ABSTRACT

JETT, JANICE ROWE. Passage from Pen and Paper to Keyboard and Screen: An Investigation of the Evolution of Writing Instruction in One-to-One Laptop Settings. (Under the direction of Dr. Carol A. Pope.)

With the steady increase of ubiquitous computing initiatives across the country in the last decade, there is a pressing need for specific research looking at content area instruction in 1:1 settings. This qualitative multiple case study examines writing instruction at two middle schools as it is delivered by experienced teachers in five English language arts classrooms in 1:1 settings. The driving inquiry behind the study reads, "How are teachers' pedagogical strategies for teaching writing influenced by their students' 1:1 laptop access?" Detailed teacher interviews, classroom observations, student interviews and focus group discussions, and lesson plans comprise the sources of data for the study. Themes emerging from the data include the struggle of distractions in many 1:1 English language arts settings, an evolving balance between paper-based and laptop-enabled writing activities, and the not-so-subtle influence of teachers' values on the types of writing activities assigned. Discussion centers on student and teacher challenges in the 1:1 setting, changes in writing activities taking place and the use of time for the writing process, and the influence of these factors on teachers' pedagogical strategies for teaching writing as a result. Findings indicate that teacher participants value ubiquitous computing access for their students, though there is considerable variety in the way in which writing instruction is implemented. Reasons for this variation include personal teacher values concerning pedagogy, content, and technology, variations in teacher perception of a need for balance between paper-based and online writing activities, and the types of access students have to their laptops. Implications for English language arts instruction are provided as are suggestions for future research.

Passage from Pen and Paper to Keyboard and Screen: An Investigation of the Evolution of Writing Instruction in One-to-One Laptop Settings

by
Janice Rowe Jett

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APPROVED BY:

Dr. Carol A. Pope Committee Chair	Dr. Lance D. Fusarelli
Dr. Meghan Manfra	Dr. Kevin Oliver

DEDICATION

For my understanding husband Mike, my beloved children Zachary and Julia, and my supportive parents Mary, Dee, and JB. Thank you for your love and the many sacrifices you made so that I could reach this milestone. My prayer is that I may have a role in helping you realize your hopes and dreams, too.

For my third grade teacher Ms. Georgia Abeyounis, who saw something in me that I did not realize was there and subsequently inspired a passion for learning that continues to this day.

For Meg, who loved teaching and learning, and for those like her whose lives halt just shy of fulfilling all they were capable of achieving.

BIOGRAPHY

Janice Rowe Jett has called the Triangle area home for the last decade, though she is originally from New Bern, NC. Upon being awarded a North Carolina Teaching Fellows scholarship, she attended the University of North Carolina at Greensboro and the University of Plymouth in England before earning her Bachelor of Arts degree in English Education in 1996. After an exciting first year of teaching middle school language arts in Durham, Janice married her best friend Michael and embarked on a newlywed adventure to Mobile, Alabama, where she taught high school English and was nearly roped into coaching softball and cheerleading (neither of which she knew anything about) before returning to Eastern North Carolina to teach at her alma mater, West Craven High School.

Janice spent the next four years teaching high school English and advising yearbook among other enjoyable activities – including earning a Master of Arts degree in 2000 at East Carolina University – before being blessed with a son named Zachary in 2002. For a time, she taught writing classes at the community college level part-time while staying home with her son. A downturn in the economy impacted her family's finances, thus leading her to return to school for a second Master's degree in School Administration as part of the Principal Fellows Program at East Carolina University.

After a stimulating year of classes, Janice began her administrative internship with Johnston County Schools at Selma Elementary. She soon discovered one of the best-kept secrets in the county with 900+ loving children and a devoted faculty and staff. Blessed with a beautiful daughter in 2005, she remained at Selma for six years, serving as principal

beginning in 2008. In January of 2009, she answered the call to begin doctoral studies in curriculum and instruction at NC State.

Janice soon realized that balancing her administrative responsibilities, a young family, and her studies was becoming increasingly demanding, so she made the difficult decision to part from her Selma family in 2010. A few months later, she embarked on a new adventure teaching middle grades language arts at Cathedral School in downtown Raleigh. She thoroughly enjoys teaching and learning with her Cathedral family as well as the future teachers she has had the privilege to guide at NC State in *Middle Years Reading* classes. Though she cannot immediately discern what is ahead for her upon completion of her studies, Janice firmly believes that God has something in mind that is "the perfect fit." Now is the time, then, to enjoy the journey!

ACKNOWLEDGEMENTS

"Let us persevere in running the race that lies before us while keeping our eyes fixed on Jesus." – Hebrews 12:1-2

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what it means to be student-centered at the collegiate level, and I am truly grateful. Please know that you have influenced far more students than you likely know. Thank you for being a role model, and more importantly, a true friend. It was God's plan that our paths should converge; I look forward to the time when they will come together again. In the meantime, please know that I will be doing my best to guide and care for my students as you would.

In closing, I would like to thank my family, friends, and Cathedral colleagues who have at one time or another listened to any semi-interesting details of my work and been polite as I prattled on. Thank you for your support and any sacrifices you made so that I could complete this task. My prayer is that you, too, will realize any goals you have set for yourself. May God bless you along the journey!

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> High School Graduation Day. Surrounded by family, a young woman opens the flat package from her father to find a copy of Dr. Seuss's **Oh, The Places You'll Go.** It's a thoughtful gift, popular even for seniors preparing for a new chapter in life. But this particular book is different. "Take a look inside," her father suggests, his eyes twinkling. The girl opens the book and thumbs through the first pages. Soon she realizes each page is autographed by teachers, coaches, and administrators throughout her 13 years of school. Her eyes fill with tears as the words spark memories of beloved teachers and coaches of years past.
>
> Heart swelling with emotion, her father is overjoyed as he watches his daughter read over the various inscriptions, savoring the fruit of his labor of love. "It's amazing," his daughter manages, tears streaming down her face as she hugs her father tightly. Family members crowd in to see the book.
> A few hours later, the young woman logs on to her blog and gushes about the wonderful gift she has received. In a matter of days, her page has received 20 million visits. Within a week, NBC's **The Today Show** calls with an invitation for the young woman and her parents to appear on national television. Stunned, the family accepts the offer and begins to plan for the trip. Her blog now has close to 24 million hits, and counting…

This account illustrates the power of the written word amplified by technology to change lives. With her autographed copy of *Oh, The Places You'll Go,* the young woman has a treasured keepsake filled with heartfelt messages that she will hold near and dear for a lifetime. By sharing details of her gift in a blog online, nearly 24 million people have become familiar with the touching story, with perhaps millions more viewers having subsequently seen her on *The Today Show*. The young woman and her family – once small-town North Carolina people – are now celebrities, even if only for a short while. The initial act of writing and then sharing through technology seemed commonplace enough. Yet the combination proved potent in ways that no one likely could have foreseen.

