readers, providing multiple individual exposures with scaffolding and interaction. She reported the apps as novel and motivating, “He doesn’t even realize he is practicing his handwriting” (Ms. Majeres, Exit Interview, 12-4-12).

Similarly, Sarah noted how busy she was at the start of the study, already into a pattern of planning lessons without the technology component. Both CT and ST stated that they felt new literacies integration needed to become a routine procedure, something they did every day, “Like if we had started the year tweeting the learning targets and hooking it up to the projector and every single morning we did it, then it’s something we would just do” (Ms. Majeres, Dyad 3 Exit Interview, 12-4-12). Sarah also noted the need to begin adding the technology component to lesson planning right away:

I feel like I didn’t really start, we didn’t use it right away in the semester, so I feel
if I would have started right away with it I would have included it, been able to include it more because I would feel more comfortable with it. I would have known that I have to take this (iPad) home, I have to take a certain amount of time every night to see what I can do with it. So just starting out right away...I think I feel like I was always so rushed to think about what I could do next and how I could incorporate that technology, otherwise I feel like I would have been asking more questions. But we kind of planned ahead in a lot of different things and I should have just looked at my plan book to see how I could have incorporated it more, even though we only have one (iPad) and we don’t have a ton of technology access here. (Sarah, Dyad 3 Exit Interview, 12-4-12)

Because of this student teaching model requiring solo teaching for several weeks in the semester, the best opportunities for collaborative teaching between CT and ST occurred when teaching responsibilities changed. Sarah integrated technology in student-centered ways as Ms. Majeres transitioned back into the lead teacher role and Sarah could support small groups or individuals. Although limited technology support was described in the initial weeks, for the majority of the study CT tried to leave ST alone to teach to build her confidence. To allow for more co-teaching, multiple student teaching approaches should perhaps be presented to CTs and STs as they plan how to collaborate. Sarah grew in her ability to use technology with students, explaining her troubleshooting process to involve multiple students on one iPad by the end of the semester:

I was only able to create three of them (graphic organizers), and I tried to add a new one and I was like, well this is not working. I just had them draw it out, and then the next day they put it into *Total Recall*, it was nice. I screenshotted it
(graphic organizer) and then emailed it to myself...and then we could create more.

You just push here and here and then it saves as a photo....I was glad because otherwise I would have had to just take a picture of the iPad with my camera. And that’s the nice thing you can’t even tell. It (the screenshot) doesn’t look like a picture, it looks like an actual thing. (Sarah, Exit Interview, 12-4-12)

While Sarah demonstrated her ability to plan and troubleshoot technology in student-centered ways, Ms. Majeres wrote a bold goal to try to accomplish before the end of the semester: “I am going to sign up to use one of the mobile labs! Yikes!” (Ms. Majeres, Log, 11-30-12). Although this goal did not happen during the study, she showed growth in wanting to try to check out a laptop cart now that she was teaching again.

The roles of CT and ST in Dyad 3 remained consistent; ST looked to CT as the leader. This innate authority of the role makes it important that CT remain open to ST ideas, and encourage technology integration in a variety of ways. In addition, the role of coach to encourage and provide support became an important third component in this learning relationship. In this triarchic model, both CT and ST learned from each other as they integrated technology with the support of a coach.

**Goals.** Both CT and ST reported wanting to get an iPad for teaching. ST wanted to prepare to use the new reading series with its digital components in a relatable way that is exciting for children. ST also wanted to use iPads for guided reading. CT added that children could use notations with the new reading series. Ideally she would like to have twelve children paired reading online on iPads, and the rest of the class up with the teacher in guided reading. Then, the two groups would switch so all children get both experiences. Ms. Majeres noted that she feels it is important for teachers to get children
ready for the 21st century:

I would say new literacies are something (I don’t know what that something is) that pushes a child to think 21st century. Because it can still be a book in a different format that pushes them to think, “Oh it’s too small I can make that text bigger, oh I can click on that word and it takes me straight to the dictionary and I can look up that word,” instead of what some of them do read over that word and never go back and figure out what it is. So it is something, and those are things that have only been available in the 21st century. (Ms. Majeres, Exit Interview, 12-4-12)

Dyad 4 “Switching Roles”

Ms. Stout and William taught second grade at Fenton Elementary, a school Ms. Stout described as low in technology because of student SES. “Fenton’s right in the middle, which is what we’re seeing as kind of a crunch. Because we don’t have Title I, but we also don’t just have money flowing out of everything from you know, PTO or whatever” (Ms. Stout, Beginning Interview, 10-10-12). Self-rated levels of proficiency with technology in teaching distinguished Dyad 4 as unique; ST William rated himself 4, higher than CT Ms. Stout’s 3 “adequate” self-rating on a scale of 1-5 with 5 “expert.” This dyad collaborated in a dynamic partnership that utilized each person’s strengths, with roles that switched throughout the semester. Ms. Stout recognized William’s technology ability and empowered him to teach her how to set up an iTunes account and locate apps to get started while she provided the pedagogy. She “used what he has. You know, have him help me because he knows way more than I do! He’s going to know the
Their collaboration for planning and teaching began immediately. Although Ms. Stout was more of a planner while William preferred to teach “on-the-spot,” together they negotiated lessons that furthered student learning:

I think we also need to sit down and look at... let’s start with one area first. And let’s plan, let’s look ahead. What are the objectives coming up? And then let’s think, ok, what can we use to teach that? Or, let’s look at an app that might reach that goal. Or maybe that area, that’s harder for him, or me. And then let’s go for it and make that spicier so it’s more interesting for them (children). (Ms. Stout, Beginning Interview, 10-10-12)

Each week both CT and ST noted the goal of further integrating technology across the curriculum, “I would like to introduce the use of more technology next week throughout several other subjects” (William, log, 10-12-12). Their purpose for including technology focused on increased student learning, “The main thing is I don’t want to use it as a bribe or as a ‘Oh, if you do good you can use this.’ I want to use it as, ‘This is how we integrate it all the time’” (Ms. Stout, Beginning Interview, 10-10-12). Both noted excitement in participating in the study coupled with a high desire to learn more about integrating technology into teaching:

I’m excited. I was just so excited when I found out we’re going to get to do this, and have an iPad in our class, and be able to use it and I just think that it’s going to be another piece to William and I getting to do some things that, you know, you don’t always get to do if you don’t have a student teacher in your room. I think that that’s going to be something fun and just a great learning experience. And it’s
going to help me with my personal goal and also for (our school technology
goals). (Ms. Stout, Beginning Interview, 10-10-12)

Using this dynamic collaboration model, this CT and ST changed roles regarding
new literacies integration. Although this switch began in Week 7, I observed
transformational teaching in Week 10 (see Figure 12):

I would actually say that to begin with I (William) was probably more the leader
where I was probably the one helping her (Ms. Stout), I would set everything up
and help her out. But then towards the end after she started really learning a little
bit more about it and getting interested in it then she started taking over, which
was really kind of neat to see. Because she was more my support than in the
beginning giving me ideas too. We just kind of switched places which I think is
kind of cool. So it was just kind of back and forth. (William, Ending Interview,
12-3-12)
Figure 12. Dyad 4 Timeline. Overview of highlights and developmental progressions across the semester. The Transitional Week arrow indicates SAMR-Redefinition of lessons to student-created and shared online.

Dyad 4 began team-teaching reading by encouraging students to ask questions about the story they read as a class. Ms. Stout responded to a student question about whether the story location was real or not by Googling the location of the lake using the one loaned iPad. William used the teacher laptop to provide additional background knowledge through visuals, effective collaboration:

In reading students were reading a story that talked about Big Bear Lake, which is located in California. Using the computer I looked up pictures of Big Bear Lake for students to see what it looked like in real life. (William, Log, 10-12-12)

As the semester progressed, learning through collaboration coupled with time spent planning and teaching with technology allowed Ms. Stout to take over the lead technology role. Ms. Stout began reporting an hour of planning time for two hours of teaching using technology with increasing numbers as the study progressed, while
William recorded zero hours devoted to planning or teaching with technology and ceased reporting following Week 4 (see Figure 13).

![Dyad 4 Ms. Stout & William](image)

*Figure 13. Dyad 4 Hours With Technology. Hours spent planning and teaching with technology by CT and ST of Dyad 4.*

Ms. Stout developed the most contacts in her professional technology network. She sought out and utilized technology professional development on many levels, greatly expanding her collaborative network (see Figure 14). She located the Simple K12 Teacher Learning Community online site ([http://community.simplek12.com](http://community.simplek12.com)), joined, and attended her first webinar. She demonstrated use of the resources I posted and then shared her own resources with all dyads at Edmodo, as well as initiating the Guam global project. She purchased an iPad and began to troubleshoot with Apple, Epson, and Best Buy to project remotely. Ms. Stout also reported using many new apps, websites, and technologies each week (Ms. Stout, Log, 11-16-12).
Switching Roles can be beneficial on many levels. Switching Roles became one effective model of ST/CT collaboration when integrating new literacies. This Dyad switched roles on many levels throughout the study as participants moved from: consumer to creator, teacher to coach, unconnected to connected, dyad hierarchy to dyad team, conference attendee to conference presenter, using the iPad as teaching tool to iPad as learning tool, local to global, single-use apps to multiple-use apps, enhancing lessons to transforming lessons, calling for help to troubleshooting. As Ms. Stout and William processed the highlights of the semester they shared thoughts about how William’s technology knowledge guided Ms. Stout, and her pedagogical content knowledge informed their TPACK lessons:

I learned a lot from William because this comes pretty natural to him, and me not so much. Because I hadn’t even held the iPad in my hand until I went to the
Technology Conference, so he showed me...So, just kind of teaching me those little baby steps as to how an iPad works. And then it’s been fun to bounce ideas off of each other. And think about, “Hey how could we use this? Or we could use this during this time of the day. Or this might be good with this kid.” So just kind of bouncing ideas off and getting ideas from each other has been really beneficial to me as a teacher. (Ms. Stout, Dyad 4 Exit Interview, 12-3-12)

And I agree with Ms. Stout in the fact that I think the bouncing ideas off. Because again there was a lot of things that she mentioned to me where we could integrate technology where I was like, “Wow I never thought of that!” Or with the Guam thing, she was the one who said “Yeah, we could Skype them!” And I was like, “Yeah, that would be really cool.” And it’s kind of cool because I’ve like done a lot with Skype so I helped her set up her Skype account and stuff but again, just because I kind of knew a little bit more of it. But she’s already becoming a pro at technology! So just bouncing ideas back and forth...I think the highlights would be really when we started working this technology, and just seeing as we both learned new things to see how excited we both were getting. But not only that, to see how excited the kids were getting about it, too. (William, Dyad 4 Exit Interview, 12-3-12)

William discussed the dynamic nature of their roles as ST and CT throughout the semester. Each assumed leadership roles in different areas for different purposes at different times. This reflects Don Leu’s (2002) comment about each of us knowing something but none of us knowing all the technologies. At times William suggested ideas for effective technology integration into Ms. Stout’s planned lessons. At other times Ms.
Stout led the way in learning how to use the iPad more effectively with children in this collaborative model:

For Ms. Stout, I would say she took more of a leadership role in the fact that she really took the initiative to write down what the technology assessments were so we knew what we had to test the second grade students off of. And then she started brainstorming some ideas. I think I was kind of that support for her so I could kind of help her. She said, “I would like some feedback, maybe some ideas of what we could do to hit this assessment.” I think for her she really took off with the whole thing, technology is great. And she even gave me some ideas, so it was great I think. And for me I think I was there to help support, and she had questions when she first got her iPad and I was able to answer them for her, help her out. I think that correlation between the two of us we could just kind of work together and help each other out. I would actually say that to begin with I was probably more the leader where I was probably the one helping her, I would set everything up and help her out. But then towards the end after she started really learning a little bit more about it and getting interested in it then she started taking over, which was really kind of neat to see. Because she was more my support than in the beginning giving me ideas too. We just kind of switched places which I think is kind of cool. So it was just kind of back and forth (William, Exit Interview, 12-3-12).

In the end, both described the study experience as benefitting them. William described the technology component as the best part of student teaching. Ms. Stout explained how it changed the way she looks at every lesson through the TPACK
At the beginning I was still learning and not so sure of myself. And once I realized that this was like a gateway to so many different opportunities, I decided to get upon myself to learn as much as I could in the time I have with him (William), and with the iPad and things. And it just took me to another level. I decided I needed to get one too, so I went and got my own. You know every night I’m working a little bit of time to learn a new app or to figure out what would be better for writing, or what would work for reading, or what would be an engaging app to use when we have the kids being able to work independently. So continually connecting it to the curriculum by quarter, connecting what I’ve learned in this class to what I need to do in my teaching because now I’m the technology teacher. So it’s a big responsibility and I want to make sure that I have my bearings and I have a plan or idea of how to teach those objectives... I think it has just been very beneficial to me in my professional growth. Kind of changing the way I look at things. You know I constantly catch myself now going I could do this... Its’ just a different frame of mind. Like I said earlier, a paradigm shift. You have to think, OK I was here, but now I could be here, and I could do it this way, or I could try integrating some of these different strategies or these different pieces of technology to gain their engagement or get them excited or interested in what I’m teaching. (Ms. Stout, Exit Interview, 12-3-12)

**Empowered teachers empower students.** The more effort this CT and ST devoted to integrating technology into teaching and learning, the more comfortable they felt empowering students to become creators as well. With iPads, that turnaround time...
took less than ten weeks from first touching the device themselves to teaching its uses to children. Ms. Stout taught using technology for many reasons to: “make her kids famous” by enlarging their audience, prepare children for lives in the 21st Century, remain relevant as a teacher, engage students in learning, connect globally with other teachers and second graders, grow professionally, and meet standards. As she integrated technology she was validated on many fronts which encouraged her to continue: engaged students learning at high levels (Guskey, 1986), impressed parents thanking her for sending electronic books and recordings of their children, other teachers coming to her for technology assistance and sharing apps, opportunities to present from the university, support from the coach, and appreciation from the principal for writing a grant for iPads. These successes empowered this CT and reinforced the time she devoted to planning and teaching with technology.

Ms. Stout gave examples of how students wanted to take charge and write eBooks themselves on the iPad saying, “I want to show you (what I can do on the iPad).” Ms. Stout commented that when this girl with behavior issues used *eBook Magic* to write by herself she “took more ownership in it than if I (Ms. Stout) was doing it all.” The student clearly articulated the process needed: “I need to go back to Notes, I need to double click, etc.” (Ms. Stout, Coaching Notes, 12-3-12). This child knew the terminology and process which helped Ms. Stout understand that children were capable and able to create using technology.

She also noted that working with a coach to guide her was important, “And I think you just have to be open minded and collaborating is huge. And working with you (coach) has been great. Having you come in and kind of troubleshoot with us, and giving
us ideas has been the best” (Ms. Stout, Exit Interview, 12-3-12).

Both CT and ST described children learning best when they were engaged and active. William described children’s best use of new literacies over the semester as when the children took control of creating their own eBook and working technologies themselves:

I think students learn best when they are actually engaged, when they have kind of a say in what they are learning, control their learning. I mean especially too when they can teach each other. What we’ve had them do is after they created their storybook, they wrote the story, they created their own storybook, they got to do everything, they got to pick the pictures that they wanted for everything, then we had then share it. Just that power. I think that’s the way they learn best is through that engagement if they have a say in there, they’re learning. We kind of set the pace for them and what they need to learn, but letting them take over a little bit gives them that motivation to do well and be successful. I definitely like the fact that we had them use eBook Magic and create their own books because it also taught them how to handle the technology and they learned how to use it. (William, Exit Interview, 12-3-12)

William also shared the example of how they scaffolded children using TumbleBooks in stations during Reading. They empowered children by breaking processes down into individual steps, assisting at first, then through a gradual release of responsibility giving more ownership to the child:

So even with TumbleBooks when we first started with TumbleBooks, we had to have everything set up for them. We had the laptops set up, they would bring it
over and we had to enter the password; and normally we still enter the password because they don’t know it. But after we do that now they just bring the laptop over and we enter in the password, but then they would be able to choose their own books, they know how to do it, they know to get the headphones, they know where to plug it in, they knew how to do it. That was one of the highlights. One of my goals was to get them involved, get them active using technology...They just start kind of taking that initiative then. (William, Exit Interview, 12-3-12)

Ms. Stout received positive feedback from children and parents with increased technology integration. She reported that parents loved receiving their child’s eBook Magic stories via email. Ms. Stout reported increased student engagement when creating eBooks and going beyond with their learning through the Guam project. “(Children are) creating their published eBooks - some really love taking over this (process) and doing it without help! Kids are also bringing in extra information on Guam and returning their flat people with a handwritten letter that we are going to mail to Guam” (Ms. Stout, Log, 11-16-12).

Goals. Both CT and ST set technology integration goals to accomplish following the study. Ms. Stout just received the right projection cord on the final day of the study so she wanted to project more during teaching. All of her troubleshooting paid off! She wanted to be able to project children’s eBooks to “make them famous” as she promises. She noted the desire to continue Tech Tuesdays for Word Work in the computer lab, and encourage her fellow second grade teachers to continue the digital component in Word Work as well. Ms. Stout set a goal to integrate Educreations with math as she discussed during an observation, as well as collaborate with Guam using technology.
William continued with his original goal to integrate technology throughout the day. He expressed that it was now quite easy for him to integrate technology in writing and whole group reading because he had many opportunities to do that in student teaching. He listed math and integrated studies as areas where he had not yet integrated technology but would like to. William also set a goal to try to “Flip the Classroom” by creating Educreations videos, an idea modeled for him at the conference and workshop.