Background

If technology is merely a buzz word in education, as some critics have suggested, it has certainly outlived the traditional tenure for fads. With the arrival of the personal computer in schools in the mid-1980's, technology has impacted the way we do business at every level of schooling for over 25 years. Methods of research, recording, and reporting information have all evolved, and there seems to be no immediate end to the possibilities available to students and their teachers for enhancing learning through the use of the Internet and computers. Of course, familiarity naturally varies between learners and the learned, particularly when generational experiences are considered.

Marc Prensky aptly labeled this distinction in a 2001 article *Digital Natives, Digital Immigrants*. Referring to those born in the late 1970's and beyond as "digital natives" and the more seasoned among us as "immigrants" is certainly reasonable, though troubling in the education realm because it implies that many teachers are responsible for educating students on subjects that are more familiar to those learning than those who are providing instruction. Nonetheless, many digital immigrant educators see the potential and value of technology in the classroom and are hard at work to bridge the learning gap.

One such technology initiative gaining considerable attention in recent years is the 1:1 laptop computer program in which all students in a class, at a school site, or within an entire school system receive individual laptops for daily instruction and often, though not always, home use. These programs are made possible by grants, through federal funding, with private or business donations, or sometimes via community support activities. Still other schools sacrifice print media purchases to afford the technology. Regardless of the

funding sources, 1:1 laptop programs are generally well-received because every student has portable access to the Internet, word processing, spreadsheet capabilities, and a variety of communication methods. Teachers and researchers alike (Holcomb, 2009; Penuel, 2006; Russell, et al., 2004) often report that student motivation and engagement are enhanced, and the quality of school work is improved in conjunction with 1:1 programs. Perhaps of greater gravity, school systems across the country are seeing improvement in student achievement measures (Holcomb, 2009). The potential for 1:1 laptop learning to enhance and enrich student learning is therefore clearly advantageous.

School leaders are taking notice of 1:1 potential as well. A 2010 poll of over 300 superintendents and school administrators from systems exceeding 2,500 students revealed that 63% of them believed that 1:1 classrooms featuring teachers as coaches for the students define education's future (Noonoo, 2011). In fact, many districts already have such programs underway. A 2010 survey by Nagel indicated that nearly 40 percent of school systems across the country have implemented some means of 1:1 computer access for students in their communities.

In North Carolina, nearly 50 school districts have some form of 1:1 program in place or are in the planning phase. Over 70 schools are currently engaged in 1:1 instruction, and preliminary studies (Argueta, et al., 2011) indicate noteworthy increases in student engagement, student achievement, and graduation rates for participating schools. Two districts in particular, the Mooresville Graded School District just outside of Charlotte and Greene County in the eastern part of the state, have received national attention in recent years for the success of their laptop programs.

Considering that preliminary research on academic achievement among the early adopters (Corn, 2009; Penuel, 2006; Silvernail & Gritter, 2009) appears promising, more laptop initiatives are likely to be forthcoming, particularly as the price of technology tools continues to decrease. In anticipation of this trend, not only will in-service teachers require professional development for teaching in 1:1 settings, but pre-service teachers will need considerable training and support from their college education programs so as to be fully prepared to assume their own 1:1 classrooms with competence and confidence.

The successes and struggles of early 1:1 adopters, as well as the achievement gains students have experienced, have been relatively well-explored (Argueta, et al., 2011; Penuel, 2006; Zucker, 2005). To some extent, issues of the impact of socioeconomic status for 1:1 users have been explored, as have the benefits of such access for English language learners (DER-NSW, 2010). One area in which there remains some mystery, or at the very least, a need for further information is in the area of writing instruction. One-to-one site-based survey results readily indicate that students like writing with their laptops, and many teachers and parents surveyed indicate that ubiquitous computing access encourages better writing habits (Lenhart, et al., 2008). Studies also reflect that some systems see meaningful achievement gains in writing among groups deemed as using the laptops effectively (Silvernail & Gritter, 2009).

Numerous researchers tout the benefits of technology as a boost to writing instruction (MacArthur, 2006; Penuel, 2006; Warschauer, 2009). English professor Patricia Sullivan (2004) observed early on in *College Composition and Communication* that composing via computer introduced benefits, including “inspiration for teachers to create ambitious, creative

projects, the ability for teachers to demonstrate how visual and verbal elements of a page work together to make meaning, and writing classes characterized by a new and intensely social application" (p. 346). These are indeed exciting possibilities, yet there are few studies that have explored the ways in which teachers are channeling this potential in 1:1 settings. Specifically, there is little in-depth research available that details how teachers have evolved in their writing instruction to accommodate 1:1 laptop access and subsequently utilize the tools available for enhanced teaching and learning in their classrooms.

Purpose of the Study and Tentative Theoretical Framework

The purpose of this qualitative multiple case study, then, was to investigate the ways in which five middle grades English language arts teachers in established 1:1 laptop settings utilize the available technology for writing instruction. Most educators recognize that gone are the days when teachers assign a paper topic to be completed for homework and students simply go home, sit at their desk or at the kitchen table with pencil in hand scrawling notes, and then write carefully in blue or black ink an essay to be turned in the next day for the teacher's sole scrutiny. Instead, many students now head home to use the internet to research their topic, collaborate with classmates online about assignments among other things, and then settle in front of the same screen to watch their words appear and disappear to form sentences, then paragraphs, and eventually, a finished product that may be shared online or with some other extended audience before it is graded. Swenson, et al. (2006) address this transformation, also illustrated in this proposal's introductory vignette, noting "new literacies are in a synergistic, reciprocal, and constantly evolving relationship with older literacies" (p.

357). Changes of this magnitude in the nature of literacy and the writing process surely necessitate certain alterations and adaptations to instruction and methodology.

With the process of writing and the context for communicating vastly different from classrooms of 10 and 20 years ago, the question begs, how are teachers' pedagogical strategies influenced by their students' 1:1 laptop access? With this as a guiding question, the study sought to unearth specific attributes of writing instruction in 1:1 settings and subsequently to describe English language arts classrooms in which teachers are responsible for the successful integration of technology, content knowledge, and pedagogy or TPACK, a framework developed by Mishra and Koehler (2006) to encompass the types of understanding teachers must incorporate in lesson planning for technology-infused settings. While teachers have typically been expected to integrate their content knowledge with appropriate pedagogical practices as originally described by Shulman (1987), TPACK calls on teachers to add to this knowledge base with an understanding of how their content can be taught using technology as well as how their pedagogy is influenced by technology use. Such a scenario creates complexity for experienced teachers and certainly their neophyte peers.

In many respects, the idea that quality teaching results from a blend of meaningful content knowledge, effective pedagogical practices, and powerful technology as outlined by Mishra and Koehler's TPACK, served as the theoretical framework to guide the study. Since TPACK's inception, researchers including Abbitt (2011), Archambault and Crippen (2009), and Harris and Hofer (2009), have conducted related studies confirming the validity of TPACK and its potential to guide teacher learning and professional development endeavors.

Viewing teacher planning, instruction, reflection, and other related behaviors through the lens of TPACK provided a specific model and framework for observing and describing the events of the classroom and then organizing them accordingly.

To gain still further understanding of writing in the 1:1 setting, teacher interviews, classroom observations, and an examination of lesson plans, assigned tasks, and related work products were among the means of gathering insight into the thought process language arts teachers engage in as they plan, deliver, assess, and subsequently reflect on their teaching of writing. Discussions with teachers yielded a great deal of information concerning their philosophy and guiding methodology, and close inspection of their associated written work shed light on the ways in which their approach directly translated into instructional practice.

As an added supplement to the complexity of learning in the 1:1 English language arts setting accurately, two focus group interviews comprised of two or three students each from among the five teachers' classrooms were conducted so as to provide a student perspective on the writing process as they experience it first-hand. In setting up a focus group discussion, the researcher sought to discern how students describe their engagement in the writing process in ubiquitous settings as well as how they articulate the challenges they experience and the methods by which they strive to address them. This aspect of the research process complemented classroom observation and teacher interview data.

Significance of the Study

The study bears significance for three reasons. Primarily, there is a dearth of information concerning writing instruction in the 1:1 setting. The National Council of Teachers of English posits that while trends in technology use contribute to the idea that

writing is more important than ever, current studies indicate that "time devoted to writing instruction and research focused on writing evaluation have both decreased in the last ten years" (NCTE, 2008, p. 1). This is somewhat ironic because it has been suggested that we have entered in a new era of literacy, "the Age of Composition" (Yancey, 2009, p. 5), and it is indeed evident that people spend increasing amounts of time – both professionally and personally - communicating via email, text messaging, and online. Writing proficiency is perhaps as important as it has ever been, yet there are few studies available that have examined writing instructional practices taking place in 1:1 English Language Arts classrooms.

Secondly, this study warrants merit because laptops are becoming increasingly common in the school setting. Current research on 1:1 laptop initiatives does, however, offer mixed results; some reports indicate tremendous engagement and academic gains for students (Penuel, 2006; Russell, et al., 2004; Zucker, 2005), while critics point to misuse, under-utilized or non-functioning equipment, and static student achievement as signs that 1:1 laptops are not a viable means for enhancing student learning (Cuban, 2006; Holcomb, 2009). Such divergent outcomes deserve further exploration so as to clarify and more fully describe potential challenges as well as signs of classroom success in 1:1 settings.

After all, as computers become increasingly affordable, their use is thus likely to become even more widespread in classrooms across the United States and throughout the world. While some teachers will feel confident as they undertake such a transition without learning support, the majority of teachers will seek professional development and reading material that enhance their ability to be effective with 1:1 laptops. This study and its

subsequent findings adds to what is presently known about writing instruction in 1:1 environments, potentially informing teachers, teacher educators, and school leaders.

Finally, the study engaged students in a purposeful discussion about teaching and learning in a 1:1 setting. While some student surveys are available to provide statistics concerning what percentage of adolescents agree or disagree with a variety of statements about technology and learning (Lenhart, et al., 2008), there are few resources available that offer the kind of rich, in-depth information that a focus group of students' discussions on writing can provide. The complexities of the adolescent mind in active contemplation of the writing process make for both meaningful discussion material and tremendous learning potential for teachers and researchers. After all, we can never learn too much about how our students think and how best to meet their needs.

Overview of Methodological Approach and Research Questions

In choosing a particular methodology, a multiple case study approach, deemed by case study expert Yin as a suitable means of studying school innovations (2009), is the most suitable choice as it often reflects a robust undertaking and yields compelling evidence. Concerning research questions, four specific queries drove this investigation. The guiding question was, How are teachers' pedagogical strategies for teaching writing influenced by their students' 1:1 laptop access? Sub-questions to support the primary question included the following:

1. What challenges do teachers and students experience with writing instruction in 1:1 laptop settings?
2. How has 1:1 access changed the nature of writing activities and the use of instructional time for the writing process?
3. How do 1:1 environments impact student writing process?

To begin the study, interviews with five middle grades English language arts teachers with two or more years of experience working in ubiquitous computing settings were conducted. Three teachers were employed at one middle school in a rural district, and the second two were colleagues in a middle school located in another rural district.

Student input shed still further insight into the 1:1 classroom environment. To gather as much feedback as possible, two focus groups of students selected from the five teachers' classes were interviewed so as to gauge the impact of laptops on their learning experiences and their understanding of the writing process in this environment. Patterns and contrasts on students' perceptions and needs based on the challenges they cited emerged from the focus group data analysis.

As a teacher of writing, I had both a personal and professional interest in discerning how ubiquitous computing impacts the various steps of writing process and assessment. While it is widely held that traditional *mark 'em up* grading methods are ineffective, much remains to be learned about the impact of computing on the draft development process and the influence of audience and online feedback on the quality of student writing. While many English Language Arts teachers may work toward a paperless classroom, it should never be at the expense of maintaining a quality writing program.

Definition of Key Terms

For the purposes of this study, the following recurring expressions are defined, with a more in-depth discussion of each to follow as part of the literature review.

1:1 environment: an environment in which a personal digital wireless device with up-to-date software and access to the Internet is distributed to every student and teacher (Corn, 2009; Penuel, 2006).