**Dyad 5 “Confluent Integration”**

Ms. Lisko and Angeline were the respective CT and ST in Dyad 5. Both educators rated themselves as competent using technology to teach and highly interested in learning more about integrating technology into teaching on the Technology Rating survey. Several factors distinguished this dyad. Angeline was the only participant to present at the initial Technology Conference, presenting *Writing and Reporting using eBook Magic*: her CT Ms. Lisko attended her presentation. In their kindergarten class, this dyad taught the youngest group of children in the study. CT and ST initially reported working mainly individually, until they needed to do a whole class technology project required in the study. At this point all components flowed together to meet this additional shared responsibility: their collaboration network expanded, their dyad teaching style changed, and they learned to check out the laptop cart (see overview in Figure 15). As Ms. Lisko stated, “(The) key (to new literacies integration) was just participating in the study group, I was like ‘Oh well, I have to do something.’ You know you’re not going to change unless you are almost forced to” (Ms. Lisko, Exit Interview, 12-3-12).
As the study began, Angeline was planning and teaching most lessons. Ms. Lisko on the other hand was not teaching many classes so she reported taking time to plan to use technology. As CT took over teaching at the time of the children’s technology project, CT planning and teaching reported times increased. After transitioning from the whole class teaching role, Angeline reported more time planning to use technology. For an overview of the time spent by CT and ST preparing to use technology and teaching with technology see Figure 16.
Week 6 became a planning week for Dyad 5 preparing for their whole class technology project in Week 7. They reported four main firsts in Week 6: (a) checking out and bringing the laptop cart into the classroom, (b) expanding their collaborative network, (c) locating apps themselves and sharing them with me during the coaching session, and (d) involving children more actively in technology integration. Ms. Lisko initially contacted the Computer teacher to plan this project, but the response was that kindergarteners are too young to do this. “The Computer teacher was pessimistic so I went to the Media Specialist” (Ms. Lisko, Coaching Notes, 11-14-12). “I don’t think they’re too young to learn it” (Ms. Lisko, End Interview, 12-3-12). This persistence empowered Ms. Lisko to accomplish her goal. Working with the Media Specialist, Dyad 5 planned to have children use Google tools to create an -at family presentation. Together this determined trio tried to anticipate what issues kindergarteners may have logging in, searching and evaluating Google Images, cutting and pasting, opening multiple windows,
and typing since this would all be new for them. Ms. Lisko and Angeline decided that each would work separately with children who were having difficulty to assure that all would be successful.

When the dyad encountered a challenge that necessitated brainstorming and troubleshooting, the level of collaboration with each other and their network increased. In a paradigm shift of Confluent Integration children became creators using new literacies. Ms. Lisko collaborated with the third grade teacher to arrange a time when the laptop cart could be checked out during kindergarten guided reading that did not conflict with testing use. The third grade teacher taught Ms. Lisko about jump codes and showed her how a teacher can create a jump code for any website using a letter and number pattern. Providing additional benefit, this URL shortener also helps children review their letters and numbers.

Even though both CT and ST could plan lessons individually, when the task was new they planned together. The addition of a technology component did increase collaboration in planning and teaching. CT definitely took the lead with this project in modeling and teaching whole class; ST supported CT and children with technology. The full collaboration team (see Figure 17) transformed learning using technology to create a new student product that was never attempted before in this classroom (SAMR-Redefinition). Kindergarteners created a multimedia presentation and emailed it to parents, learning many new literacies skills and strategies in addition to the Word Work - *at* family content. CT and ST collaborated to present TPACK lessons, integrating Technology Knowledge into their Pedagogical Content Knowledge, with students benefiting from this targeted approach. Because of required content and technology
standards, even when content learning remains even but technology is added to a lesson, it benefits children because they learn how to use 21st century skills in addition to the subject matter.

Figure 17. Dyad 5 Collaboration Sociogram.

**Having technology requirements for the study increased the dyad’s technology integration in student-centered ways.** The requirement to involve children in a technology project and assess the projects for six children motivated Ms. Lisko and Angeline to try the Google Presentation project with their kindergarteners. Angeline stated that their best technology use with students was the -at word family project because the students were actually using the computers. “The only thing I ever did with the iPad for the assessment (rubric) was the six kids (-at family projects)” (Angeline, Exit Interview, 12-3-12). She also noted that the greatest collaboration happened mostly with
the -at family project as she and Ms. Lisko bounced ideas off of each other. “I think just being there for her for support probably helped a lot too I’m hoping... I know she has more experience with Kindergarteners so it was really great to see how she used it as a veteran in a classroom. Because I would have never guessed of using Google Docs for Kindergarteners. It definitely gives me faith that even if they are young like kindergarteners they can use Google docs” (Angeline, Exit Interview, 12-3-12).

In the end both CT and ST stated that the Google Presentations were the highlight of the semester, aligning with greatest collaboration, student use of technology, and TPACK teaching. Ms. Lisko shared similar responses, “Well I think there was more emphasis on trying to integrate it (technology) into what we were doing. I had never even used the mobile lab before. And because of this I was, well let’s see what we can do. And I learned about jump codes, and all of that and I wouldn’t have known any of that” (Ms. Lisko, Exit Interview, 12-3-12). Ms. Lisko also added that she would have integrated technology even if she did not have a ST, but probably not without a coach. Support is critical.

Accountability motivates. The workshop required dyads to share their best uses of technology with children so far. This spurred Ms. Lisko to locate a new website and create a graphic organizer to involve students. They had not mentioned using the TenMarks website or Popplet Lite graphic organizer in coaching sessions or weekly online logs before the workshop, so I was excited to learn about the additional technology integration and to see coaching professional development enacted and shared. I believe the requirement to present motivated them to do more than they may have otherwise done, with children benefitting. They also had to collaborate to decide what technology
each would present; up until now little collaboration had been reported.

Ms. Lisko explained how she used the *Popplet Lite* graphic organizer she showed at the workshop. First, she read a story two times to children to work on sequencing. Children initially responded to questions from memory without visual cues. Then, Ms. Lisko used a camera to take pictures of three events in the book, placing these visuals into the *Popplets* to allow students to manipulate the pictures to place them in correct chronological order. Ms. Lisko also demonstrated use of multiple technologies in a single project when she filmed math videos of children telling math stories to meet the Math Talk requirement of the new curriculum. When she tried to post them on BlogSpot without success, Ms. Lisko noted she might switch to Edmodo, a networking site presented at the workshop and demonstrated more thoroughly in coaching, to share projects. This teacher now had a larger digital repertoire to inform instruction.

**Student teaching requirements and CT lead determined dyad collaboration.**

From the CT point of view, collaboration was two way and effective. Ms. Lisko was a “do it” experienced teacher who did not need to plan much:

> We worked very well together. Angeline did a fantastic job all the way around. We just bounced ideas off of each other and we had discussions about what we were doing. And asked advice from each other from what our knowledge base was. So she had had more experience with the iPad than I had and found some stuff that we could use. We just bounced ideas off of each other. She was like, “Oh what if I tried this, do you think that could this work?” Also I could organize all the resources in order to show it all do we have all the right dongles, and all of that stuff. (Ms. Lisko, Exit Interview, 12-3-12)
Angeline described how their dyad collaboration pattern evolved. The student teaching semester helped her feel more empowered as a teacher when Ms. Lisko was not...
in the classroom, but that also made her question herself when Ms. Lisko was present: Usually when she (Ms. Lisko) was teaching I just supplemented it. When I was teaching she was out of the classroom a lot to finish projects that she needed to have done. Or she would work on other items. Because pretty much when I was teaching the lesson I was, it was me and the paras in the classroom. She was there quite often but I didn’t really have her help the way that I helped her when she was teaching the lessons. I think that’s the way it evolved because we found out that I was a lot more relaxed if she wasn’t in the classroom. Because I was subbing for her for like 2 days in a row and one of the other teachers said “more relaxed and more confident with students when Ms. Lisko wasn’t around.” Now that she said that I think it was just me getting nervous because I kept second guessing myself when Ms. Lisko was around. So I think Ms. Lisko would leave the room to help ease the student teaching response. Because she had confidence in me to teach the curriculum which was really good experience for me because I felt like I was actually the teacher instead of just being there like I did in my practicum. I didn’t really feel like a teacher, I felt like I was just there. So I got a little more confident in myself as a teacher and with classroom management I was definitely more assertive and not second guessing my decisions with discipline. So I don’t think it was designed like that at all I think it just evolved like that. (Angeline, Exit Interview, 12-3-12)

**Next steps.** At the end of the study, Angeline described new literacies from a student-centered viewpoint where these tools empower students to learn on their own: (New literacies is) integrating technology into a lesson that students can use to
learn more about a particular subject they want to. So basically, it’s using technology to help students become lifelong learners. Because basically they can use the iPad to learn by themselves and they can use the computer to learn by themselves, but giving them the tools to understand what will help them learn. Like figuring out how to use Google Search for research. Or even using Google Docs for a PowerPoint presentation. Helping them learn how to use those different devices that are out there so they can use those devices and apply it to their learning. (Angeline, Exit Interview, 12-3-12)

Based upon her definition of new literacies, Angeline set a goal: “I would like to use technology to supplement the curriculum...And use it in a way that my students can become independent in using the item that I’m teaching them” (Angeline, Exit Interview, 12-3-12).

At the end of the study Ms. Lisko defined new literacies as Integrating technology into what you are already doing. So you are just starting in the beginning in kindergarten where you are teaching them the basics. Just like with anything else you are teaching them letters, well you have to teach them how to log into a website” (Ms. Lisko, Exit Interview, 12-3-12).

She set goals to develop these new literacies in kindergarteners based upon her belief that children learn by doing. Not only does she intend to use the mobile laptop cart once a week, but she also plans to encourage the whole kindergarten team to use it once a week for Word Work, an idea I shared with her that another dyad implemented. The collaboration network provided many sources for ideas, just as this dyad discussed appreciating Google Docs to support collaboration between their team members.
CHAPTER 5: DISCUSSION

This study examined student teacher/cooperating teacher dyads (ST/CT) collaborating with a coach to integrate new literacies in elementary classrooms. I wanted to understand how ST/CT dyads work together when given an additional task of integrating new literacies during student teaching and supported by a coach. How would these dyads integrate content, pedagogy, and technology in their teaching and student learning? Overall I questioned: How is collaboration in new literacies integration enacted between a ST/CT dyad in an elementary classroom when assisted by a coach? In addition I asked: (a) How do ST/CT dyads enact learning gained during professional development in the classroom? (b) How do ST/CT dyads have children use new literacies for learning? and (c) Does an emphasis on technology integration change the collaborative nature of dyads? If so, how do CTs respond? How do STs respond? By triangulating data, themes emerged that inform teacher preparation and professional development for the 21st century. Results revealed effective approaches for new literacies integration that empower ST, CT, and children.

The Technological Pedagogical Content Knowledge (TPACK) framework (Mishra & Koehler, 2006) provided the foundation upon which I constructed this study. CTs and STs with varying degrees of teacher knowledge in technology, pedagogy, and content created TPACK lessons as they combined their areas of expertise. In addition, I incorporated the Collaborative Inquiry model (Ball & Cohen, 1999; Palmisano, 2013) to inform the analysis of collaboration of new literacies integration by ST/CT dyads. As the study unfolded I observed dyads form collaborative networks to support their new literacies integration goals demonstrating the power of Collaborative Inquiry in shaping
TPACK lessons. As I examined the rich collaborative sociograms representing these dyads more closely, it became clear that a triad in the center informed the network surrounding it. CT, ST, and Coach formed a triangle with established lines of collaboration via coaching meetings, email, logs, observations, interviews, and conferences. Through a process of dynamic tension, ST, CT, and Coach each brought different areas of teacher knowledge to the collaborative process through cyclical planning, acting, and reflecting together to create student learning at the center of TPACK. Based upon these findings I propose the Triarchic Model of Teacher Preparation (see Figure 18) as a model for 21st century student teaching emerging from this current line of research (Trainin & Friedrich, 2014). I will discuss results of this study using the Triarchic Model. Several unique collaborative approaches for integration emerged which produced TPACK lessons by combining ST/CT teacher knowledge through a cyclical process of planning, acting, and reflecting. ST/CT dyads produced qualitative evidence of this process that I discuss throughout the chapter.
Figure 18. The Triarchic Model of Teacher Preparation. Creating TPACK via dynamic tension through Collaborative Inquiry in the student teaching field placement setting. Adapted from TPACK (Mishra & Koehler, 2006, http://tpack.org)

My qualitative research questions and findings followed the Triarchic Model framework. After deeply examining the data, patterns of collaboration for new literacies integration arose through three qualitative themes: (a) Collaborative Approaches to Integration that Work, (b) Teacher and Student Growth with Empowerment, and (c) STs and CTs both become Learners through a Technology Integration Focus. These themes explained the methods and outcomes of new literacies integration among the five ST/CT dyads and provided support for new directions in teacher preparation via the Triarchic Model.

Although CTs and STs varied in teaching and technology experience, age, gender, school situation, grade, and earned degree, all grew in new literacies integration during this study. Each unique dyad used collaboration methods that utilized the abilities of that CT and ST. Regarding the TPACK areas of teacher knowledge, each undergraduate ST
brought technology knowledge to the study from personal use and their university reading clinic experience. One graduate ST used technology personally but never in teaching while the other graduate ST seldom used technology personally or for teaching. Regarding pedagogy knowledge, graduate STs taught for the first time during this study while undergraduate STs brought limited practicum teaching experience to the study.

CTs all taught for six or more years, and four of the five earned masters degrees. These CTs demonstrated high levels of pedagogical content knowledge, however they were all still learning how to effectively integrate new literacies into their practice. This interesting mix of CTs and STs, pre-paired as dyads for this student teaching experience prior to enlisting in the study, found ways to combine their strengths to prepare TPACK lessons for children.

The ensuing discussion focuses on the commonalities that emerged regarding collaboration in new literacies integration as enacted by ST/CT dyads in elementary classrooms when assisted by a coach. I will consider the patterns of collaboration and associated themes that fostered implementation of new literacies integration to inform research questions: (a) Collaborative Approaches to Integration that Work (How do ST/CT dyads enact learning gained during professional development in the classroom?), (b) Teacher and Student Growth with Empowerment (How do ST/CT dyads have children use new literacies for learning?) and (c) STs and CTs Both Become Learners when Technology Integration is an Added Focus (Does an emphasis on technology integration change the collaborative nature of dyads? If so, how do cooperating teachers respond? How do student teachers respond?).
Collaborative Approaches to Integration that Work

New standards for professional development call for more collaborative efforts in schools, along with expanded use of technology and the Internet (Fertig & Garland, 2012). As people regularly connect globally through ICTs and communicate with an ever growing network of people (Bereiter and Scardamalia, 2012), teachers and students need to be able to collaborate. CT/ST dyads utilized a variety of collaborative approaches to integrate new literacies in this study, adding to the literature. Below, I discuss the first research question: How do ST/CT dyads enact learning gained during professional development in the classroom?

When the task got harder, collaboration and effort increased. The data from this research support the notion that, when teachers collaborate, they are more likely to invest time and effort into preparing and teaching using new literacies skills learned in professional development. Weekly logs collected data recounting with whom and how each participant collaborated. Coding showed instances of patterns of collaboration recorded across dyads: collaboration-general (72), collaboration-dyad (115), collaboration-school team (87), collaboration-planning (57), collaboration-coach (53), collaboration-none (21). In addition, dyads recorded 38 instances of the collaborative term “bouncing ideas” as a way of planning and learning from each other. CTs talked about valuing learning from STs:

So she’s going to learn some good apps to use or different ways of, you know. Or what she’s learning in her classroom, how to bring that in here, and anytime you can get those good, new ideas. Because often, they’re not another thing to do, it’s, you’re doing something more efficiently or you’re kind of helping the kid in a
different way than you have before. (Mr. Wichert, Beginning Interview, 10-11-12)

STs valued input from more experienced CTs as they planned and reflected together:

Be there for each other to bounce ideas off each other and then like you know she’s the more veteran teacher so it’s nice to be able to bounce my idea off of her and say, “Would this work or not?” and a lot of times she goes “It would work, but maybe just tweak it here or there.” So it’s nice that I have somebody there that I can talk to and know if it would be a good idea or a bad idea, and if it’s a bad idea how we can make it better. (Angeline, Beginning Interview, 10-3-12)

When dyads wanted to try something they saw at the conference or workshop but it was more difficult than the CT or ST felt they could accomplish alone, they frequently reported collaborating to figure it out and devise a plan. Additionally, I requested that each dyad lead children in creating a technology project. This expectation challenged all dyads and represented a time for increased planning, teaching, and collaborating.