Day-user: a student who has access to his or her laptop during the school day only rather than being able to transport it to and from home; this status is usually related to a family's inability or refusal to pay local insurance fees (usually $75-150/year) for the laptops, although it can occasionally be attributed to family preference or avoidance of the technology

Multimodal: texts or learning experiences that are neither print nor entirely digital; rather, they require a both/and approach to print and online text leading to classroom experiences that combine digital and traditional literacies to prepare students for similar future life experiences (Carrington & Robinson, 2009).

*New literacies (*sometimes interchanged with *digital literacies*): skills, strategies, and dispositions necessary to 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; they allow us to use the Internet to identify important questions, locate information, critically evaluate the usefulness of that information, synthesize information to answer those questions, and then communicate the answers to others (Kinzer, Coiro, & Cammack, 2004).

TPACK: the Technological Pedagogical Content Knowledge framework developed by Mishra & Koehler (2006) that functions as a representation of the knowledge required to use technology in an educational setting in ways that are contextually authentic and pedagogically appropriate; it describes the intersections among knowledge of pedagogy, content, and technology as the types of knowledge required for teachers to integrate technology into teaching and learning in meaningful ways (Abbitt, 2011).

Ubiquitous computing: machines that fit the human environment instead of forcing humans to enter theirs (York & Pendharker, 2004).

Organization of the Study

In this chapter, 1:1 laptop learning has been discussed as a viable means of increasing student engagement and achievement. Despite considerable research on the benefits of 1:1 access, there exists a dearth of information concerning writing instruction in the 1:1 setting. A qualitative multiple case study approach was best suited to investigate writing in 1:1 classrooms because of its potential to generate robust findings and thick description of a little-known phenomenon.

Chapter Two follows with a review of the most current research available concerning 1:1 laptop programs and subsequent related areas of interest including new and experienced teacher preparation, student learning considerations, and matters of writing curriculum and instruction. Chapter Three then provides an in-depth examination of the setting and research methodology pertinent to the study. Chapter Four next explores the findings of the research process, while Chapter Five ends with a discussion of the findings, implications for teacher practitioners, and recommendations for further research.

CHAPTER TWO: LITERATURE REVIEW

Introduction

Throughout history, mankind has often cast a wary gaze on innovation in spite of its potential to engender progress. In ancient times, Plato cautioned that writing would implant forgetfulness in the soul. During the mid-1800's, author Victor Hugo predicted that books would destroy religion. Today, conservative community members, outspoken parents, and even some traditionalist educators regard technology in schools with foreboding akin to that of Plato and Hugo, who were merely offering commentary concerning the "new technology" of their time. From a modern vantage point, we can reasonably argue that writing has not made us more forgetful, nor have books inspired mass agnosticism. Does it not follow logically, then, that computing in schools has the potential, much like writing and books, to enhance learning and our ability to communicate in ways that will greatly improve society?

After all, people have increasingly come to rely on the combination of technology and the written word to communicate. Adults and children alike now text one another, send and receive emails, maintain an online presence through Facebook or other social networking sites, and blog or comment on posted media offerings such as videos, photos, and news articles. The advent of laptop computers, the internet, and cell phones in the last two decades has redefined what it means both to express one's identity and to keep in touch with others.

It is no wonder, then, that former National Council of Teachers of English president and distinguished Florida State Professor Kathleen Blake Yancey suggests we have entered in a new era of literacy, the *Age of Composition*. She describes this period as one in which "composers become composers not through direct and formal instruction alone (if at all), but

rather through what we might call an extracurricular social co-apprenticeship" (Yancey, 2009, p. 5). Such an idea has yet to find its way into the writing curriculum, nor have teachers been formally prepared to guide this kind of learning experience. Traditional methods of writing instruction, as a result, simply will not enable our students to reach their full potential in these evolving conditions.

Most school administrators recognize the need for a shift in the way that school is conducted, and many increasingly utilize technology to spur gains in student achievement and motivation, with laptop programs having experienced considerable popularity in the past decade. The purpose of this study was thus to investigate how teachers' pedagogical strategies for teaching writing are influenced by their students' 1:1 laptop access. Areas of particular interest include teachers' vision for teaching and learning writing, their understanding of Mishra and Koehler's concept of TPACK, the challenges experienced in such settings and responses engaged in as a result. For a more in-depth, well-rounded picture of classroom activities, the study sought to ascertain how 1:1 laptop programs impact student interest and aptitude for writing as well as the ways in which students articulate their writing process and challenges posed by 1:1 laptop access and instruction.

The research interests described above were inspired by this review of the literature, which is organized thematically into three sections. The first section is devoted to key studies regarding the growth and success of laptop programs across the United States. Existing research detailing teacher professional development and pre-service needs as well as related student pedagogy in the 1:1 setting is provided in the second section. Finally, writing instructional practices as impacted by technology tools are discussed at length to round out

what we already know about teaching writing. In preparing for the interview phase of the study, a review of recent literature detailing 1:1 laptop initiatives is necessary. In one study from New South Wales, key implications for laptop learning included the potential for improvements to student learning as well as improvements in achievement. In addition, professional learning was cited as essential for successful integration as was a shift from a focus on technology proficiency to laptop pedagogy (Peterson, 2011).

Yet respected education reform critic Larry Cuban (2006) asserts there is evidence that reflects a diminutive effect of 1:1 computing on teaching, learning, and student achievement across schools, districts, and states. Does such a finding in conjunction with others that paint a less than flattering picture of 1:1 environments (Holcomb, 2009; Mann, 2008; Shapley et al., 2008) thus indicate laptop learning should be abandoned for less expensive, higher-yield programs? For there to be such divergent opinions concerning 1:1 laptop implementation, there is clearly more that we need to know about the teaching and learning of writing in such settings. The review closes with a discussion of apparent gaps in the existing research base.

1:1 Laptop Program History, Achievements, and Study Findings

Ubiquitous computing access for students has its origins in a private Australian girls' school – Methodist Ladies' College – in February of 1990. At that time, three teachers and 82 fifth grade students received laptops, setting a trend that would accelerate a few short years later with Microsoft and Toshiba's *Anytime, Anywhere* learning initiative that supplied 53 American public and private schools with 1:1 access in 1996. Seven years later, over

100,000 students nationwide had participated in the program (Ross, Lowther, Wilson-Relyea, & Wang, 2003).

By the turn of the century, 1:1 programs were more common across the country, with the Henrico School System in Virginia boasting the largest laptop distribution nationwide after a deployment of laptops to all of its middle and high school students and teachers in 2000, and the state of Maine leading the first statewide implementation in 2002 with laptops for all of its seventh and eighth grade students. Texas followed shortly thereafter with a four-year $14.5 million pilot program comprising 22 schools. Several other states including Florida, Michigan, New York, Pennsylvania, California, South Dakota, Connecticut, New Hampshire, and Alabama soon followed with smaller-scale laptop adoptions (Argueta, et al., 2010; Weston & Bain, 2010).

In North Carolina, Greene County Schools served as a forerunner for ubiquitous computing access when it entered into a partnership with Apple Computers in 2003 to provide MacBooks for all of its middle and high school students and faculty. A predominantly rural area with more than 75% of families qualifying for free or reduced lunch status, Greene County reports that, after nearly a decade of 1:1 laptop access for its upper grades students, over 90% of high school graduates now attend college. In the last decade since Greene's early adoption, nearly 50 additional school districts have implemented some form of 1:1 program or are in the planning phase, and over 70 schools across the state are now actively engaged in 1:1 instruction (Corn & Emer, 2010).

Another district receiving national attention for its laptop initiative is the Mooresville Graded School District just outside of Charlotte, NC. Since beginning its program in 2008,

the graduation rate for students has soared to 81 percent, and the district boasts the third highest rate of test scores in the state, with an average of 88 percent of students performing at or above grade level. School attendance rates have risen, as has interest in living in the community. Though the district ranks 100th out of 115 districts in the state in per pupil spending, having allocated a mere $1.1 million each year to fund the program's MacBooks and requisite software, the comparatively modest investment has engendered an enviable return that has subsequently inspired significant interest from educators across the country (Schwarz, 2012).

Other initiatives across North Carolina are seeing positive attributes to 1:1 learning as well. A 2009 review of programs in the *North Carolina Learning Technology Initiative* found that participating schools experienced a decline in dropout rates and increases in student engagement, attendance rates, and the practice of 21st century learning skills (Corn & Emer, 2010). Similar success stories appear nationwide; in California, for instance, 1:1 laptop users outperformed their non-laptop enabled peers in the areas of literacy response and writing strategies on the English Language Assessment portion of the California Standards Test (DER-NSW, 2010). Even more encouraging is the evidence of still greater improvement for these same students during the second year of ubiquitous computing implementation (DER-NSW, 2010). A more extensive two-year study of 10 laptop-enabled schools in Maine and California inspired Warschauer (2005/2006) to cite five reasons to initiate 1:1 laptop programs. These included greater engagement through multimedia, deeper learning, easier integration of technology, the development and practice of twenty-first century learning skills, and opportunities for more and better writing. With the majority of

1:1 initiatives yet in the early phase of implementation, it is likely that similar successes will be recognized as time progresses.

Key steps necessarily must be undertaken to engender a successful 1:1 program. Research initiated by a team of North Carolina State University professors (Spires, et al., 2009, p. 3) sheds considerable light on various important aspects for effective 1:1 laptop learning. Dubbing the 1:1 environment as a "new learning ecology," the team characterized four conditions worthy of investigation. These include the presence and subsequent impact of "immediate and constant access to information and a global community, intensity, relevance and personalization of learning, highly-developed teacher capacities, and highly-developed student dispositions".

Following a thorough exploration of these conditions, the team recommended five specific strategies to utilize in planning professional development for teachers. The strategies, which include technological pedagogical content knowledge (known as TPACK), project-based inquiry, a global skill set, performance-based assessment, and professional learning communities and networks (Spires et al., 2009), are described at length with specific connections to Bloom's Revised Taxonomy, successful professional learning communities attributes, project-based inquiry processes, effective professional development suggestions, and a review of Koehler and Mishra's TPACK framework. This white paper provides a quality resource for educators seeking introductory information in undertaking a 1:1 laptop program.

A follow-up article by members of the same team (Spires, et al., 2011) builds on their previous research to explore further the complexities of 1:1 laptop settings to prepare

teachers and students for a successful implementation. Exploring existing research, the article also looks at the changing landscape of school-community relationships, school and what we know about effective teaching, and concludes with suggestions for professional development for teachers to ensure quality of instruction for 1:1 settings.

Penuel's 2006 research synthesis of 1:1 programs adds to educator understanding as well. Often cited by recent 1:1 program researchers and practitioners, the synthesis describes the goals for adoption as generally falling into one of four expected outcomes: increased student achievement, equity of access to reduce the digital divide, enhanced economic competitiveness for a community or region, and greater quality of instruction (Penuel, 2006). While several studies report increases in standardized testing measures for laptop learners, Penuel notes that there is less clarity concerning the potential of 1:1 access to enhance core subject performance. In addition, while numerous studies point to positive effects on student motivation or engagement, increased organizational skills, and access to a wider, more contemporary research base for inquiry learning, Penuel (2006) laments that many studies lack stringent reliability or validity measures.

Bebell, O'Dwyer, Russell, and Hoffman echo this concern more recently in a 2010 *Journal of Research on Technology in Education* article that cites a shortage of quality empirical research looking at the impact of computing in schools. They assert that current research "fails to capture the nuanced ways laptops are being used in schools and to align learning outcome measures with the measures of student learning" (47). The team thus perceives a need for information as to how laptops are used in core subject areas and how those uses impact student learning.

Limitations and Challenges Associated with 1:1 Programs

While the potential for quality teaching and learning with 1:1 laptops is generally apparent, there are indeed limitations with which to contend. Holcomb (2009) notes in a *Tech Trends* report on lessons learned from 1:1 initiatives that merely providing students with laptop access is insufficient; rather, how teachers decide to utilize them is of greater importance (Holcomb, 2009). Penuel (2006) notes that teachers often receive training concerning personal use of computers, but do not have adequate experiences learning to integrate technology as part of their lessons. Other studies (Garet, et al., 2009; Morrison, et al., 2009) cite the failure of professional development efforts to prepare teachers to best utilize 1:1 laptop settings or to make appropriate allowances for time and collaboration (Holcomb, 2009; Shapley, et al., 2009) so that teachers may develop a more in-depth understanding of the tools available and plan lessons and activities accordingly. Without training and time, teachers will understandably struggle to utilize laptops for maximum learning.