Examining the data, I noticed that the transitional week for dyads when they transformed their teaching to make children creators began in Weeks 6 and 7, with Dyad 4 celebrating a huge paradigm shift in Week 10 (see table 11). All CTs reported increased time spent teaching and planning during this transitional week. All dyads also noted the importance of the half-day workshop in Week 5, for increasing their collaboration to include other participants in the study and introducing them to classroom-tested new literacies ideas that spurred them during the subsequent weeks.
Table 11

*Transitional Week Data by Dyad: Comparing Teaching, Planning, and Classes using Technology during Transitional Week with Average throughout Study*

<table>
<thead>
<tr>
<th>Dyad</th>
<th>Transitional Week</th>
<th>SAMR Level</th>
<th>Hours Teaching/Average</th>
<th>Hours Planning/Average</th>
<th>Number of Classes/Average</th>
<th>Number of Collaboration Partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7</td>
<td>Redefinition</td>
<td>CT 5/3.4</td>
<td>ST 1/.5</td>
<td>CT 13/10.7</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CT 2/1.7</td>
<td>ST 2/.8</td>
<td>ST 1/.8</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>Modification</td>
<td>CT 7/6.3</td>
<td>ST 0/1.4</td>
<td>CT 10/10.8</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CT 3/3</td>
<td>ST 0/.9</td>
<td>ST 1/2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>7</td>
<td>Augmentation</td>
<td>CT 1/.7</td>
<td>ST 3/2</td>
<td>CT 3/1.1</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CT 2/1.9</td>
<td>ST 1/.7</td>
<td>ST 5/3.4</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>Redefinition</td>
<td>CT 9/4.5</td>
<td>ST NR/.3</td>
<td>CT 14/9.8</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CT 3/1.3</td>
<td>ST NR/.3</td>
<td>ST NR/1.3</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>7</td>
<td>Redefinition</td>
<td>CT 2/3</td>
<td>ST NR/.8</td>
<td>CT 4/9</td>
<td>9</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>CT 2/3</td>
<td>ST NR/.2</td>
<td>ST NR/.7</td>
<td></td>
</tr>
</tbody>
</table>

Usually dyads collaborated with their dyad partner, but they also expanded their collaboration network during transitional times. Dyad 4 created the largest collaboration network including global collaboration with Guam, professional collaboration with Apple, Epson, and Best Buy, local collaboration with multiple teachers and administrators in the school, online collaboration for professional development and sharing resources with the other Dyads, and beyond as needed. Dyad 4 discussed their collaborative process in the following conversation that is representative of those in other dyads except around different professional needs:

So, (my ST was) just kind of teaching me those little baby steps as to how an iPad works. And then it’s been fun to bounce ideas off of each other. And think about,
“Hey how could we use this? Or we could use this during this time of the day. Or this might be good with this kid.” So just kind of bouncing ideas off and getting ideas from each other has been really beneficial to me as a teacher. (Ms. Stout, Dyad 4 Exit Interview, 12-3-12)

And I agree with Ms. Stout in the fact that I think the bouncing ideas off. Because again there was a lot of things that she mentioned to me where we could integrate technology where I was like, “Wow I never thought of that!” Or with the Guam thing, she was the one who said “Yeah, we could Skype them!” And I was like, “Yeah, that would be really cool.” And it’s kind of cool because I’ve like done a lot with Skype so I helped her set up her Skype account and stuff but again, just because I kind of knew a little bit more of it. But she’s already becoming a pro at technology! So just bouncing ideas back and forth. (William, Dyad 4 Exit Interview, 12-3-12)

An interesting pattern of planning and teaching with technology emerged over the course of the semester as CTs led integration. With the exception of Ms. Majeres, CTs consistently reported higher numbers of hours invested in planning and teaching with technology, with half as much time spent planning as teaching (see Figure 19). These teachers wanted to grow, but it was hard work and took additional time to explore and integrate technology. Ms. Majeres expressed tension between integrating technology into lessons that may initially take more time and meeting objectives, a requirement for all teachers:

I’ll just try it and if it doesn’t work, it doesn’t work. But if you have 20 kids just looking at you and if it takes your 15 minutes to set it up your i-Teevo (document
camera) and to set up the projector and to get your laptop going, it’s lost time. And I have pretty good behavior management techniques to keep them engaged but that’s still lost instructional time. (Ms. Majeres, Exit Interview, 12-4-12)

**Average Hours Across Dyads**

![Average Hours Across Dyads](image)

*Figure 19. Average Hours Planning and Teaching with Technology across Dyads.*

**Collaborative approaches for new literacies integration.** Using a variety of approaches, CT/ST dyads collaborated to integrate new literacies into their teaching and student learning. Team-teaching, facilitating separate groups, working with the whole class, and assisting individual children allowed dyads to integrate ideas. The data suggest five ST/CT dyad approaches for integrating new literacies: (a) Complete Immersion, (b) Playful Integration, (c) Multiple Individual Exposures to Practice, (d) Switching Roles, and (e) Confluent Integration. I analyze each using the Triarchic Model for Teacher Preparation examining dyad collaborative inquiry process in creating TPACK lessons.

*Complete Immersion.* Complete Immersion requires a dyad leader who is
confident with technology and has a strong interest in using it to teach. Mr. Wichert noted, “You kind of just have to dive in” (Mr. Wichert, Dyad 1 Exit Interview, 12-7-12). Mr. Wichert increased his Pedagogy and Technology Knowledge by combining three ideas from the Technology Conference into a tweeted screencast “Flipped Classroom” approach to teaching math. This dyad immediately implemented professional development on their own, discussing how and why they wanted to “Flip the Classroom” before combining these new components into TPACK lessons. They built on background knowledge to go online to locate videos to learn how to use new tools and had the confidence to take a risk and try.

Complete Immersion also requires complete buy in to the importance of new literacies integration for children and rapid turnaround of ideas. I presented an app in the morning, Dyad 1 used it with children in the afternoon. I brought an iPad for them to use, Mr. Wichert took it to Puerto Rico and taught math from there by creating and tweeting screencasts. Convinced that “Flipping the Classroom” was better for students and knowing that he could create videos in a fraction the time on the iPad as he could on the laptop, Mr. Wichert was the first participant to purchase his own iPad.

It was clear in Dyad 1’s implementation of this approach that CT led new literacies integration and ST supported. CT scaffolded new literacies integration for ST to prepare her to do even more in the next lesson. For example, in the planning process of “Flipping the Classroom” Mr. Wichert had Mikayla set up an Educreations account, then create a math screencast to teach a lesson, which he then tweeted to students. Mr. Wichert noted how he involved Mikayla throughout the planning, teaching, and reflecting process,

She’s made some videos for use in the classroom and that’s just the most obvious
of how we’ve worked together. I think a lot of the time it’s just bouncing ideas off
of one another, and collaborating. Even if I’m doing a lot of the lesson creating
there’s still a part where we talk.” (Mr. Wichert, Exit Interview, 12-7-12)

When planning for Complete Immersion, all ideas are considered with an
openness to trying apps that might better help students. As Mikayla mentioned that all
students wanted to create a Storybird with her after seeing one child e-publish, Mr.
Wichert replied, ”Let’s do that today!” Dyad 1 displayed an attitude of confidence and
willingness to try things for the good of children, turning planning directly into teaching.
They scaffolded new literacies for children, creating screencasts for children to view
before they created their own. Other times when they knew children could accomplish the
task, they empowered them to write stories and post to Edmodo themselves. Building
upon pedagogical content knowledge, the Complete Immersion model adds the
technology component to get students creating at the center of TPACK.

Dyads selecting the Complete Immersion model must be ready to try new things,
convinced that children and teachers need to know 21st century skills just as much as
they need to know assessed content (NCTE, 2007; IRA, 2009, Partnership for 21st
Century Skills, 2009). “It’s been great. I mean it’s kind of like when something clicks in
your mind and you say, “I’m never going back to the old way” (Mr. Wichert, Exit
Interview, 12-7-12). The dyad values input and ideas from both CT and ST, and in this
study the coach. CT and ST wanted to learn and grow and they were open to any new
ideas I brought. “You've helped me a lot this semester, so thank you! Keep on bringing
new ideas and I'll keep trying to implement them” (Mr. Wichert, Log, 12-7-12).

In summary, Complete Immersion requires a strong leader and a willingness to
quickly integrate new literacies. The dyad must collaborate to plan, co-teach, and reflect following the lesson. The data suggest that this model was helpful for both the CT and ST in this study, each leading when they had the greater knowledge. While the CT led most technology initiatives, in a collaborative dyad situation the ST can lead new literacies integration as well:

I would say I more followed his lead as far as integrating technology. Because as I said, I wasn’t really prepared to do a lot of those things. So he decided to do Educreations so as a result of that I learned that application. I had to set up a Twitter account. He’s really taken the lead on mostly all of it. But I think that challenged me to do it as well. So I set up an Edmodo account for our classroom. One thing I guess it was kind of my lead through my professor is Storybird. I did that with one student and the other kids really wanted to do it as well and we ended up doing the whole class being able to create Storybirds. (Mikayla, Exit Interview, 12-7-12)

**Playful Integration.** This new literacies integration approach builds upon teacher beliefs that children, and adults, learn best through play and active engagement. Dyads utilizing this approach should be comfortable playing with technology to learn how to use it, and empowering children to do the same so CT, ST, and children all grow in technology knowledge. Dyad 2 utilized the Playful Integration model as they integrated new literacies. Ms. Langston’s hands-on philosophy of learning transferred into her integration philosophy, children learn new literacies best through play. She believed you should let them experience it not just sit and watch a teacher use the technology.

Ms. Langston planned for both Lauren and her to grow in technology knowledge.
She invested time herself into play with the new iPad device. While she fully utilized coaching support, she also knew that she needed to play on her own to really know how to use the iPad. “Well, I’ll just play with it. It’s all about play, I know it’s about the play” (Ms. Langston, Beginning Interview, 10-10-12). Ms. Langston also encouraged ST to play with topic-related apps in the back of the room while CT taught whole class. When it was time to demonstrate learning, Ms. Langston asked metacognitive questions to empower children to learn how to use technology on their own as well. “Think about some steps that you can take to try and get there” and “You know some strategies to try.” Dyads using Playful Integration need to be comfortable allowing children to try, sometimes fail, and try again. They also ask children to demonstrate technology strategies in front of the class, rather than the teacher always leading. These dyads view process as important as product. They take the time to guide children to use technology on their own, allowing them to choose appropriate technologies to meet learning needs. Play-centered dyads teach children to be lifelong learners knowing that technology is constantly changing and specific apps used today will be replaced by more powerful apps, sometimes within weeks. They are not worried about the child, or themselves, breaking the iPad.

In summary, the Playful Integration approach to new literacies integration puts technology devices into the hands of children and guides their exploration through questioning. Children are encouraged to select apps that best demonstrate their learning and develop confidence in displaying their creations using the technology available. CT and ST, who demonstrate how they play by trying new apps and procedures in front of the children while teaching, also model Playful Integration. By thinking aloud while
troubleshooting the dyad models appropriate steps for children who then try it on their own. Combining new technology knowledge with additional student-centered pedagogical strategies and required curriculum content created TPACK lessons through Playful Integration.

**Multiple Individual Exposures to Practice.** In this approach to new literacies integration one dyad member teaches while the other dyad member explores the technology, trying out apps for specific students, in this case struggling readers. When ST is teaching, CT is in back of the room finding apps with affordances that benefit specific students, then working with those students individually in a more teacher-directed format. Although this approach lends itself to collaboration as needed, regular dyad planning and reflecting is key. All researched apps are shared and ideas are discussed for effective use, increasing technology knowledge in both CT and ST and guiding integration via shared pedagogical content knowledge. In this way the teacher updates the researcher/tutor on class progress as well as needs to inform technology selection. The data show that when STs teach they spend little to no time planning to use technology, making it vital that CTs explore technology and share this learning with ST. Effective collaboration can make this partnership work well.

The dyad should select a variety of apps to use with struggling readers and the class as a whole. Teaching children both practice and creation apps helps them create a digital repertoire of known apps from which they can select to communicate learning in any situation. Ms. Majeres provided multiple exposures to concepts through apps so repetition for learning did not seem tiresome. So selecting a limited number of apps moving from specific to general helps CT, ST, and child build a digital repertoire for
In summary, Multiple Individual Exposures to Practice allows one dyad member to teach while the other researches apps and implements with individual students such as struggling readers. Ideally CT and ST exchange roles so both teach new literacies whole class and with individual students, building on the literature that STs need a variety of classroom experiences to collaborate and co-teach (Kamens, 2007; Yopp & Guillame, 1999). These experiences happened in Dyad 3 when CT resumed teaching whole class as ST transitioned out of solo teaching and began working with individual students the way CT had, demonstrating the influence of the CT in determining how ST will teach (Anderson, 2007). Through collaborative planning and reflecting throughout the semester, ST felt confident to begin teaching new literacies with individual struggling readers, learning vicariously from the successful efforts of CT (Smith, 2001). This approach may also be used with CT and ST teaching individual groups to meet specific needs.

**Switching Roles.** Switching Roles effectively merges a CT with higher pedagogical content knowledge with an ST who may have higher technology knowledge so they merge their teacher knowledge to create TPACK lessons for children. This data followed the literature stating that STs generally have not developed adequate pedagogical skills and knowledge of planning lessons to use technology in ways that prevent possible issues (Choy, Wong, & Gao, 2009-10), while CTs have generally taught longer and developed more content-specific pedagogy. Many STs have grown up in the digital age using technology their whole lives, yet they do not possess pedagogical knowledge to use that technology effectively to teach. Regarding the three areas of
teacher knowledge represented in TPACK, CT and ST may bring different strengths to the dyad. Learning from each other helps both strengthen all three knowledge areas.

Dyad members may switch roles based upon interest, effort, and vicarious learning as they learn by watching their dyad partner (Smith, 2001). In this study Ms. Stout built upon interest, expended effort, and learned vicariously from William as Dyad 4 switched roles as the study progressed. Ms. Stout began the study rating herself lower than William in technology use personally and professionally. She realized that she could learn from her ST, enabling them together to accomplish the many goals she set for the year. Switching Roles is most beneficial when both CT and ST willingly learn from each other as knowledgeable co-learners. By working together Dyad 4 enacted professional development combining William’s technology knowledge with Ms. Stout’s pedagogical content knowledge, resulting in children publishing ebooks. While Ms. Stout knew the writing and publishing process using pencil and paper, William could set up an iTunes account and help troubleshoot how to share the ebook from the iPad to parents’ email.

Throughout a student teaching experience the ST or CT may grow so much in an area of teacher knowledge that they become the leader in that area. As the dyad members Switch Roles they continue to support and learn from the emerging leader so that the dyad can grow even stronger. Discussing roles during planning, teaching and reflecting increase TPACK in both CT and ST. At this point the dyad should set new goals that they can now meet with additional teacher knowledge. When a CT or ST models strong new literacies pedagogy over time the other member will begin to use these strategies until they become a natural part of his/her digital repertoire as well (Smith, 2001).

In summary, Switching Roles can be a natural progression of learning when a
strong CT or ST models new literacies integration using collaborative inquiry to process. When CT and ST collaborate as knowledgeable co-learners they can constantly evaluate roles and decide if they need to make a change or set a larger goal. Encouraging growth of both partners increases the TPACK of the dyad producing learning for children at the strongest level.

**Confluent Integration.** This collaborative approach advances the inclusion of a major new literacies integration project as part of the student teaching experience. While CT and ST may function individually before and after, they must team-teach to accomplish the technology goal. Setting a goal to help children create using technology in new ways requires collaboration of a network of players which may include para, media specialist, parents, another class, other teachers, etc. depending upon the agreed upon project. This Confluent Integration required a flowing together of participants, network, technology, effort, timing, and content to blend into one effort through collaborative planning. This week of student-created new literacies projects became the highlight of the semester for both CT and ST.

Confluent Integration allowed Dyad 5 to help kindergarteners research online and create multimedia presentations. To accomplish their goal Ms. Lisko and Angeline both had to try new things: checking out the laptop cart for the first time, helping 22 kindergarteners log into computers at the same time, teaching kindergarteners to search for websites, open multiple tabs on the Internet, cut and paste, and many other new literacies skills and strategies. In Dyad 5, CT led whole class instruction while ST, para, and coach helped children individually with the project. Children helped each other troubleshoot as they were able. Without the project these kindergarteners probably would
not have learned these skills within regular assignments, and this CT and ST probably would not have team-taught. Planning, teaching, and reflecting for this three day project activated the Confluent Integration both CT and ST noted as the highlight of the semester.

In summary, the data showed that Confluent Integration heightened the student teaching experience for all parties. This model allows CT/ST dyads to participate in any desired role until the project begins. At that point both CT and ST come together to co-plan, co-teach, and reflect as they both learn something new. Following the experience the dyad can return to their original roles, or implement another project and continue to collaborate including team-teaching. Without the study requirement for a student technology project this Confluent Integration probably would not have happened. The need for a technology project motivated CT to collaborate with ST and many others in new ways to accomplish this goal.

**Summary.** Each collaborative approach for new literacies integration provides options for ST/CT dyads to discuss when beginning their student teaching experience together. This research suggested five approaches: Complete Immersion for rapid implementation with children creating using technology, Playful Integration for a child-centered learning approach, Multiple Individual Exposures for the dyad that prefers to work separately or with individual students, Switching Roles to combine separate strengths in teacher knowledge, and Confluent Integration to bring together all components for a special shared project in the student teaching experience.

While each approach varied in the collaborative strategies used to implement professional development, some commonalities emerged. All dyads utilized the
collaborative inquiry approach where CT and ST planned, taught, and reflected to plan TPACK lessons supported by a coach. All participants grew in their technology and pedagogy knowledge, and all dyads taught student-centered activities using technology. Even though all participants volunteered to be in the study and wanted to grow, it was not all easy and it took time. All technology was integrated into required curriculum, but time emerged as a factor in new literacies integration. A need exists to examine time allowed by districts for CTs and STs to plan to integrate new literacies, as well as considering larger blocks of time for teaching subjects in an integrated fashion to facilitate online project-based learning. Finally, without study requirements, loaning of an iPad, and coaching support, it is doubtful if many of the student-centered new literacies integrations would have happened.