A related study from Russell, O'Dwyer, Bebell, and Tao in 2007 reveals that teachers who were new to a school setting typically used technology less with their students than colleagues who had been at the school for 3-10 years. While this result could possibly be attributed to a focus of newer teachers on understanding the curriculum and adjusting to an unfamiliar school culture in favor of working to fully implement technology tools, is it also possible that these teachers may be lacking the time and appropriate professional development necessary for their success? The study implies as much, indicating that further funding and research are necessary to fully explore the effects of technology use by teachers

and students. This finding may be of particular concern for teacher educators as well considering that their students may be destined for a similar setting.

Aside from professional development, schools experience yet another challenge related to laptop learning. At the present, most standardized assessments do not align well with the skills that 1:1 settings cultivate. Teachers recognize the development of 21st century skills as extremely important, yet standardized tests do not measure their students' growth in that area. Harvard Education professor Chris Dede adds gravity to this dilemma, noting of students that "many … who excel academically do not fare well later in life; the challenges of work, citizenship, and daily life do not resemble the multiple-choice items on high-stakes tests" (Dede, 2008). So long as accountability measures do not emphasize the skill set valued in schools and the business setting, educators may well wonder if the benefits of laptop learning will be enough to correct the disparity.

Laptop program limitations, unfortunately, are not confined to teachers and methods of assessment. Perhaps not surprisingly, students have been found to use their laptops inappropriately. In addition to ever-present temptations during instructional time to check email, surf the Internet, and play video games, studies cite that students use their laptops to "cheat on tests, download pornography, and hack into school and local business networks" (Holcomb, 2009, 52). A study by Wilson in 2005 noted that 1:1 settings were sometimes characterized by males increasingly tempted to play video games, females distracted by their peers' laptop activities, and both sexes with an increased temptation overall to multi-task. Recent research on multi-tasking, interestingly, has shed light on its counterproductive and potentially harmful nature (Hamilton, 2011). In addition, McGrail (2007) observes that

ubiquitous computing sometimes leads to students' social isolation and limited communication with teachers and peers. Neither of these side effects is especially supportive of the individual student's mental health or the classroom climate overall.

It is no wonder, then, that some school systems see mixed results from laptop learning, and in a few instances, even abandon 1:1 environments. In Texas, the laptop initiative, known there as Technology Immersion, was described after seven years as having no significant impact on achievement in reading for middle grades students as measured by the Texas Assessment of Knowledge and Skills (Shapley et al., 2009). More troubling, however, were further findings that merely one-quarter of the 22 participating schools achieved substantial immersion levels, i.e. frequent use of the equipment by teachers and students for learning purposes. Students in the remaining 15 schools described usage and access for student work that fell far short of expectations by the fourth year. As a result, there was little evidence available connecting laptop usage to increases in students' self-directed learning or schoolwork satisfaction (Shapley et al., 2009).

How can the varying rates of success with 1:1 programs be explained? Perhaps the divergence in results relates to how the laptops are actually used in daily learning. For schools seeking to build a successful 1:1 program, a useful resource is Zucker's 2005 *Policy Brief for the One-to-One Computing Evaluation Consortium*. In the publication, Zucker cautions that 1:1 programs are not as facile as putting a laptop at every child's desk and expecting tremendous strides in student learning. Rather, schools and systems must plan thoroughly and focus on specific goals that are prioritized as necessary to accomplish. Five specific areas to which particular attention and care are required for a successful

implementation include planning, professional development, hardware and software, managing change, and program monitoring and evaluation (Zucker, 2005). Ignoring one or more of these areas likely contributes to the mixed results sometimes referenced in the literature.

Further barriers to effective 1:1 laptop implementation cited across the available research include a lack of leadership and vision consistently applied throughout the process, chronic technical issues that burgeon as time passes, and a lack of appropriate or sufficient training for teachers, both at the onset and throughout various phases of the initiative. One study (Shapley, et al., 2009) even found that student laptop use at home for learning and homework was the best indicator of students' achievement scores. A lack of parental support for the full utilization of laptops at home, then, could potentially serve as an additional obstacle to 1:1 student success.

Variable outcomes such as those reflected in the research on ubiquitous computing environments require further exploration because as computers become progressively more affordable, their use is likely to become even more widespread in classrooms and school systems across the United States and throughout the world. In anticipation of such an increase in the number of 1:1 environments, a team of North Carolina State University researchers at the Friday Institute for Educational Innovation examined 12 high schools piloting a 1:1 initiative to discern critical components for a successful program. They concluded that a strong, compelling leadership-driven vision for the goals to be accomplished as well as shared decision-making among all stakeholders function as initial requirements. Further steps in the process for school communities involve careful planning for the

infrastructure, equipment, and software selections as well as the ample allowance of time for planning, collaboration, and professional development for teachers (Corn, et al., 2010). In addition, attention to modes of communication and program evaluation foster increased opportunity for a successful implementation. While results are yet preliminary, this study among others strongly suggests that ubiquitous computing environments "better prepare students for their future in a globally-connected, technologically-supported world" (Corn, et al., 2010, p. 16).

Teacher Needs in 1:1 Settings

Teachers naturally play a critical role in laptop technology integration efforts. Numerous studies indicate that when teachers believe that technology can support student learning and provide tools that add value to the curriculum, they will be more likely to use it (Penuel, 2006). One-to-one initiatives that include professional development specifically demonstrating how to improve instruction and tailor curriculum content resources, therefore, have the best opportunity to make meaningful improvements to teaching and learning (Morrison et al., 1999). In addition, time for collaboration and professional development activities with peers have proven to contribute to program effectiveness (Garet et al., 2001).

In considering professional growth, veteran teachers also possess considerable knowledge based on their personal training and classroom experiences. In a dissertation study looking at the prevalent needs of experienced teachers when integrating technology, researcher Lisa Hervey (2011) found that teachers requested help in three areas: differentiated training, meeting varied learning needs in the classroom, and time for teachers to practice new skills together. A related observation comes from Swenson, Young,

McGrail, Rozema, and Whitin in a 2006 *English Education* article titled "Extending the Conversation: New Technologies, New Literacies, and English Education". The authors suggest that English Language Arts teachers need "release time, as well as access to new technologies and to high quality professional development in order to critically and productively evaluate the potential of these technologies and literacies for their students" (p. 366). Once these components are in place, teachers effectively have the building blocks necessary for laptop technology integration success.