**Teacher and Student Growth with Empowerment**

Dyads enacted new literacies integration in their classrooms in various ways. The data from coaching notes, logs, interviews, and observations give voice to empowered teachers who empowered children. Following I discuss the second research question: how do student teacher/cooperating teacher dyads have children use new literacies for learning?

**Teacher resourcefulness led to paradigm shifts.** A teacher’s pedagogical perspectives can drive new literacies integration. Teaching required content using teacher-directed student practice does not automatically add the technology layer and change student activity at the TPACK level (Mishra & Koehler, 2012). The data show that while all dyads commented on the lack of available technology in their schools and their desire for one-to-one devices, each found a way to use the iPad loaned to them for
the study to help students learn.

Dyad 1 creatively tweeted screencasts to children at home to have them view tomorrow’s lesson so the dyad could help them apply learning the next day in class. Knowing that about forty percent of his students had Internet access at home, Mr. Wichert organized a computer station in the lab before school for students who could not access the Internet at home to view the screencast. Rather than saying that children at his Title I school could not learn via the “Flipped Classroom” approach, Mr. Wichert found a way to get them online learning using 21st century techniques. He also purchased an iPad and opened his students to another culture and technology options as he taught from Puerto Rico. This was a very unique move as statistics today say only four percent of teachers purchase their own devices for teaching (Gates Foundation, 2014).

Desiring for children to use these devices, Ms. Langston creatively organized to bring in iPads so each two children had one iPad. She purchased an iPad which students used in addition to several borrowed. “1, 2, 3, 4, 5, 6, 7 iPads. Some are mine, some are the university’s, take 6 back down to preschool. To thank them for letting us borrow their iPads you can read a digital book to a preschool child, and let them turn the pages!” (Ms. Langston, Observation 3, 12-4-12).

Dyad 3 also demonstrated resourcefulness. While they mainly used the single iPad in the back of the room with individual struggling readers practicing needed skills, they also used it with the whole class as a teaching device. When Sarah completed her solo student teaching she used the iPad with a small group to have them create their own graphic organizers. To use the iPad with more students, Ms. Majeres wrote a grant to apply for a class iPad.
Ms. Stout wrote grants, purchased an iPad 4 and projection device, worked with Apple and Best Buy to troubleshoot so she could project and involve students from their desks, repeatedly contacted a principal and teachers in Guam to set up a global connection for her students, and reserved the computer lab for Tech Tuesdays so all second graders could learn digital Word Work. Creating her intricate collaborative network to allow her to accomplish her goals demonstrated a high level of resourcefulness.

Dyad 5 checked out the laptop cart for the first time and taught kindergarteners new literacies skills to successfully navigate online. Ms. Lisko created an eBook that helped a child learn his alphabet and located specific apps to meet the needs of each student. She also taught her para how to use each of the three apps she selected for each child to multiply her own teaching time.

In addition to resourcefulness, each dyad put forth effort to learn to use the iPad with students (Weiner, 2004). Although all CTs and STs volunteered to participate in the study, it was not always easy to integrate new literacies. Lauren bemoaned that there were too many apps to select from and use. It takes time to experiment with and use apps in meaningful learning. Ms. Majeres noted the loss of instructional time when technology does not work. Jointly CTs reported over 150 hours planning and teaching with technology while STs reported over 50 hours (see Table 12). Although new literacies were integrated into the curriculum, this planning time was in addition to regular planning. Why did these CTs and STs invest this impressive amount of time? The data follow the literature: they desired to grow professionally (Clarke, Triggs, & Nielsen, 2014), and they saw students engaged and learning (Guskey, 1995):
At the beginning I was still learning and not so sure of myself. And once I realized that this was like a gateway to so many different opportunities, I decided to get upon myself to learn as much as I could in the time I have with him (ST), and with the iPad and things. And it just took me to another level. I decided I needed to get one too, so I went and got my own. You know every night I’m working a little bit of time to learn a new app or to figure out what would be better for writing, or what would work for reading, or what would be an engaging app to use when we have the kids being able to work independently. So continually connecting it to the curriculum by quarter, connecting what I’ve learned in this class to what I need to do in my teaching because now I’m the technology teacher.” (Ms. Stout, Exit Interview, 12-3-12)
Table 12

Technology Use by Participants Individually and Collectively

<table>
<thead>
<tr>
<th></th>
<th>Total Number of Hours Teaching in Semester</th>
<th>Average hours teaching per week</th>
<th>Total Number of Hours Planning/Semester</th>
<th>Average hours planning per week</th>
<th>Total Number of Classes taught in Semester</th>
<th>Average classes taught per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr. Wichert</td>
<td>24</td>
<td>3.4</td>
<td>12</td>
<td>1.7</td>
<td>74</td>
<td>10.6</td>
</tr>
<tr>
<td>Mikayla</td>
<td>4</td>
<td>.5</td>
<td>6</td>
<td>.8</td>
<td>6</td>
<td>.8</td>
</tr>
<tr>
<td>Ms. Langston</td>
<td>38</td>
<td>6.3</td>
<td>18</td>
<td>3</td>
<td>65</td>
<td>10.8</td>
</tr>
<tr>
<td>Lauren</td>
<td>11</td>
<td>1.4</td>
<td>7</td>
<td>.9</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>Ms. Majeres</td>
<td>5</td>
<td>.7</td>
<td>13</td>
<td>1.9</td>
<td>8</td>
<td>1.1</td>
</tr>
<tr>
<td>Sarah</td>
<td>14</td>
<td>2</td>
<td>5</td>
<td>.7</td>
<td>24</td>
<td>3.4</td>
</tr>
<tr>
<td>Ms. Stout</td>
<td>36</td>
<td>4.5</td>
<td>10</td>
<td>1.3</td>
<td>78</td>
<td>9.8</td>
</tr>
<tr>
<td>William</td>
<td>1</td>
<td>.3</td>
<td>1</td>
<td>.3</td>
<td>5</td>
<td>1.3</td>
</tr>
<tr>
<td>Ms. Lisko</td>
<td>2</td>
<td>.3</td>
<td>2</td>
<td>.3</td>
<td>6</td>
<td>.9</td>
</tr>
<tr>
<td>Angeline</td>
<td>5</td>
<td>.8</td>
<td>1</td>
<td>.2</td>
<td>4</td>
<td>.7</td>
</tr>
<tr>
<td><strong>CT Average</strong></td>
<td><strong>105 Total</strong></td>
<td><strong>3</strong></td>
<td><strong>55 Total</strong></td>
<td><strong>1.6</strong></td>
<td><strong>231 Total</strong></td>
<td><strong>6.6</strong></td>
</tr>
<tr>
<td><strong>ST Average</strong></td>
<td><strong>35 Total</strong></td>
<td><strong>1.1</strong></td>
<td><strong>20 Total</strong></td>
<td><strong>.6</strong></td>
<td><strong>55 Total</strong></td>
<td><strong>1.7</strong></td>
</tr>
</tbody>
</table>

Ms. Majeres described a paradigm shift for her when she realized that this experience changed the way she thought about technology. At her old school there was no computer teacher, so she just took students into a website to practice skills or type. Now she possessed many tools that she only began to explore with children. By the end of the study she expressed her change in effective technology use with children as well as her desire to continue to grow as a CT modeling technology integration in this way:
You use it to learn, not just learn how to use it!...And you have to understand that it’s not just going in and looking at A to Zap, and going to Microsoft Word and typing your spelling words, because that’s what I did, for 3 years! It’s something else that you can try. I don’t think I modeled very well how to use it in a whole group with the laptops and how to scaffold that, and how to use the screen. (Ms. Majeres, Exit Interview, 12-4-12)

To summarize, data showed teacher growth and empowerment through resourcefulness and effort as each participant added Technology Knowledge to their TPACK repertoire. All invested time to plan to teach new literacies that amounted to an average of zero to three hours per week, a component that will need to become part of the lesson planning process beginning with STs. Dyads made 69 references to increased motivation and engagement in students and in themselves, so they saw a difference because of their efforts. Three of five CTs purchased iPads during the study, and four of five CTs reported writing grants for iPads, all of which have been fulfilled as of this writing. CTs noted paradigm shifts as they saw their planning and teaching transform to include the technology component, translating into iPads used as learning tools rather than teaching tools.

**Students learn with new literacies.** The data from this research support the idea that teaching with technology does not by itself change a teacher’s regular teaching pedagogy (Cuban et al., 2001). While I encouraged student-centered learning -- putting devices into the hands of the learner to let them create, each participant enacted this with students in different ways at different transitional points in the semester. When dyads invited me to observe their classroom I probably saw the best of the ways dyads involved
children in learning with new literacies. Ms. Majeres indicated that she was using
technology to practice skills because I was coming to observe. Weekly logs noted many
lessons where using the document camera to project so all students could see, playing
music during writing, or showing a video was the participants’ best use of technology.

Observed lessons varied from teacher-centered lesson enhancement using the
SAMR terminology defined above --Substitution and Augmentation (Puentedura, 2009)--
where technology replaced or added components to teacher-directed lessons, to student-
centered lesson transformation using SAMR Modification and Redefinition, where
technology completely redesigned the task (see Table 13). Augmentation lessons
involved children in four ways: (a) whole class takes spelling tests at Spelling City on
one-to-one laptops, (b) one child responds on the one provided iPad coming to the
projection cart in a whole class lesson, (c) individual struggling readers practice skills
one-on-one with CT, or (d) whole class watches a webcast and discusses. In Modification
lessons children created presentations and screencasts using apps and shared in class, or
logged into district websites to do math or video concepts. In Redefinition lessons
children made decisions about technology used, created multimedia projects and shared
online (for specific lesson descriptions see Appendix K).
Table 13

Overview of Observed Lessons by SAMR Level

<table>
<thead>
<tr>
<th>Dyad</th>
<th>Lesson Enhancement</th>
<th>Lesson Transformation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SAMR-Substitution</td>
<td>SAMR-Augmentation</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Total across dyads</td>
<td>1</td>
<td>10</td>
</tr>
</tbody>
</table>

A limiting factor determining child use of new literacies was the number of technology devices available. Many of the Augmentation lessons could be completed by children if they had devices, rather than as a teacher-led activity with one student responding. For example, Sarah created a graphic organizer from ideas children offered as they reviewed plants. Later in the semester, when Sarah was not teaching whole group, she worked with a small group to have them actually create their own graphic organizer. Grouping provided a challenge for each dyad regarding new literacies integration. While providing one iPad assured that there would be some technology available to each dyad, having only one iPad challenged dyads to use it in a class situation. Thus, the variety of teacher uses ranged from individual children, to small group, to whole class.

Teaching philosophy also played a role in the type of new literacies activities children completed. For example, Ms. Majeres worked mostly with struggling readers and special needs students requiring one-on-one attention. She selected iPad activities to
provide additional practice on necessary skills that she could have special needs children complete when they came back to her desk. These practice activities were teacher-directed and SAMR-Augmentation by nature. Ms. Majeres also worked with gifted students doing research in the computer lab where each student had a laptop. She set a goal to get an iPad indicating her desire to use it more. The key is integrating new literacies into the curriculum in child-empowering ways.

The Observation Protocol for Technology in the Classroom rubric (OPTIC) described above (see Appendix H) demonstrated the ways dyads designed new literacies lessons as well as the student uses of technology in those lessons. During each observation in addition to completing the observation protocol, I also scored each OPTIC item on a scale of 1-5 with 5 high to see how technology was integrated. As I discuss key findings using the shortened terms in the table, I will include the actual definitions from the OPTIC (2004) in quotes to further clarify. Overall, primary classrooms scored lower than intermediate classrooms (see Table 14).
Table 14

*Observation Protocol for Technology in the Classroom Descriptive Statistics (OPTIC)*

<table>
<thead>
<tr>
<th></th>
<th>Primary</th>
<th>Intermediate</th>
<th>Overall</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teacher Design</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tech Skills Embedded</td>
<td>3.89</td>
<td>4.83</td>
<td>4.27</td>
<td>5</td>
</tr>
<tr>
<td>Effective Use</td>
<td>3.88</td>
<td>4.00</td>
<td>3.93</td>
<td>5</td>
</tr>
<tr>
<td>Developmentally Appropriate</td>
<td>3.11</td>
<td>4.50</td>
<td>3.67</td>
<td>5</td>
</tr>
<tr>
<td>Value Added</td>
<td>2.45</td>
<td>3.00</td>
<td>2.65</td>
<td>5</td>
</tr>
<tr>
<td><strong>Student Uses</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On Task</td>
<td>4.56</td>
<td>4.83</td>
<td>4.67</td>
<td>5</td>
</tr>
<tr>
<td>Engagement</td>
<td>3.55</td>
<td>4.33</td>
<td>3.82</td>
<td>5</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>2.40</td>
<td>3.50</td>
<td>2.81</td>
<td>5</td>
</tr>
<tr>
<td>Collaboration</td>
<td>2.14</td>
<td>2.67</td>
<td>2.38</td>
<td>3</td>
</tr>
<tr>
<td>Planning</td>
<td>1.20</td>
<td>1.67</td>
<td>1.38</td>
<td>3</td>
</tr>
<tr>
<td>Choice</td>
<td>1.10</td>
<td>1.40</td>
<td>1.20</td>
<td>3</td>
</tr>
<tr>
<td><strong>Overall Score</strong></td>
<td>2.80</td>
<td>3.61</td>
<td>3.09</td>
<td>4.27</td>
</tr>
</tbody>
</table>

**OPTIC teacher design.** Regarding teacher design of new literacies, both primary and intermediate classrooms scored highest on technology skills embedded: “Most specific technology skills are embedded and learned in the context of core curriculum lesson objectives.” Dyads did integrate new literacies skills directly into curriculum objectives helping children immediately practice the skill in authentic context within subject time provided. For example, children learned to cut and paste as they inserted pictures into a multimedia presentation, not as a computer lesson on cutting and pasting. The second highest design score for *primary grades Kindergarten to two* classrooms was
effective use: “Most students exhibit skill in the effective use of available technologies at or above grade and ability levels.” In the kindergarten lesson on Internet search, some children knew some buttons teachers did not know that they knew including the world (Firefall) and forward/backward arrows. iPad apps were easy for most children to navigate, some special needs students needed assistance with the activity and some children needed assistance logging into websites or using the correct number of fingers to scroll. The second highest design score for intermediate grades three and four classrooms was developmentally appropriate: “student use of technology is based on their cognitive abilities and physical needs.” Teachers designed reading centers where children read leveled books they could understand and navigate online. The lowest design score for both primary and intermediate classrooms was value added: “most technology uses represent learning activities that could not otherwise be easily done.” Children were motivated to research and locate images more efficiently in many projects as they use some of the affordances of the technology. They could do this using print sources, however they would not learn the new literacies skills of online searching. But the real value add happened when children began to share multimedia presentations and screencasts online with parents, peers, and school administrators and receive feedback, going beyond what could be done easily without technology.

**OPTIC student uses.** Regarding student uses of technology observed during digital learning activities, two areas emerged as highest for both primary and intermediate: on task and engagement. (a) The highest area for student use was on task. “In using technology, most students are focused on the intended curricular objectives.” Students used the laptop as a learning tool and navigated only the sites used to complete
the lesson. Sometimes with one-on-one practice the CT did not state the objective for struggling readers, however CT brought up the app and watched as the child used it. When only one student participated at a time as in William’s spelling app lesson other students lost focus on the curricular objective because of lack of devices. When Ms. Stout began helping children create eBooks she mainly used the technology so students focused on what she had on the iPad.

(b) Engagement emerged as the second high area for student behavior. “Most students are highly engaged in the use of technology.” All teachers reported student engagement when using technology. One example is the reading series online vocabulary work with Ms. Majeres featuring an online format including unique screen presentation, novel voice to pronounce words, and ability to set word level to challenge individual needs to motivate children, motivational factors suggested by the literature (Shell et al., 2010).

**OPTIC Areas for growth.** The three lowest areas for student technology use at both the primary and intermediate grades were choice, planning, and collaboration. The lowest area for both levels was choice: “most students are independently choosing the technologies appropriate to their learning objectives.” Only one lesson by Ms. Langston empowered children to select the app they felt would best demonstrate the word problem they created. This choice area required students to create a digital repertoire of apps and know the affordances of each to make an appropriate selection, especially in the limited timeframe allowed in this lesson. In most lessons, teachers told children the app or website to use for the project. Ms. Stout allowed children to choose to independently read a print or digital book, however the digital book needed to be from the *TumbleBooks* site
providing scaffolded choice.

Related to student choice, planning was the second lowest area for both levels: “students are highly involved with their teacher and peers in planning for the use of technology in a unit or lesson.” In one example, Ms. Majeres selected an app for a special needs child to use. The child stated that he did not like technology games and she had to encourage the child to play the game. Perhaps providing an option of two activities and inviting the child to help plan the session would be motivational. Again children offered to plan to do more technology themselves during lessons, however teachers were still learning and tended to remain in the teacher-directed framework.

The third area for student growth was collaboration: “In group activities using technology, a high degree of collaboration is exhibited.” Although Sarah reported in a weekly log having children create graphic organizers in small groups, I did not observe grouping with technology usage. This seemed to be the most challenging use of technology for dyads preferring to work individually with one iPad or whole class with a laptop for each student. Ms. Stout demonstrated collaborating with a child to publish eBooks. Even in independent stations, children provided and received assistance from each other when troubleshooting technology. William could have strengthened his spelling lesson by engaging children collaboratively to involve everyone. More often I observed teacher-directed lessons where children completed the task individually. Interestingly this study of collaboration found this 21st century skill of collaboration relatively new for ST/CT dyads and hardly a concept to incorporate for the children they teach.