Michigan State University professor Punya Mishra provides a meaningful tool for teachers with his development of a framework for teacher knowledge for technology integration. Known as TPACK, the structure of overlapping circles, akin to a Venn diagram (see Figure 1 below), emphasizes the teacher's areas of understanding that include curriculum, pedagogy, and technology. While teachers are often trained to teach a certain content area, they also receive instruction in various pedagogical strategies. Shulman (1987) provides valuable information concerning the interplay of pedagogy and content knowledge, describing it as PCK. With the advent of classroom technology applications, teachers not only make adjustments to their teaching to incorporate traditional areas of content and pedagogy, but they have to understand how technology intersects successfully with each aspect to enhance learning for students. Technology thus impacts students in terms of pedagogical considerations as well as for content purposes. Ultimately, teachers become responsible for integrating all three areas seamlessly for optimal learning.

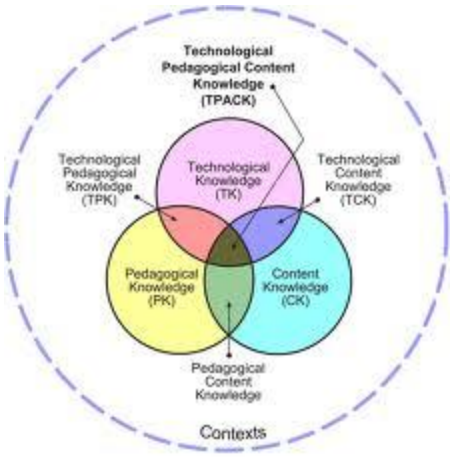

Figure 1. Mishra & Koehler's Technological Pedagogical Content Knowledge Framework (2006).

Building on Shulman's (1987) seminal work concerning pedagogy and content knowledge, Mishra argues that TPACK is "a form of knowledge that expert teachers bring to play anytime they teach" (Mishra & Koehler, 2006, p. 1030). Using TPACK, teachers can implement authentic design-based activities that "allow students to learn in contexts that honor the rich connections between technology, the subject matter, and the means of teaching it" (Mishra & Koehler, 2006, p. 1047). Understanding of this framework enables 1:1 laptop educators to plan instruction that fully utilizes the technology they have at their disposal.

With time and appropriate training, some teachers may feel confident enough to undertake the transition from traditional classroom learning to the 1:1 environment without requiring a great deal of further support. The majority of teachers, however, likely need independent professional development opportunities and reading material to enhance their ability to be effective with 1:1 laptops. Thankfully, there is a wealth of enlightening

information available through various practitioner magazines, websites, and other modes of publication for educators seeking ways to enhance learning using laptop technology.

Organizations including the National Council of Teachers of English, the International Society for Technology in Education, the Society for Information Technology & Teacher Education, the George Lucas Educational Foundation, the Consortium for School Networking, and the Association for Media and Technology in Education among others maintain websites and craft publications to guide technology and laptop use in school settings. The Friday Institute for Educational Innovation at North Carolina State University hosts a website – https://www.fi.ncsu.edu/project/nc-11-learning-collaborative - with numerous laptop program resources including research briefs, presentations, podcasts, and listings for educational speakers and events.

Perhaps a more comprehensive resource for technology integration is the National Council of Teachers of English (NCTE), which partners with the International Reading Association to author *ReadWriteThink.org*, a website for language arts and English teachers. In addition, NCTE publishes three journals – *Research in the Teaching of English*, *English Journal*, and *Voices in the Middle* – that frequently highlight computer applications for instructors and students. The organization has a numerous and far-reaching membership and is well-regarded in the K-12 and university community.

Considerable emphasis has been placed in NCTE publications and other related sources on the use of multiple media and new literacies. Numerous researchers and practitioners report that in the K-12 public school setting, technology use can be particularly promising because it aids efforts to differentiate among students of varying ability. In

addition, it is widely held that struggling students possess a critical need for engaging, technology-rich literacy experiences (Ranker, 2010). Articles abound illustrating the various means by which students are increasingly engaged in their work and motivated to take responsibility for their own learning.

For example, high school English teacher Laura Rochette (2007) describes the transformation of teaching and learning in her classroom engendered by a SmartBoard and student laptops in a reflective *English Journal* piece titled, "What Classroom Technology Has Taught Me about Curriculum, Teaching, and Infinite Possibilities". Students in her class draft papers together, construct research projects around the use of historical documents, literary texts, and visual media, articulate connections between fine art and literature, and craft blogs. She notes, "The more acquainted I become with the digital environment, and the more I see the intersections between this environment and interdisciplinary teaching, the more possibilities I see for appealing to students' multiple intelligences" (p. 48). This account demonstrates yet another way that the thoughtful use of laptops can better meet student needs.

In another *English Journal* edition (2007), literature teacher Cara Arver describes the process of creating a virtual world for her students online as they read and responded to William Golding's *Lord of the Flies*. Reflecting on the experience, she acknowledges the difficulties and uncertainty she faced while trying a new approach, but also observed that "the virtual world opened up new ways to work together as a class and a team, with students drawing connections between their lives and those of the characters they read about… (the experience also) led to higher-order thinking and new perspectives" (Arver, 2007, p. 41).

Students engaged in such meaningful experiences learn valuable 21st century skills for future success.

Nancy Bailey's five-month participant-observer study (2009) of English 9 teacher Carol echoes a similar sentiment. After watching Carol adopt a new literacies stance that informed the development of a corresponding curriculum, Bailey observed Carol begin to value new literacies less as a way to 'hook' students and more as a means of carrying out a literacy curriculum. Students demonstrated increased proficiency with higher scores on their standardized test, but more importantly, the possession of "new powers brought about by a growing understanding of literacy as social practice and growing mastery of literacy as a medium of self-discovery and self-expression" (p. 231). This self-awareness and personal growth is tremendously beneficial for students.

Yet another example of the power of laptops for teaching and learning in the classroom setting is described by middle school English teacher Brenda Knobloch (Bugenhagen, 2011). The use of Google web mail and Google documents enabled her to lead students in collaborative writing activities that better utilize writing process and increase student engagement in their work. Bugenhagen describes Knobloch's enthusiasm about the activities that 1:1 laptops make possible; though she indicates occasional technical challenges – freezing screens, dead laptop batteries, etc. - do occur, she believes the benefits outweigh any incidental drawbacks.

In the realm of higher education, various studies have examined facets related to middle and secondary learning including the potential isolation of online interaction and the influence of 1:1 access on the writing process among students. One 2010 study by Dave and

Russell looked closely at the drafting and revision process of technology-savvy college writers to understand how computing altered their writing process. Utilizing a qualitative approach involving participant surveys, coding, and cross analysis of data, the team determined that what a draft means today is considerably more varied, disjointed, and complex than it was prior to the advent of technology tools (Dave & Russell, 2010). In addition, it came to light that nearly 50% of young writers still print out frequently to help them revise, leading to the idea that "paper is complementing and enhancing writing in ever more complex ways" (p. 429). Dave and Russell conclude with a call for further research on the ways technology tools affect students' writing processes so as to further practitioner understanding of the means by which students become fluent writers.