The data showed problem solving ranking in the middle of student uses but
highest of the 21st century skills: “problem solving and higher order thinking is evident in most students’ activities.” Children problem solved in multiple ways: troubleshooting the technology to reach the task, incorporating affordances of technology into the task, and completing the task itself. When Ms. Stout reached the transitional week she began scaffolding children’s problem solving to create eBooks by asking guiding questions such as, “What do you type into the search engine to get pictures? How do you save the picture?” Do you remember how to make it bigger?” (Ms. Stout, Observation 2, 12-6-12).

**Summary.** CT/ST dyads involved students in using new literacies in a variety of ways. While slightly more than half of lessons observed were teacher-centered SAMR Substitution or Augmentation, the other half were student-centered SAMR Modification or Redefinition. Dyads taught children many new literacies skills and strategies (see Figure 20). Next steps for teachers include involving children more in planning to use technology in lessons, developing digital repertoires of apps and websites for themselves and the children, empowering children to choose appropriate technology to complete tasks, involving children in collaborating to complete tasks and grouping to effectively use available technology.
Figure 20

*New literacies skills and strategies taught during the study*

<table>
<thead>
<tr>
<th>New Literacies Skills</th>
<th>New Literacies Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening multiple tabs</td>
<td>Asking questions</td>
</tr>
<tr>
<td>Cutting and pasting</td>
<td>Searching online for answers</td>
</tr>
<tr>
<td>Saving images</td>
<td>Evaluating websites</td>
</tr>
<tr>
<td>Sizing images/text</td>
<td>Critical thinking</td>
</tr>
<tr>
<td>Locating images in photo library</td>
<td>Problem solving</td>
</tr>
<tr>
<td>Erasing online</td>
<td>Posting to Edmodo or blog</td>
</tr>
<tr>
<td>Navigating to next screen</td>
<td>Creating voice recordings</td>
</tr>
<tr>
<td>Logging in/out/passwords</td>
<td>Publishing/sharing online products</td>
</tr>
<tr>
<td>Highlighting online</td>
<td>Creating screencasts</td>
</tr>
<tr>
<td>Typing/centering text</td>
<td>Reading online</td>
</tr>
<tr>
<td>Scrolling</td>
<td>Creating search terms</td>
</tr>
<tr>
<td>Moving word cards on screen</td>
<td>Creating page layout</td>
</tr>
</tbody>
</table>

**STs and CTs Both Become Learners when New Literacies Integration is an Added Focus**

In this final section I discuss themes as they relate to the final research question:

Does an emphasis on technology integration change the collaborative nature of dyads? If so, how do cooperating teachers respond? How do student teachers respond?

**Dyad collaboration with new literacies integration.** The data from this study
support the idea that collaboration between STs and STs with the support of a coach leads to innovative student teaching. So many numerous and specific quotes arose relating CT and ST reactions to the additional new literacies integration component. All participants had volunteered individually to participate in the study so they were interested in learning more about new literacies integration at some level. That being said, there was no way for them to fully comprehend at the time of agreement what that commitment would look like when they were in the midst of it. Dyad 2 expressed feeling overwhelmed in the first few weeks, “It was like first week she (Lauren) cried and I was ready to cry. Second week, OK that’s exactly how our worlds have worked. I was like, ‘What did I commit to?’ Every time I filled out those logs I was like, ‘What did I get into?’” (Ms. Langston, Dyad 2 Exit Interview, 12-6-12). But Ms. Langston assumed a leadership role, began learning all about the iPad, purchased an iPad, built student digital repertoires, allowed children to choose apps, create projects, and share them in front of the whole school. By the end of the study Ms. Langston commented, “When I talked to my peers in the building, I feel like I have been so blessed to have this experience because I felt like I got more out of you as my coach,” (Ms. Langston, Exit Interview, 12-6-12). This comment supported the finding in Scot (2004) that technology coaches assisted teachers with technology and energized the school through these teachers and their updated pedagogy.

Dyad 3 related the additional time it took to set up for lessons involving technology that sometimes did not work, again something she could not have known before trying it on her own. Sarah noted, “I think I feel like I was always so rushed to think about what I could do next and how I could incorporate that technology” (Sarah, Exit Interview, 12-4-12). In addition, Dyad 3 commented that they felt pushed to try
something new and held accountable, perhaps more than they expected.

Because you could say, ‘Here Ms. Majeres, here’s an iPad.’ And I could say,
‘Thanks, I’ll play with that.’ But when you were saying, ‘How are you using it?’ I
should probably find out a way to use it…this whole process has also pushed
Sarah because she was very tech timid.” (Ms. Majeres, Exit Interview, 12-4-12)

**ST insights about dyad collaboration with a new literacies focus.** Looking across
ST responses regarding this additional focus, the data reveal individual thoughts that
overlap in common themes: benefit worth the commitment, fluid dyad roles, opportunity
to lead, importance of collaboration, and excitement in teaching.

(a) **Benefit worth the commitment.** Mikayla’s quote represents sentiments shared
by each ST, “I think it was a valuable learning experience. At first I thought...I don’t have
time for this. But I think it was a really good experience. And I know why we did it at the
beginning of the year, at the same time I wish somehow that we could continue it”
(Mikayla, Exit Interview, 12-7-12). Again, in an email Angeline stated, “Thank you for
allowing me to be a part of this, even though I am slacking this week. I appreciate the
opportunity to learn more about how to use technology in the classroom” (Angeline,
Email, 10-15-12). Both Masters level STs initially expressed concern about time because
they took courses at the same time as student teaching. But by the end Mikayla described
the highlight of the semester as “Flipping the Classroom” because it made students think
critically and as parents watched the screencasts they learned the concept right along with
their child, an unexpected benefit.

William revealed, “This was the best part of the whole student teaching!”
(William, Exit Interview, 12-3-12). Additionally, he commented upon his learning with
the additional technology component:

This is one thing I have really enjoyed doing. I was actually really nervous about doing it at first with the capstone and I was thinking, “Oh no, this is going to be a lot of work.” But I think that this was the most beneficial thing that I’ve ever chosen to do during my whole teaching experience. I have definitely taken more out during my student teaching experience here doing this technology study compared to maybe during my math block or lit block. I was involved with that but here, again its students taking over their learning. I kind of took over my learning. I decided to participate, you know Ms. Stout and I both decided to participate in this so again I took over my learning and it was a really great choice because I’ve learned a lot from this, and I’ve grown a lot from this. (William, Exit Interview, 12-3-12)

(b) Fluid dyad roles and opportunity to lead. Undergraduate STs commented on their fluid roles in these collaborative dyads. Angeline noted that she pretty much took her CT’s lead, but Angeline took the lead in e-publishing. In another example, although Sarah was originally the more “tech timid” and looked up to Ms. Majeres as the experienced leader, it was Sarah who ended up doing the student technology project that her CT did not do, so leadership roles changed depending upon the project. Each partner brought different technology experience. For instance, Sarah knew Dells, Ms. Majeres knew Apple. Dyad 3 further discussed their collaboration process; they started slowly. First, Ms. Majeres explored apps she knew from her son. Second, Sarah shared how she used the iPad at the university reading clinic. Thirdly, they integrated new literacies into their regular objectives. This process pushed the more “tech timid” ST to grow in areas
she may not have in the traditional hierarchical student teaching model, where ST may be hesitant to try something new in the classroom (Anderson, 2007; Smith, 2007). In the end she commented that it was just nice to have that extra experience using technology. Dyad 5 shared similar experiences of bringing varied areas of expertise to the process so both CT and ST led in different areas of integration.

In Dyad 4, William emerged as the technology leader, a leadership opportunity that he may not have experienced without this added technology component: “I learned a lot from William because this comes pretty natural to him, and me not so much. Because I hadn’t even held the iPad in my hand until I went to the Technology Conference, so he showed me” (Ms. Stout, Dyad 4 Exit Interview, 12-3-12). During the coaching session on 11-7-12 William understood integrating technology into required curriculum rather than needing a separate time for it. He questioned how they could teach more effectively using technology and presented ideas to do so: blogging with Guam for Flat Stanley and using an app to practice spelling Word Wall words. Although he was still learning various pedagogies, William seemed to see a natural connection between technology and content in the TPACK model. With pedagogical input from Ms. Stout they created TPACK lessons. While CT felt the burden of sticking to the script for most subjects, ST freely suggested technology-integrated methods to accomplish the same goals in different ways. Both CT and ST valued ideas generated by the other, as the next week they watched a podcast on using blogs in collaborative activities to consider William’s option for the Guam project.

(c) Importance of collaboration. Multiple STs related the common theme of the importance of collaboration in this integration process. This collaboration also informed
the undergraduates’ senior capstone projects where they chose to highlight their proficiency to integrate new literacies in teaching:

Collaboration for this whole semester was the biggest part in making this successful for everyone... I think for us it (new literacies integration) really effected that collaboration because we had to come together just as a team and kind of thought this is what would work well and this is what wouldn’t work well. And also some of the issues we kind of would come up with as we deal with technology. Because there’s always issues that come up. I know we had an issue with the projector just getting it to project, and we’re still trying to figure that out. But collaborating together and trying to figure that out and everything like that. So I think introducing these new literacies its going to take collaboration on our part to work all the bugs out and get everything where we want it. (William, Exit Interview, 12-3-12)

Dyad 5 discussed their increased learning by working together on new literacies integration:

Ms. Lisko: Anytime you can collaborate you are going to have better ideas.

Angeline: And it’s nice to be able to brainstorm with somebody too...

Angeline: Collaboration, It was really good I know she has more experience with Kindergarteners so it was really great to see how she used it as a veteran in a classroom. Because I would have never guessed of using Google Docs for Kindergarteners. It definitely gives me faith that even if they are young like kindergarteners they can use Google docs. Yeah. (Angeline, Dyad 5 Exit Interview, 12-3-12)
Ms. Lisko: Well I think there was more emphasis on trying to integrate it into what we were doing. I had never even used the mobile lab before. And because of this I was, well let’s see what we can do. And I learned about jump codes, and all of that and I wouldn’t have known any of that. (Ms. Lisko, Dyad 5 Exit Interview, 12-3-12)

(d) Excitement. Finally, STs expressed excitement as part of a dynamic dyad where ST, CT, and children were all excited about learning using new literacies:

I think the highlights for it (the ST semester) would be really when we started working this technology, and just seeing as we both learned new things to see how excited we both were getting. But not only that to see how excited the kids were getting about it too. (William, Exit Interview, 12-3-12)

Sarah also recorded learning that students really enjoyed getting to use the iPad for assessment. ST involved children in sharing what they knew about the life cycle of a plant as she created a graphic organizer on the iPad organizing their thoughts as a review. Sarah noted positive student response: “I learned that most students are more engaged when technology is used” (Sarah, Log, 10-26-12).

CT insights about dyad collaboration with a new literacies focus. CTs responded in ways that reflected the collaborative inquiry process in action reporting increased levels of planning, co-teaching, reflecting, bonding, and excitement.

(a) Planning. Ms. Lisko remarked that even though her ST was planning the rest of the day by herself, they planned the student technology project together to troubleshoot how students could save their work. Ms. Majeres commented how the added focus on technology influenced their planning and how their different planning styles helped them
try different ideas with new literacies:

Well I think it was something else to talk about. Like we talked about how to teach guided reading, it was just one more facet...I think I took more of the try it and see how it goes, and Sarah took more of the, I’m going to plan something out and really think deeply about it. But I think it worked. More teaching experience you are able to shoot from the hip more.” (Ms. Majeres, Exit Interview, 12-4-12)

Ms. Stout also commented about the way both CT and ST added technology knowledge to planning:

We sat down and planned out our curriculum for a week in advance, and then I would say, hey we could use the technology this way, or we could project this, or different things. And then he (ST) would do the same thing and say, we could take these two apps and use them to create books. So I would say just bouncing ideas off of each other and seeing how that would connect with what we had to teach. (Ms. Stout, Exit Interview, 12-3-12)

(b) Co-Teaching. The second area CTs noted the new literacies focus impacting was teaching. Several CTs noted the benefits of a second teacher to work with when implementing something new. Ms. Majeres explained it like this, “Having a student teacher allows you to do things where if it were just you it would be difficult” (Ms. Majeres, Exit Interview, 12-4-12). And her CT echoed the benefit of integrating as a team:

I mean I think that it brought something new to the table, and if something wasn’t working I could just say ’Ms. Majeres, come help me’ or just having that extra person there for support. And definitely bouncing ideas off of each other, if we
found new apps, or I’ll let her know that I found this to be helpful. (Sarah, Exit Interview, 12-4-12)

Mr. Wichert took it one step further explaining his need to talk things out with a collaborator before beginning something new and then encourage one another along the way, “If I wouldn’t have had a student teacher I probably wouldn’t have done it (the study). So there’s like an accountability (Mr. Wichert, Dyad 1 Exit Interview, 12-7-12). Ms. Langston summed up CTs’ valuing of a ST when integrating new literacies, “Like a second teacher! It’s like co-teaching. Because students are at different levels so it’s the scaffolding thing that you are able to do with a co-teacher (Ms. Langston, Dyad 2 Exit Interview, 12-6-12). And Ms. Stout clarified that not just any ST/CT dyad would participate in a new literacies intervention, “You have to both want to do it to make it work” (Ms. Stout, Exit Interview, 12-3-12).

(C) Reflecting. The third area CTs commented upon when new literacies integration was added to the student teaching experience was reflecting. Ms. Majeres described reflecting throughout, not just following teaching, “(It’s) nice to have somebody to talk to all the time, and nice to have someone to bounce ideas off of. I think when you have someone in your room who asks questions it makes you more self-reflective” (Ms. Majeres, Exit Interview, 12-4-12). She went on to explain the way reflection changed the way she thinks about technology today, “Now they can use it to learn, not just learn how to use it!” (Ms. Majeres, Exit Interview, 12-4-12)

Mikayla also described the importance of reflecting together when implementing new literacies:

Mr. Wichert said, “OK we are going to do this (screencasts) in the
classroom.” Forced me to learn it, it didn’t force me but it challenged me to learn those so I would be able to use those (screencasts) because obviously I need to be able to teach the students and help them. So I had to be able to use it as well. And then Mr. Wichert and I could obviously talk about it, this is working, or maybe this really isn’t working and we need to try a different angle so it does. So it set up opportunities for us to reflect and reassess. (Mikayla, Exit Interview, 12-7-12)

Both CT and ST demonstrated reflecting over the additional technology component. Mr. Wichert questioned whether it was cheating to tell children how to use SpellCheck to locate possible spellings of words when writing online. Additionally, Mikayla responded after reflecting on a lesson she taught, “Technology is beneficial when it allows you and your students to see things they otherwise might not be able to see. While we did see several microorganisms beneath the microscope, the website identified them for us and allowed us to see a wider variety of creatures” (Mikayla, Log, 10-19-12). Sometimes dyads just needed to teach the lesson to see the added benefits for children in TPACK lessons.

Ms. Lisko reflected about the reason for a child’s growth after collaborating with the para to create an alphabet book using pictures of people and things important to a special needs child. The para used this eBook with this child in the coming weeks, with Ms. Lisko noting his rapid growth in letter knowledge:

I think the iPad apps are fantastic. Trey went from knowing 3 letters to knowing 40 in a month of using an iPad eBook app, and I don’t think that is a coincidence. I think part of it was there were pictures of people he knew that he was associating them (the letters) with. And I think there was just a difference, kids
love technology. So he wanted to do it, it wasn’t just, ‘Oh I’m doing flash cards again.’ We have a lot of people working with him several times during the day, but I really think that that made a difference” (Ms. Lisko, Dyad Exit Interview, 12-3-12).

(d) Bonding. CTs described a fourth area that emerged in this student teaching experience incorporating a new literacies project together. A bond formed as ST and CT worked together to accomplish something neither of them had done before. Ms. Langston described how it bonded them together in this study:

I think it gave us a bond. It gave us something to bond around. OK is this difficult for you, and then it’s difficult for me too. So it gave us a talking point each week to talk about. (Ms. Langston, Exit Interview, 12-6-12)

Ms. Stout pointed out how this added technology component created an entirely new student teaching experience unlike any she had ever participated in before:

I would say definitely the technology piece has changed the way that we bounced ideas off of each other, or like things that we came up with that I haven’t ever come up with with another student teacher because we didn’t have, I didn’t have the technology knowledge or the know how or even the equipment at my fingertips to even use that. An overhead, that’s like the biggest thing we used to have. Ha! Really I would say that has increased the amount of things you can do, and collaborating together kind of brings you together. And it kind of makes you, “Hey what can we do with this?” or “How can we use this?” Or “this would be good.” (Ms. Stout, Exit Interview, 12-3-12)

Ms. Stout and William discussed this team situation further and shared key
insights, that this added emphasis gave them something to go through together creating a bond when both are learners, where the ST still respects the CT as a leader but the CT has to learn to be open to new things:

William: I think it’s important... It’s like teamwork and just building that relationship between the two (CT and ST). For instance, having this technology study for us both to go through, we both were in the learning process. And even though I know a lot about technology, we had to work together and we had to come up with ideas and so we were learning at the same time. And so we were just going through that learning process together. It kind of again brought that relationship together because we were able to talk about it, come up with some ideas together and everything, and it was kind of neat to see that. (William, Dyad 4 Exit Interview, 12-3-12)

Ms. Stout: I think it kind of puts you on the same playing field. Because having a student teacher, they know that you are the lead teacher and they have always looked up to you as the lead teacher. Where I think this kind of gives you an equal feeling where you are kind of going in together on this, in this one area, and learning things together. So I think that is kind of nice because I believe it makes the cooperating teacher have to be open to trying new things, or wanting to accept that new learning and trying to incorporate that into your teaching. (Ms. Stout, Exit Interview, 12-3-12)

Additionally Ms. Stout discussed the online bonding that happened within and between dyads through “getting the social network going...Edmodo is a great tool for communicating collaboratively with many people in the field of education. I want to use
this more and invite others to use it!” (Ms. Stout, Log, 11-16-12).

(e) Excitement. Echoing the STs theme of excitement with this new literacies focus, CTs also talked about being re-energized in their teaching. Mr. Wichert shared his excitement with the challenge of something new and the possibilities new literacies integration holds for learning:

It’s been fun trying something drastically new. Because teaching kind of gets old in so far as the curriculum doesn’t change so sometimes you get stuck in a rut...But the good stuff is just kind of putting a challenge into your work, because everyone likes challenge. Everyone likes autonomy but you need challenge in that too…It’s been fun to implement new things...Having two people in the classroom trying different things that really helps. I wonder what we will be doing by the end of the year, you know! Even if we don’t introduce any new sites or new anything, even by the end of the year just honing the craft of what we are doing now with what we’ve got. (Mr. Wichert, Exit Interview, 12-7-12)

Mr. Wichert was equally excited because of the individualized growth children in his class exhibited, “Children are creating videos at a variety of computer, math, and writing/speaking levels” (Mr. Wichert, Observation 2, 11-19-12). Mr. Wichert empowered the children in his class to locate, search, create, post, review, and troubleshoot; which they did proficiently and with excitement.

Ms Stout also reported excitement in children using multiple apps to create one eBook project, in a process now known as app smashing. She noticed furthered learning (Guskey, 1986) as children asked to do more when using the iPad:

The kids pay attention when we use engaging technology that links to the
objective we are teaching...That kids are excited about using the iPad and are asking me to pick them! :) They want more time with these kinds of tools and it's highly motivating for them. (Ms. Stout, Log, 10-19-12)

Ms. Stout further commented why she was motivated to integrate technology:

I learned that kids are highly engaged when having technology at their fingertips! They all raised their hands when I asked who would want to use the laptops or iPad next. They enjoy when they see the final product of their written stories for quarter 1...Kids LOVE it!!! They are more engaged with it and they will work hard to get time to use it! Your options are endless when using technology in the classroom! (Ms. Stout, Log, 11-9-12).

**Focused coaching makes a difference.** The data supports technology coaching comprising a key component of this collaborative student teaching model. In this study the coach assisted CT and ST in a non-evaluative manner so dyads did not feel pressure to be graded and were free to integrate new literacies in transforming ways (Campbell, 1976). This supports the literature that shows that STs often choose safe teaching methods when being observed by the supervisor (Cornu & Ewing, 2008). Coaching supported dyads providing apps and teaching ideas, troubleshooting technology issues, observing and providing feedback, and most importantly by building a trusting relationship with each participant. This relationship continued to grow beyond the study as coach, STs and CTs shared resources and opportunities for participants to share the new literacies skills they learned in the study with other teachers and preservice teachers (see Table 15). CTs and STs both learned through this study and then transferred their learning to others with opportunities provided by the coach, expanding their influence.
Table 15

*Coaching codes*

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*Instances of coded data. Numbers that increased following the end of the study are noted in bold in the far column.*

CTs and STs noted collaboration with the coach weekly in online logs, coaching
notes, emails, and interviews. Ms. Lisko related the critical role of the coach in this study saying that she would have participated in this study of new literacies integration even without a ST, but she would not have done it without a coach. “(The) key was just participating in the study group, I was like “oh well I have to do something. You know you’re not going to change unless you are almost forced to” (Ms. Lisko, Exit Interview, 12-3-12). Teachers are busy, so are student teachers. Without the encouragement of a coach, a dyad in the middle of student teaching would not likely begin a new venture on their own. However, with the support and encouragement of a coach these five dyads did.

Ms. Majeres similarly noted the accountability that a coach brought to the situation:

I think that what you did was kind of just push you to try something new, in a nice way. Because you could say, “Here Ms. Majeres, here’s an iPad.” And I could say, “Thanks, I’ll play with that.” But when you were saying “how are you using it.” I should probably find out a way to use it. (Ms. Majeres, Exit Interview, 12-4-12)

The weekly log required participants to document how they were collaborating and integrating new literacies. Some participants used the iPad in their class when they may not have, because they had to report use in the log. Also the observations caused some dyads to integrate new literacies for me to observe. So all the accountability pieces were necessary to encourage dyads to do all that they did in this brief twelve-week study.

Ms. Langston commented upon the need for coaching to clarify information presented in a brief ten-minute staff meeting on Edmodo, an example supporting the need for ongoing new literacies professional development including coaching in the literature
This CT just needed to know that someone would help her to motivate her to go way out of her comfort zone regarding new literacies integration. She had the desire, she volunteered to participate in the study, I brought her an iPad to use and helped her learn how to use it effectively with students. For follow up support, she was willing to complete the accountability pieces required:

I went to a staff meeting and had a ten-minute briefing on Edmodo. If you (coach) weren’t in my life, I’m serious, that coaching piece that you did on the side made a big difference. All those iPad apps that I tried. I would have never gone ahead and bought an iPad. And I know you weren’t even pushing iPad. You told me Kindle, whatever works. But I wouldn’t have taken that big step forward. Even though I’ve been itching to do it, I finally was able to do that. But the coaching that came from you was like that accountability piece. I am going to come to you for at least a half hour a week. Then log on and document what you are doing. So that accountability piece, you’re not just sending me an email saying try this app, try that app. You actually coming in and saying, “Now what do you need from me? Do you want to talk about the cloud? Do you want to talk about Edmodo?” So those things actually brought a little bit more clarity. Because that ten-minute meeting, she went on about it, but the reality, and they had us sign on and that was about all we could do in ten minutes. And there was absolutely no follow up. (Ms. Langston, Exit Interview, 12-6-12)

Ms Langston further noted how the resources they received helped the dyad plan lessons that taught children content and new literacies. Reading the rubrics for scoring student technology projects exposed these dyads to ISTE, Common Core State Standards,
and State Multiple Literacy Standards in a focused manner, informing new literacies standards which they included in lessons.

Ms. Stout appreciated the connection to current research at the university that the coach provided:

And working with you has been great. Having you come in and kind of trouble shoot with us, and giving us ideas has been the best. Because we have that connection with the university. You’re on the leading edge. You know what’s coming even before the elementary schools do. And just having that piece has been really beneficial to me. (Ms. Stout, Exit Interview, 12-3-12)

**The Triarchic Model of Teacher Preparation.** The data from this new literacies integration study supports the important roles of ST, CT, and Coach. The Triarchic Model of Teacher Preparation proceeds from this line of research incorporating a coach who supports the CT/ST dyad integrating technology, content, and pedagogy knowledge to create meaningful learning opportunities for children. While much professional development focuses on general technology knowledge alone (Borsheim, Merritt, & Reed, 2008), a technology coach can individualize professional development for teachers much as teachers tailor instruction for their students (Brenneman, 2014). This coaching model helps CTs and STs integrate new literacies together in ways teachers indicated helps them by supporting them with ongoing coaching, providing time to explore and plan lessons, helping them access and use school technology to practice learning following professional development, and sharing ideas for integrating new literacies directly into specific content and standards (Stolle, 2008; Hutchison, 2012).

The Collaborative Inquiry model (Ball & Cohen, 1999; Palmisano, 2013; Opfer &
Pedder, 2011) provides the structure CTs described as important in this new literacies project: planning, co-teaching, and reflecting. When CT and ST participate in this process with the support of a Coach, they move beyond the sometimes frightening feeling that “I only know what I know.” When it comes to integrating new technologies in the classroom, that alone attitude can be intimidating.

In the Triarchic Model of Teacher Preparation, fountains of teacher knowledge from CT, ST, and Coach combine in a transformative space where practitioner knowledge is merged with TPACK (Mishra & Koehler, 2006) knowledge from a university coach who can serve as the university supervisor, and the preservice teacher becomes a partner with new knowledge perhaps not represented by either the CT or Coach. This space can be less hierarchical so knowledge from all three partners is equally valued and communication happens in the context of a conversational relationship between equals (Zeichner, 2010). Through the dynamic process of Collaborative Inquiry this triad plans, acts, and reflects together as they integrate new literacies into student learning in meaningful TPACK ways. All three partners function as knowledgeable co-learners as they continue to grow through planned professional development with ongoing coaching where ST, CT, and Coach share resources and ideas while reflecting together.

This model supports the ever-changing nature of new literacies and the need to collaborate to know them and to know how to use them effectively in the classroom. It was surprising how many CTs in the study did not know about district resources, technology available at their school, or procedures for reserving and checking out technology. All participants commented on the importance of collaboration beyond the
dyad to the larger participant group for sharing information and ideas, once again echoing Leu’s call:

As networked information resources become more extensive and complexly structured, and as ICTs continue to change with some frequency, no one person can be expected to know everything there is to know about the technologies of literacy; these technologies will simply change too quickly and be too extensive to permit any single person to be literate in them all. Each of us, however, will know something useful to others. (Leu, 2002, p. 328)

**Planning.** To add a new literacies component to the student teaching experience CT, ST, and Coach need to plan for TPACK learning by adding technology knowledge to pedagogical content knowledge. Dyad 3 in the current study explained their belief that this planning must begin at the start of the experience with meaningful new literacies integration.

Sarah: We didn’t use it right away in the semester, so I feel if I would have started right away with it I would have included it, been able to include it more because I would feel more comfortable with it. I would have known that I have to take this home, I have to take a certain amount of time every night to see what I can do with it. So just starting out right away… It didn’t (take a lot of time). It took a little more time but I feel like I should have incorporated it into my planning more and found things to go along with it. And I feel like if I would have had it right away, like I was already used to doing what I was supposed to do. So then it was like, “Now I will bring this in.” (Sarah, Dyad 3 Exit Interview, 12-4-12)

Ms. Majeres: Like if we had started the year tweeting the learning targets and
hooking it (laptop or iPad) up to the projector and every single morning we did it, then it’s something we would just do. (Ms. Majeres, Dyad 3 Exit Interview, 12-4-12)

The student teaching semester is so busy that once dyads establish planning patterns it takes effort to change them to include the technology component, and many never do. Another ST expressed not understanding how to add the technology component to lessons that she needed to teach on a given day, reiterating the fact that the dyad only had one iPad to work with and intimating that she was still forming her digital repertoire:

I think I feel like I was always so rushed to think about what I could do next and how I could incorporate that technology, otherwise I feel like I would have been asking (the Coach) more questions. But we kind of planned ahead in a lot of different things and I should have just looked at my plan book to see how I could have incorporated it more, even though we only have one (iPad) and we don’t have a ton of technology access here (Sarah, Exit Interview, 12-4-12).

Though some CTs and STs described themselves as planners, others described themselves as doers. One non-planning ST, William, could have integrated technology more effectively if he would have pre-planned with CT. Emerging from the data is the need for joint planning prior to teaching TPACK lessons to allow for technology to be checked out and set up for meaningful lessons. Although some CTs noted their teaching experience allowed them to try things “on the fly,” when adding the technology component CTs became learners again and planning became critical. Even an experienced teacher like Ms. Langston expressed frustration at trying to plan the technology component along with content and pedagogy, not knowing where to even
note it in a traditional plan book. A new plan format is needed containing both print and
digital options to support dyads’ planning in new TPACK ways beginning as preservice
teachers, not only listing the app/website/technology but also listing the strategy for use
in meaningful ways:

I want to think about how I actually incorporate it (technology) into my lesson
planning. And not just writing down do Lexia, or do Symphony Math. Because I
really do think about the apps, do they fit in with what I’m doing? Who needs to
do that? So actually figuring out, like this week. So I thought about what you
(Coach) said. OK so I have it down the apps that I’m having them do, like
PowerPoint. But there’s no place really built into my lesson plan that actually
incorporates that and tells me how. I have to think, you have to do a lot of work
for it (Ms. Langston, Exit Interview, 12-6-12)...I think it was too because you
said our lesson plans should have technology... And that is not even easy. Even
though now they are now making everything so techy, our lesson plans don’t look
anything like that. (Ms. Langston, Dyad 2 Exit Interview, 12-6-12)

Teaching. The second component of the Triarchic Model of Teacher Preparation
to create and utilize teacher TPACK knowledge is teaching. While CTs often listed the
benefit of participating with a ST as having a co-teacher in the room, we are still
conceptualizing the full potential of a co-teacher for new literacies integration. I coded
dyads teaching in a variety of ways including: teaching whole class (n=19), each teaching
separate groups (n=17), and team-teaching together (n=12). (a) While one dyad partner
taught the whole class, the other researched apps on the iPad, worked with individual
students, or walked around the room to assist students as needed. (b) When teaching
separate groups CT and ST worked with different groups of students, sometimes in stations such as during reading. Ms. Stout shared a creative example of how she capitalized on small group time to develop children’s digital repertoires while her ST taught guided reading.

I did iPad mini training sessions with the students while my student teacher was teaching. I explained what apps they could use, when and how to use them. The kids loved this! (Ms. Stout, eMail, 9-23-13)

(c) Team-teaching took on a variety of dimensions, many involving the CT or ST assisting with technology while the other taught so both were in front of the room together. “When we first started using the document camera towards the beginning of the year she (CT) would put it up for me, and move the paper along as I read about it (Sarah, Exit Interview, 12-4-12). Dyad 4 continued the technology support role, this time the ST supporting the CT and “jumping in” to add ideas during teaching as well:

He (ST) did have to help me, especially at the beginning, to get stuff set up and make sure it was all ready and ready to go...He helped me get on and get my bearings. We didn’t like co-teach a specific lesson like when you came, but there were times when we would jump in and help each other out so that did help.

(Ms. Stout, Exit Interview, 12-3-12)

Ms. Lisko and Angeline took co-teaching to a new level as Angeline supported Ms. Lisko and the children in their technology use during the student technology project. Both CT and ST moved around the room assisting children to help them successfully create a multimedia presentation. Without the active role of both co-teachers this lesson probably could not work for young children.
Reflecting. The third element of collaborative inquiry operating in the Triarchic Model is reflecting when adding the technology component to create new lessons with increased complexity. These additions require continuous formative processing before, during and after teaching to evaluate effectiveness. Although least frequently noted of the collaborative inquiry components, both CTs and STs commented on the benefit of providing opportunities for reflection, a previous theme in this chapter. Reflection was the area where coaching became important. Dyads reflected together during coaching sessions as well as individually outside of the classroom, as they evaluated integration through reflective prompts in the online log. A ST summed it up well when she said, “So it set up opportunities for us to reflect and reassess” (Mikayla, Exit Interview, 12-7-12).

When trying new things such as new literacies integration reflecting is essential. These CTs and STs noted in weekly learning that, when using technology, things don’t always go as planned so you need a back-up plan. Websites go under construction, apps go down, children know more (or less) than expected, all situations requiring adjustment.

Summary. The Triarchic Model for Teacher Preparation incorporates a dynamic tension of collaborative inquiry as CT and ST supported by a coach who can function as a university supervisor plan, teach, and reflect to add the technology component to content and pedagogy. This process creates TPACK lessons that engage and challenge children. The goal is to support ST and CT in integrating new literacies to fully utilize the full potential of technologies and create value added lessons where children are empowered to choose, plan, collaborate and problem solve using new literacies. The Triarchic Model includes a new literacies integration emphasis and assists all partners in compiling a
digital repertoire of 21st century learning tools to incorporate into lessons. CTs function as knowledgeable co-learners and learn new literacies strategies along with STs. This model answers a call for innovative teacher education to integrate technology for preservice teachers in an effort to educate children in all schools for full participation in the 21st century (Wright & Wilson, 2005; Zeichner, 2010).

**Study Summary.**

This study illustrates ST/CT dyads’ experiences participating in a student teaching experience that emphasized new literacies integration with the support of a coach. Five collaborative approaches emerged providing starting options for ST/CT dyads integrating new literacies. Teacher resourcefulness led to paradigm shifts using technology as a learning tool rather than teaching tool across transitional weeks. Teachers designed new literacies experiences embedding technology skills, effective student use, and developmentally appropriate tasks. Dyads involved children in using new literacies focusing on ethical practice, on task behavior, and engagement. Results showed that both CTs and STs became learners when they focused on new literacies integration using Collaborative Inquiry and supported by focused coaching. Based upon these findings, a new Triarchic Model of Teacher Preparation emerged. A triad comprised of CT and ST assisted by a coach plan, teach, and reflect using collaborative inquiry to create learning experiences that embody meaningful technological pedagogical content knowledge.

**Limitations**

This qualitative collective case study provides an in-depth description of ST/CT dyads’ experiences integrating new literacies in elementary classrooms when assisted by a coach. The case was bounded by demographics and time so it cannot be exactly
duplicated. Some variation existed among ST participants with two masters students and three undergraduate students. While this situation provided insights into both designs in teacher preparation, it also created a discrepancy in the number of days ST spent in the classroom. The masters STs spent two days in the classroom while undergraduate STs spent all five days in the classroom, influencing the amount of time the ST and CT taught during this semester. In addition, although 89 online logs were submitted over the semester, 5 CT weekly logs and 7 ST weekly logs were not submitted despite email and verbal reminders. William quit submitting online logs after Week 6 so four of the missing ST logs belonged to him. Other participants forgot to submit once or twice during the study, mainly over breaks and the last week of the study. By triangulating other data sources I was able to complete the picture of the missing week. Additionally, all participants volunteered for the study indicating a high level of motivation to integrate new literacies. Implementing this program with all teachers in a school may produce varied results based upon teacher motivation and goals.

Finally, I served as principal researcher and technology coach for the dyads. This allowed me to function as a participant observer (Gold, 1958; Creswell, 2013) providing more contact hours with dyads to inform clearer interpretation of data. To eliminate possible bias, I used inter-rater reliability checks to clarify coding and have made every effort to consider possible bias in the data analysis process through member checks and peer review. In addition, I recruited and interviewed each CT and ST separately to reduce the power inherent in ST/CT relationships and give voice to each participant. Further implementation of the model should include a technology coach who is not also the researcher.
Study Significance

The literature shows that traditional professional development has not sufficiently focused on integrating technology into the curriculum while meeting teachers’ needs (Apple, 2004; Cuban, Kirkpatrick, & Peck, 2001; Mumtaz, 2000). In addition, teachers indicate a lack of ongoing support and collaboration to integrate technology into instruction following professional development (Brinkerhoff, 2006; Hutchison, 2012; Mouza, 2002, Mumtaz, 2000). While Brinkerhoff (2006) examined the effects of extended professional development on teachers’ technology self-efficacy and beliefs, this study added research on the processes CTs and STs used to integrate new literacies. As technologies rapidly emerge, articles about individual teacher use of technology for a specific project frequently emerge before empirical studies are conducted (Damico & Riddle, 2006; Bogard & McMackin, 2012; Kreul, 2005; November, 2011). This qualitative collective case study went beyond individual teacher uses of technology to examine in-depth the collaborative processes involved in creating TPACK lessons through new literacies integration by ST/CT dyads working with a coach in elementary classrooms. In addition, Don Leu (2000) encourages researchers to explore how to better support teachers to learn how to integrate new technologies into teaching. This study explored and supported that integration process for CTs and STs. This research adds a model of professional development with follow-up coaching in a collaborative process to support ST/CT dyads implementing professional development to increase children’s use of technology for learning.

Existing research focuses on the importance of collaboration generally in quality professional development (Guskey, 2003; Mumtaz, 2000) as well as specific student use
of technology to extend writing beyond the classroom (Burnett et al., 2006; Reich, Murnane, & Willett, 2012). While TPACK preservice teacher belief studies are increasing (Chai, Koh, & Tsai, 2010; Trainin, Friedrich, & Deng, 2013), few studies examine collaboration in technology professional development, an essential component noted by Mumtaz (2000). Building upon coaching literature (McKenna & Walpole, 2008; Scot, 2004; Cantrell & Hughes, 2008; Vogt & Shearer, 2011), this study adds to the sparse technology coaching research (Scot, 2004) while focusing on underrepresented elementary grades during the student teaching experience.

In addition, this research furthered previous studies examining technology integration with undergraduate and graduate students. Wilson and Friedrich (2012) used iPads with undergraduate and graduate teachers tutoring and coaching in a clinical setting. Trainin and Friedrich (2012) added a new literacies coach to assist undergraduate and graduate education students tutoring in a clinical setting through a “flipped classroom” approach to learning. Trainin, Friedrich, and Deng (2013) administered the TPACK Survey pre- and post-during the literacy methods block at two universities to evaluate preservice teachers’ perceptions of ability to integrate technology, while providing Technology Conferences to support new literacies integration. The current study furthered this research by: (a) supporting ST/CT dyads during student teaching as the participant unit, (b) coaching at elementary schools adding to the elementary school research, and (c) observing and interviewing to learn in-depth about new literacies integration from ST, CT, and dyad points of view.

Finally, this study adds to the student teaching research answering the call for innovative collaborative CT/ST formats (Kamens, 2007; Yopp & Guillame, 1999;
Overall findings gleaned from dyads include: (a) collaborative approaches support new literacies integration, (b) teacher and student growth and empowerment emerge through collaboration, (c) STs and CTs became learners working together with technology integration as added focus, and (d) the Triarchic Model of Teacher Preparation demonstrates collaborative inquiry for TPACK development.

Implications for Future Research

The need to prepare children to use new literacies continues to grow as technology standards are integrated into content standards (Common Core, 2010; ISTE, 2008). To meet these goals teachers are required to integrate 21st century skills effectively into the curriculum (NCTE, 2008; IRA, 2009; Partnership for 21st Century Skills, 2009). At the same time the digital divide continues to widen as more devices enter classrooms but few teachers use them consistently in student-centered ways (Gray, Thomas, & Lewis, 2010; Cuban, Kirkpatrick, & Peck, 2001). The need for ongoing professional development for teachers is evident. Additionally, we continue to search for effective teacher preparation models with a new literacies focus (Feiman-Nemser, 2012; Guiterrez, 2008; Zeichner, 2010). My study offers several potential needs for further research in these important areas.

The Triarchic Model of Teacher Preparation offers a new collaborative design for TPACK integration into innovative lesson design. This model needs to be studied more closely to look for further design suggestions. Do certain characteristics of CTs and STs make them more effective at integrating new literacies together? Should “planners” and “doers” be matched? And if so, how could accurate information on planning tendencies be gathered? How does technology ability of CT and ST affect outcomes? Can this model
be scaled to include more dyads? Does working and learning together more as equals affect the dyad’s new literacies integration? How could the university supervisor role be reimagined when implemented by the coach? And, are online collaborative groups as effective for new literacies integration, per the call from Lawless and Pellegrino (2007)?

Student technology projects arising from the added new literacies integration focus should be studied using the OPTIC rubric paired with technology/content standards rubrics. How do dyads incorporate desired design characteristics into student-centered learning projects? Does new literacies integration transform student learning in ways not possible without technology? Another area of potential challenge exists around teaching and observing student use of digital citizenship. With district restrictions in place determining navigable websites and safe-search lenses, how can we teach students to independently locate effective sites in an ethical manner? These are some areas for further research emanating from my study.

**Final Thoughts**

Teacher education needs to focus on providing preservice teachers with 21st century *learning* tools in addition to *teaching* tools. Teaching strategies perhaps need to focus on learner-centered strategies and technology-integrated strategies, valuing what the learner brings to any topic. Preservice teachers need to learn how to use a new technology personally and professionally, with a positive attitude toward facilitating this same learning in students while at the same time learning from them. If we want teachers to be learner-centered we as teacher education instructors need to model and invite input to develop skills of problem solving, planning, choice, and collaboration in preservice teachers.
Teacher education must offer new literacies integration through TPACK as an initial planning strategy and format for preservice teachers, facilitating the growth of teacher technology knowledge in addition to pedagogical content knowledge. We must emphasize ISTE and CCSS technology standards in conjunction with content area standards to inform lesson planning. Future teachers should experience 21st century skills of collaboration, communication, critical thinking, problem solving, innovation and global awareness in project-based formats so they grow as learners in today’s global world. We need to focus on the process of new literacies integration in addition to the products, and encourage multiple ways of responding to learning, as when Mikayla asked her professor if she could create a math screencast instead of writing a lesson plan. In teacher preparation we should provide digital options to preservice teachers encouraging multimedia use in planning, teaching, and reflecting. The Triarchic Model of Teacher Preparation provides structure for STs to experience a collaborative network, combining all areas of teacher knowledge in new ways to create TPACK learning experiences. Because CT modeling during student teaching influences the way a ST will teach and interact in their own classrooms (Anderson, 2007), providing experience via the Triarchic Model will prepare STs to collaborate with future colleagues for effective new literacies integration.
REFERENCES

DOI 10.1007/s11423-012-9239-4


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Appendix A

IRB Approved Consent Letter

College of Education and Human Sciences Department of Teaching, Learning, and Teacher Education

September 14, 2012

Thank you for considering to participate in technology integration coaching this semester, allowing us to work together to integrate new literacies in your classroom. Technology continues to expand its emphasis into all areas of life, requiring students and teachers to have effective technology skills. Education needs to anticipate and address the requirements placed upon students today by teaching meaningful integration of technology, yet many teachers feel unprepared to teach using technology. By sharing ideas and expertise we can impact the facilitation of new literacies in the classroom.

The study, Technology EDGE: A Partnership to Enhance Student Learning through Teacher Preparation and Professional Development, will take place from September through December in the 2012-2013 school year. We are asking you to: (1) participate in two 30 minute audiotaped interviews in a quiet location at your school where you can share some examples of how technology enables you to meet teaching goals, goals you have for integrating technology further, and ways I could assist; (2) complete a weekly online log noting ways you and your students used technology during the week and your goals for the coming week (5-10 minutes weekly) (3) allow four one-hour observations of you and/or your student teacher teaching using technology, providing a lesson plan with objectives for the lesson(s) being observed and reserving a few minutes following the lesson to discuss the lesson with the observer; and (4) select three or four student projects completed during the semester which integrated technology and evaluate it using a provided rubric according to the ISTE National Educational Technology Standards (NETS) for the same six students you predetermine including a boy and girl from high, middle, and low reading groups, and provide nameless samples (1 hour to score the six students’ projects once; this is done 3 or 4 times throughout the semester).

There are no known risks or discomforts associated with this research. All information obtained during this study which could identify you will be kept strictly confidential. The information obtained in this study may be published in scientific journals or presented at scientific/academic meetings, but the data will not identify you specifically.

Benefits of participating in the study include the opportunity to grow as a teacher using technology, through coaching on ideas for integrating new literacies to help meet your content standards. Feedback and discussion of lessons will provide additional strategies for integrating technology in supplemental lessons. This collaboration will provide the ongoing support to allow you to implement the technology uses for teaching and learning presented at the Tech EDGE.
Conference. Note that you are able to attend the conference but choose not to participate in the study.

You may ask any questions concerning this research and have those questions answered before agreeing to participate in the study. Or you may call the investigators at any time. If you have any questions concerning your rights as a research subject that have not been answered by the principal investigator or to report any concerns about the study, you may contact the University of Nebraska – Lincoln Institutional Review Board, telephone (402) 472-6965.

You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the investigators, the school district, or the University of Nebraska-Lincoln. Your decision will not result in any loss or benefits to which you are otherwise entitled.

You are voluntarily making the decision whether or not to participate in this research study. Your signature on the form certifies that you have decided to participate, having read and understood the information presented in this letter. A copy of this letter is included to keep for your files.

___ I agree to be audiotaped

_______________________________________ Printed/Typed Name of Participant

_______________________ ____________ School grade taught

_______________________ Phone _________________ email address

______________________________________Signature of Participant

Thank you!

Laurie Friedrich  Graduate Assistant  University Of Nebraska, Lincoln Phone: 402/641-5967  Email address: Laurie.Friedrich@cune.edu

Dr. Kathleen Wilson  Associate Professor/Graduate Chair Teaching, Learning, and Teacher Education University of Nebraska, Lincoln
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Appendix B

Student Teacher/Cooperating Teacher Technology Use Online Log

1. New literacies online skills include: identifying important questions, locating information, evaluating information, synthesizing information, and communicating findings (Leu, 2010).
   Did you integrate new literacies in your teaching this week?  (Yes  No)

2. In how many lessons did you integrate technology in your teaching this week?  (slide 0 - 15+)

3. How many hours did you integrate technology into your teaching this week? (slide 0 - 12+)

4. In which subjects did you integrate technology?  (check all that apply)
   Social Studies      Science       Reading       Writing       Math       Arts
   Computer

5. Describe the best example of how YOU used technology in your TEACHING this week.

6. Describe the best example of how your STUDENTS used technology in LEARNING this week.

7. What apps, websites, or technologies did you use this week?

8. With whom did you collaborate: (check all that apply)

<table>
<thead>
<tr>
<th>Collaboration Partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>another teacher in your school</td>
</tr>
<tr>
<td>cooperating teacher /student teacher</td>
</tr>
<tr>
<td>coach</td>
</tr>
<tr>
<td>online community</td>
</tr>
<tr>
<td>I did not collaborate with anyone</td>
</tr>
</tbody>
</table>

9. How did you collaborate?

10. How many hours did you spend learning technologies to prepare to teach lessons integrating technology? (slide 0 – 10)

11. What goal do you set for new literacies integration in your subjects next week?

12. How could I best support you?
Appendix C

Technology Workshop Schedule
November 2, 2012, 11:45am-3:00pm

Sectional 1
1. Lunch, Technology Survey, & Introductions (name, school, grade, dyad partner, one technology idea you are trying)

2. Create an eBook using iBooks Author & create graphs using Google Docs Spreadsheet (insert chart)

3. Technology troubleshooting & answers to app/technology requests

4. Student Technology Project Rubrics- learning how to score for the standards

5. Break

Sectional 2
6. Dyad Technology use share!!! (4 minutes for each dyad to share a technology idea they have used in their classroom)

7. Introduction to Edmodo

8. New Literacies discussion

9. Demonstration of new apps & iTunes gift card

10. Coaching comments & closing

<table>
<thead>
<tr>
<th>Cooperating Teachers</th>
<th>Student Teachers</th>
<th>School</th>
<th>Grade</th>
<th>Meeting Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr. Wichert</td>
<td>Mikayla</td>
<td>Bakewell</td>
<td>4</td>
<td>Thursday 9:15am</td>
</tr>
<tr>
<td>Ms. Langston</td>
<td>Lauren</td>
<td>Bakewell</td>
<td>3</td>
<td>Thursday 3:00pm</td>
</tr>
<tr>
<td>Ms. Majeres</td>
<td>Sarah</td>
<td>Carson</td>
<td>2</td>
<td>Wednesday 8:15am</td>
</tr>
<tr>
<td>Ms. Stout</td>
<td>William</td>
<td>Fenton</td>
<td>2</td>
<td>Wednesday 1:05pm</td>
</tr>
<tr>
<td>Ms. Lisko</td>
<td>Angeline</td>
<td>Arlington</td>
<td>K</td>
<td>Thursday 1:05pm</td>
</tr>
</tbody>
</table>
Appendix D

Beginning Interview Protocol

1. Tell me about yourself as a teacher.

   Follow up probes: What are your greatest strengths as a teacher?

   What are your greatest areas of need as a teacher?

2. How do you believe students learn best?

3. How do you define new literacies?

4. What are your goals for technology integration?

5. Tell me about your best experiences using technology in teaching?

6. Tell me about one meaningful way you had students use technology?

7. How could I best help you integrate technology in your classroom?

8. How do you envision working together (as student teacher/cooperating teacher) to integrate new literacies into your teaching?

9. What questions would you like answered regarding new literacies and technology integration?
Appendix E

Exit Interview Protocol

1. What were the highlights of your semester together as student teacher/cooperating teacher?
2. Tell me about how you worked together to integrate new literacies into your teaching.
3. What role did each of you take in integrating technology?
4. Tell me about the role collaboration played in your new literacies integration.

Probe: How did coaching impact your new literacies integration? Online peer sharing?

5. What are some of the student technology projects you thought best exemplified your goals of new literacies integration.
6. How do you believe students learn best?
7. How do you define new literacies?
8. What goals do you have for integrating new literacies in your teaching next semester/year?
9. How did new literacies integration influence your student teacher/cooperating teacher collaboration?

10. What else would you like me to know about your experience as a student teacher/cooperating teacher team using technology?
Appendix F

Dyad Exit Interview Protocol

1. What was most helpful thing about having a partner as you integrate new literacies?

   Probe: How can a dyad best work together to use technology?

2. What did you do that you think helped students learn the most?

3. What technologies did you find to be most helpful in teaching?

   What technologies do you think are the most effective to use with students for student learning?

4. How do you think the added focus on technology influenced you as a ST/CT dyad?

   Probe: Did you see boundaries/leadership change at all?

5. What suggestion would you give to an incoming ST/CT dyad to make their new literacies integration beneficial for teachers and students?
Appendix G

Observation Protocol

School ________________________________  Grade ____________

Teacher ________________________________  Student Teacher

Date __________________              Observation number ____

Sketch of classroom:

Subject observed:

Lesson plan objectives for the lesson (content & technology):

New literacies skills taught:

Technology utilized:

Teacher Pedagogy:

Student use of new literacies:

Outline of lesson:

Purposes for technology integration:
    (1) technology for technology’s sake  (2) replacement for traditional method  (3) innovation

Quotes:

Unexpected findings:

Suggestions for further technology integration:
Appendix H

Observation Protocol for Technology Integration in the Classroom (OPTIC)

**II. Integration Observation Rubric:** For each row, place a mark in the bracket in the box best representing the situation you observe. Columns 4 and 2 are provided as intermediate points for your convenience. A mark in column N/A means the item is not applicable in this situation. Use of N/A in any one observation is not a sign of deficiency.

<table>
<thead>
<tr>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>N/A</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most students are independently choosing the technologies appropriate to their learning objectives.</td>
<td>[ ]</td>
<td>Some students are independently choosing the technologies appropriate to their learning objectives.</td>
<td>[ ]</td>
<td>Students are using only the technologies prescribed by the teacher for meeting learning objectives.</td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>Students are highly involved with their teacher and peers in planning for the use of technology in a unit or lesson.</td>
<td>[ ]</td>
<td>Students have a moderate role with their teacher and/or peers in planning for the use of technology in a unit or lesson.</td>
<td>[ ]</td>
<td>Students await and follow teacher directions for what technology to use.</td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>In group activities using technology, a high degree of collaboration is exhibited.</td>
<td>[ ]</td>
<td>In group activities using technology, a moderate degree of collaboration is exhibited.</td>
<td>[ ]</td>
<td>In group activities using technology, few students display collaboration.</td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>When using technology, most students act ethically and in accordance with the district acceptable use policy.</td>
<td>[ ]</td>
<td>When using technology, some students are not acting in accordance with the district acceptable use policy.</td>
<td>[ ]</td>
<td>When using technology, few students follow the district acceptable use policy; many violations are apparent.</td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>Most students exhibit skill in the effective use of available technologies at or above grade and ability levels.</td>
<td>[ ]</td>
<td>Some students exhibit skill in the effective use of available technologies at or above grade and ability levels.</td>
<td>[ ]</td>
<td>Students generally exhibit a low level of skill in their use of available technologies and require much assistance.</td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>In using technology, most students are focused on the intended curricular objectives.</td>
<td>[ ]</td>
<td>In using technology, some students are focused on the intended curricular objectives.</td>
<td>[ ]</td>
<td>In using technology, few students are focused on the intended curricular objectives.</td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>Most specific technology skills are embedded and learned in the context of core curriculum lesson objectives.</td>
<td>[ ]</td>
<td>Some specific technology skills are practiced in the process of achieving core curriculum objectives.</td>
<td>[ ]</td>
<td>Specific technology skills are taught and practiced as separate lessons, and later applied to core objectives.</td>
<td>[ ]</td>
<td></td>
</tr>
</tbody>
</table>
| **Problem solving**  
**and higher order thinking** is evident in most students’ activities. | [ ] | Problem solving and higher order thinking is evident in about half the class. | [ ] | Most students exhibit little creativity, only responding to software prompts. | [ ] |
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Most students <strong>are highly engaged</strong> in the use of technology.</td>
<td>[ ]</td>
<td>Some students are highly engaged in the use of technology and others are not.</td>
<td>[ ]</td>
<td>Few students are highly engaged in the technology activity.</td>
<td>[ ]</td>
</tr>
<tr>
<td><strong>Student use of technology is based on their cognitive abilities and physical needs.</strong></td>
<td>[ ]</td>
<td>Student use of technology is directed at one of the needs areas.</td>
<td>[ ]</td>
<td>Student use of technology is directed at neither area.</td>
<td>[ ]</td>
</tr>
<tr>
<td>Most technology uses represent learning activities that could not otherwise be easily done.</td>
<td>[ ]</td>
<td>Some technology uses support learning activities that could not be done without it.</td>
<td>[ ]</td>
<td>Most of the learning activities might be done as well or better without technology.</td>
<td>[ ]</td>
</tr>
</tbody>
</table>
Appendix I

Technology Rating

Please rate yourself on the following areas regarding technology by circling the number that best defines your stance:

1. Ability to use technology personally.  
   - Novice
   - Competent
   - Expert
   1 2 3 4 5

2. Ability to use technology in teaching.  
   - Novice
   - Competent
   - Expert
   1 2 3 4 5

3. Interest in using technology in teaching.  
   - Low
   - Medium
   - High
   1 2 3 4 5

4. Interest in seeking out opportunities to learn more about technology integration.  
   - Low
   - Medium
   - High
   1 2 3 4 5

5. Please circle all professional development opportunities you have attended in the last three years regarding technology in teaching:
   A. University Technology Conference
   B. ETA Conference
   C. District professional development (topic ____________________________)
   D. School professional development (topic ____________________________)
   E. Other flex time ____________________________
   F. Workshop ____________________________
   G. Other conference ____________________________
   H. Other ____________________________

6. Topic you would find helpful at a Technology Conference ____________________________

7. Topic you could present at a Technology Conference ____________________________
Appendix J

Professional Development Enacted by Dyads

<table>
<thead>
<tr>
<th>Professional Development</th>
<th>Dyad 1</th>
<th>Dyad 2</th>
<th>Dyad 3</th>
<th>Dyad 4</th>
<th>Dyad 5</th>
</tr>
</thead>
</table>
| **Technology Conference 9-10-2012** | *Educreations*  
*Twitter*  
*“Flipped Classroom”* | *Educreations*  
*Google Earth*  
*Running Records goes Digital* | *Educreations*  
*Tech in Formative Assessment*  
*Educreations*  
*Twitter* | *eBook Magic*  
*RRCalc* | *eBook Magic*  
*Educreations*  
*Tech in Formative Assessment* |
| **Coaching** | *Storybird*  
*Comic Touch*  
*Research*  
*AudioNote*  
*Dragon Dictation*  
*Spelling City*  
*Socratic* | *Puppet Pals*  
*Spelling City*  
*Word Zombies*  
*Big Cat*  
*Citing sources*  
*Storybird* | *Total Recall*  
*iCard Sort*  
*Spelling Magic*  
*Build-a-Word Express*  
*ABC Tracer*  
*Pebble Go*  
*Amazing Animals* | *Dragon Dictation*  
*Notes*  
*Math Challenge 1 Lite*  
*Jeopardy*  
*Educreations*  
*BBC Words & Pictures*  
*iCard Sort* | *eBook Magic*  
*Build a Word*  
*iCard Sort*  
*Alpha Cards Combo Pack*  
*Tumble Books* |
| **Workshop 11-2-2012** | *Edmodo*  
*Twitter to send class objectives home* | *Edmodo*  
*YouTube*  
*Apple Account* | *Word Dynamo*  
*Flipping the Classroom* | *Edmodo* | *YouTube to introduce lesson*  
*Socratic* |
| **Presented at Technology Conference 1-28-2013** | (1) “Flipping the Classroom”  
Educreations Twitter (Dyad)  
## Appendix K

### Dyad Observations by SAMR Level

<table>
<thead>
<tr>
<th>Dyad</th>
<th>Teacher-Centered Lesson Enhancement</th>
<th>Student-Centered Lesson Transformation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>SAMR-Substitution</strong></td>
<td><strong>SAMR-Augmentation</strong></td>
</tr>
<tr>
<td>1 Obs.1 Grade 4</td>
<td>Online Reading Series: Students come up to iPad &amp; write on graphic organizer</td>
<td></td>
</tr>
<tr>
<td>1 Obs.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Obs.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Obs.4</td>
<td>Students take Spelling test at Spelling City</td>
<td></td>
</tr>
<tr>
<td>2 Obs.1 Grade 3</td>
<td>Students create PowerPoint, Puppet Pal video, Educreations screencast &amp; share in class</td>
<td></td>
</tr>
<tr>
<td>2 Obs.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Obs.3</td>
<td>Students use laptops to go to Brain Pop, Symphony Math, log in, off</td>
<td></td>
</tr>
<tr>
<td>2 Obs.4</td>
<td>Students take Spelling test at Spelling City</td>
<td></td>
</tr>
<tr>
<td>3 Obs.1 Grade 2</td>
<td>Individual students practice skills on iPad with teacher</td>
<td></td>
</tr>
<tr>
<td>3 Obs.2</td>
<td>Individual students practice spelling in a screencast and read online digital book with teacher</td>
<td></td>
</tr>
<tr>
<td>3 Obs.3</td>
<td>Teacher creates graphic organizer to review content, students tell what to write on the line</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Obs.4</td>
<td>Students come to front of room and sort cards on iPad</td>
</tr>
<tr>
<td>----</td>
<td>------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>Dyad</td>
<td>SAMR-Substitution</td>
<td>SAMR-Augmentation</td>
</tr>
<tr>
<td>4</td>
<td>Obs.1</td>
<td>Student reads story in Dragon Dictation, edits text in Notes supervised by teacher</td>
</tr>
<tr>
<td>4</td>
<td>Obs.2</td>
<td>Student listens to word on iPad then types to spell</td>
</tr>
<tr>
<td>4</td>
<td>Obs.3</td>
<td>Students use iPad to read in Dragon Dictation, edit in Notes, cut and paste pictures, publish in eBook Magic</td>
</tr>
<tr>
<td>4</td>
<td>Obs.4</td>
<td>Teacher shows digital citizenship poster online and engages students in discussion</td>
</tr>
<tr>
<td>Dyad</td>
<td>SAMR-Substitution</td>
<td>SAMR-Augmentation</td>
</tr>
<tr>
<td>5</td>
<td>Obs.1</td>
<td>Students log in, locate websites, search images on laptops</td>
</tr>
<tr>
<td>5</td>
<td>Obs.2</td>
<td>Students log in, locate websites, search images, cut and paste on laptops</td>
</tr>
<tr>
<td>5</td>
<td>Obs.3</td>
<td>Students log in, open two tabs, search, cut and paste in PowerPoint, save on laptops</td>
</tr>
<tr>
<td>5</td>
<td>Obs.4</td>
<td>Teacher showed webcast from District site about fire safety</td>
</tr>
</tbody>
</table>
Appendix L

Addendum

To close I would like to update you on each of the participants since the study ended: what they are doing, how they integrate new literacies, if they continued seeking professional development, and any transfer of learning to others.

Mr. Wichert assumed a new position as computer specialist in the same school district, after concluding the school year during which he participated in this study while teaching fourth grade. He believes in student-centered technology integration and wanted the opportunity to work with children and teachers alike to get students thinking critically using technology. He regularly attends and presents at technology conferences, including presenting at five University Technology Conferences as well as the Nebraska Educational Technology Conference (NETA), and is completing his second Masters degree. He transformed how his school teaches computer moving from keyboarding to Minecraft. He is currently collaborating with other computer teachers to have students build an exact replica of the State Capitol in Minecraft from actual blueprints.

Mikayla completed her year of student teaching in the Masters+ program, and this year completed her first year teaching fourth grade at another school in the same school district. Although she was less confident using technology when she began the study, now she reports using: the new district online Reading program, Google Docs for student biography reports, Math apps, Jeopardy Review Games, Grammar Monsters as a teaching tool for various state testing on related parts of speech, and showing commercials prior to teaching Persuasive Essay. Following what Mr. Wichert modeled for her in another 4th grade classroom where testing is heavy, Mikayla arranged her schedule so “Each student received 10 minutes per week of free time on the iPad (using pre-approved educational and art apps).” She attended and presented at one University Technology Conference, and attended District professional development on the digital classroom. One exciting fact Mikayla shared: “(My school) is getting iPads with projectors for all teachers next year! I hope to vastly increase my use of technology in teaching!”
Ms. Langston continued to teach third grade at the same Title I school she was at during the study. She has her students writing scripts and creating movies using the iPad. The principal again asked them to show their movie to the whole school and explain how they made it, as she had with the Puppet Pals videos they created during the study. She worked with another student teacher this year and continues to attend as many technology conferences as she can. She presented at three University Technology Conferences, and was accepted to present at a field experience conference in Colorado. Ms. Langston appreciated the coaching from the study and how much she has grown in using technology, exclaiming, “You made us feel like we could do anything!”

Lauren completed the year of student teaching third grade in the Masters+ program, and this year taught her own second grade class in the same school district. She reports using the Document Camera and projector multiple times per day, the technology item she initially had trouble connecting and later classified as her favorite teaching device during the study. She allows students to watch YouTube videos at a computer website as a reward. Lauren has used many online features of the new District Reading program. She attended two University Technology Conferences, presenting at one of them. In addition, Lauren attended a District topic on How to Use Laptops. Lauren expressed concern about access to technology at her school that discourages use, “I do not have access to any other technology on an easy basis (laptop cart is available to second grade, but there are 5 second grade classrooms, and the cart is on another level of the school quite a ways from my classroom).”

Ms. Majeres remained in her second grade teaching position at the same school. The best way she used technology was using the District’s new Reading series website to plan lessons and to teach and review skills incorporating new online components. She worked with an additional student teacher, noting that that student teacher was initially uncomfortable using technology but grew with support. “Yes. She was very hesitant about using technology. We had to work through the kinks of what was available technology wise and also how to use it during a lesson. By the end of her student teaching
I would say she felt much more comfortable using technology.” Ms. Majeres attended one University Technology Conference in person and two online, but has not presented. She shared how her increased TPACK knowledge impacts her planning and teaching, “I have tried to use some type of technology each day in my classroom. I also feel like I have thought differently about using technology. Instead of it being an after thought, it is one of the first things that comes to my mind when I am planning lessons.”

Sarah graduated following student teaching and decided to go to Europe to nanny for a year, working for parents of a student she taught during student teaching. After returning from Europe, Sarah served as a para-educator and kindergarten media specialist in the school district in which she student taught. Sarah notes her best technology uses this year as using laptops and iPads with students. She attended the whole school professional development on new literacies integration that we presented this past year. She is now applying for a full time teaching position.

Ms. Stout still teaches second grade at her same school. She continues to be resourceful finding technology for her students. “I have received two iPads with two separate grants! I think I will write another one this summer and see if I can land one more! I had five total including mine, and your two from the University. The kids love having them in the classroom!” Ms. Stout continues to implement the Language Arts Tech Tuesdays she began during the study, planning technology Word Work for all second grades in the computer lab. She was most proud of her new idea for Sunday Parent Online Newsletters that have been very well received. She projecting her iPad during lessons daily in the District reading curriculum, Math, Guided Reading, Integrated Studies, Google research questions, Kagen activities, YouTube, and she uses Educreations as a whiteboard tool almost everyday! When Ms. Stout purchased her iPad during the study and had to troubleshoot projecting, she wanted to use Educreations for Math so it is encouraging to see that she can now project and add student screencasting to math per her goals from the study. She worked with two student teachers since this study, and attended and presented at six University Technology Conferences, one of them presenting online via Skype. In addition, she attended two ASCD conferences, presented
at one NETA conference, and attended a District sectional on Edmodo. “I have also trained others in my school on how to integrate technology in the class, which is fun to share what I love with others. I also shared an iPad with the Kindergarten class daily during our specials time:).” And Ms. Stout just sent another excited email: “I wrote a proposal to present at the ASCD conference next March in Houston with the Whole Child Network group! (My principal) thought I should submit to teach an iPad session! I will find out soon if it was accepted or not. I will let you know what I hear.” The relationship built during and following the study with participants continues to connect the group, and we share resources and celebrate with each other!

William did not end up going into teaching but did present at one University Technology Conference. “I actually continued back at UNL last Spring where I just obtained my Agricultural Economics degree this May. I will be moving out to North Platte in the upcoming months to where I will be working as a company’s newest farm manager. While I was student teaching though, I was very pleased with having the opportunity to work with you and learning new concepts of integrating technology into the classroom! Although I may not be teaching today I did pass on my knowledge of what I’ve learned to my mother, father, and sister. The following survey is actually my Mother’s experience of integrating technology in her (K-4) special education classroom, of which I gave her many ideas.” William interviewed his mom and shared that she uses iPads with students for almost everything including math and spelling. When asked about working with his own student teacher, William responded, “I have not had the opportunity to, but my mother has and she always shows them the importance of integrating technology into their classrooms!” William said he is most proud of “the fact that I can pass my knowledge on to others (i.e. my mother, father, and sister.) This then allows them to pass ideas on to other teachers!...As the years progress technology will only become more important to a child's learning and for teachers to be more aware of this and to start integrating technology now into their classrooms. It facilitates a child's learning more and is an important piece to bettering our school systems!”
Ms. Lisko continues to teach Kindergarten at the same school. She describes how her students have actively used the iPad as part of instruction and games to support the curriculum. They did research using laptops on Pebblego.com as well as using Lexia Learning during workstation times. “I feel most proud of my flexibility and trust in my students to let them get their hands on the iPad and use it.” Ms. Lisko had a student teacher in the spring semester for 6 weeks. “We did not work together to integrate technology because she wasn’t there very long and she was not interested in learning much from me!” Time and interest in new literacies integration are important. While Ms. Lisko now plans lessons using the TPACK model, this student teacher did not. Ms. Lisko presented at one University Technology Conference. When asked what she was most excited about, Ms. Lisko shared, “I got an iPad mini in April and began using several apps for instruction and management including some of the following: Nearpod, Educreations, Showme, Stage, Class dojo, Too Noisy, District Reading program games, Giant timer, & What Time is it Mr. Wolf?” Ms. Lisko now rates herself 5 on a scale of 1-5 in all areas: personal use of technology, teaching use of technology, and interest in learning about technology in teaching.

After graduation Angeline was accepted into Teach for America teaching 1st grade in a Kansas City school with eighty-nine percent minority population. She describes availability and use of technology there: “In the classroom we had six laptops available. The laptops served as a center during Math and Reading centers… to further their Math/Reading skills. In the classroom, I also have an Eno board (Smartboard). This was used for whole group teaching. Students were able to use the Eno pen to show their learning… some of my students became more capable with computer shortcuts and how to use search engines because I took the time for them to learn these skills.” Angeline was excited about the upcoming year, “when Kansas City Public Schools will be doing a 1:1 initiative where every student will have his/her own laptop. I will also be teaching third grade instead of first grade. Given that each student will have his/her own computer I plan on adding more computer-based projects. (Ex. Students doing PowerPoints, Prezis, etc. on what they learned in a unit)...For the 2014-2015 school year, I also plan on using my iPad Air as one of many intervention strategies with the students.” Both ST and CT in
Dyad 5 purchased iPads since the study! Angeline presented at two University Technology Conferences and attended two school professional development topics on (a) Pearson: SuccessNet Training and (b) NWEA Training. Angeline continues to rate her interest in technology as 5 on a scale of 1-5.