Mehlenbacher (2010) adds to the knowledge base concerning technology and learning with his book, *Instruction and Technology: Designs for Everyday Learning*. His work introduces the notion of three primary learning worlds – work, leisure, and educational settings – that shed new meaning on the notion of when, where, and how people learn. The book also offers an extensive investigation of the literature related to instruction using technology and a review of the influence of technology on our communication processes as well as strategies and design models appropriate for effective use of technology for instructional purposes. Perhaps the most significant contribution of this book is its collection of position statements by numerous researchers drawn from the commendable investigative effort. These conclusions generally revolve around demonstrated growth and considerable potential for distance education, though the lessons apply well to technology-enhanced learning and 1:1 laptop access.

In addition to a rich research discussion, Mehlenbacher explores other areas including web-based instruction, assessment, artificial learning environments, cognitive processes, and writing. Considering pedagogy and technology instructional practices in the context of the content areas, he advocates seven areas of emphasis in planning instruction: 1. Learners, 2. Instructors, 3. Instructional strategies, 4. Content, 5. Group interaction, 6. Learning outcomes, and 7. Institutional context (Mehlenbacher, 2010). While these areas overlap somewhat with more traditional lesson planning elements, they nonetheless serve as important touch points for appropriate technology integration planning. In integrating technology effectively, each of the seven aspects must be given careful thought during the planning phase so as to best utilize the tools for maximum student learning.

Two recent books that enable a similar effort include Beverley Crane's *Using Web 2.0 Tools in the K-12 Classroom* (2009) and Kristen Nelson's *Teaching in the Digital Age: Using the Internet to Increase Student Engagement and Understanding* (2008). Both books offer specific rationale and reasoning for concerted attention to technology integration. Crane explores blogging, podcasting, literature wikis, digital storytelling, Google research, social bookmarking, and English Language Learning opportunities for students encompassing multiple subject areas using numerous tables, figures, lists of specific sites, and other resources to provide teachers immediate tools to enhance their planning. Nelson, on the other hand, takes a different approach by emphasizing current trends in curriculum theory including brain-compatible learning, multiple intelligences, higher-order thinking and problem-solving skills as well as the development of interpersonal and information-gathering skills through the use of Internet-based activities. This text addresses these areas by offering

teachers a research-based rationale and specific strategies for incorporating each of these skill sets into the daily curriculum. A list of websites and numerous technology-themed rubrics for teacher use are included to supplement the reading. These are among the more recent comprehensive publications intended to support teachers in their technology integration efforts.

Professional Development & Novice Teacher Considerations

Novice teachers will benefit greatly from the variety of available resources, though adequate preparation for laptop environments must begin far earlier than the first days of one's career. Particular consideration and understanding should be devoted to the learning journey that successful teachers of writing experience as they grow into accomplished English language arts educators who seamlessly integrate technology. For instance, what knowledge do they acquire and in what ways does the acquisition occur so as to enable teachers to plan and deliver meaningful technology-rich instruction? Developing an awareness of pre-service teacher needs, experiences, and challenges as described in the literature provides an important perspective for more effectively comprehending teacher decision-making and strategy selection in the English Language Arts classroom.

Concerning novice teacher understanding of technology integration in the 1:1 classroom setting, Abbitt (2011) poses perhaps the million dollar question concerning successful learning in 1:1 laptop settings when he questions what amount of knowledge of technology, pedagogy, and content is sufficient for a beginning teacher. While many pre-service teachers are rather adept at technology use, merely knowing how to use technology does not equate to their being able to teach successfully with it. The 2006 edition of the

Guidelines for the Preparation of Teachers of English Language Arts from the National Council of Teachers of English indicates that future teachers should have opportunities to develop their understanding of teaching and learning processes by way of experiences that include "a wide range of verbal, visual, technological, and creative media and experience the integration of reading, writing, speaking, listening, technology, and various media within lessons" (NCTE, 2006). Despite this recommendation, results from a joint Milken Family Foundation and International Society for Technology in Education national survey (Moursund & Bielefeldt, 1999) reflect that teacher preparation programs in general do not provide their charges with the experiences necessary to use technology effectively in their own classrooms.

Reflecting on educational philosophy, John Dewey (1938) reminds educators that our activities should prepare students for later experiences of greater depth and higher quality, and pre-service instruction is no exception. As a result, teacher preparation initiatives must continue to increase the level of technology integration within their existing programs. This practice serves as a model for students that facilitates exposure to strategies that enhance learning. We know, however, that students attain knowledge by doing; when they are empowered to take control of their learning, they transcend the passive learner role for a richer, more meaningful educational experience that later translates to similar significant learning opportunities for their own students.

Going a step further, then, Feinman-Nemser (2001) notes that learning by design, which involves understanding a student's present needs and appropriate goals for instruction and subsequently responding with necessary activities and structures to help students achieve

understanding, enables students to create a foundation for building their beginning repertoire of effective teaching strategies. Such a "toolkit," however, cannot be taught traditionally; rather, it is "experienced in activity, depends on recognition of design quality, entails a creative process, is understood in dialogue and action, and involves reflection in action" (Mishra & Koehler, 2006, p. 1035). These kinds of activities, then, must be central strategies for technology integration within pre-service teacher programs for maximum effectiveness.

Another powerful means of strengthening new teacher understanding of the role of technology in conjunction with content and learning involves active and purposeful utilization of Mishra and Koehler's Technological Pedagogical Content Knowledge Framework, known as TPACK. Mishra asserts that crafting quality content requires a purposeful blend of three knowledge sources: technology, pedagogy, and content (Mishra & Koehler, 2006). Perhaps not surprisingly, Mishra's research team found that young teachers who received opportunities to engage in the design of educational technology showed major growth in their discernment of the multi-faceted interactions among content, pedagogy, and technology, thus strengthening their TPACK (Mishra & Koehler, 2006). In addition, such engagement in authentic design activities "compels teachers to seriously study the complex relationships between technology and education… participants think deeply about evaluating the needs of the audience and configure their design to meet those needs" (p. 1046). Practice experiences of this nature enable pre-service teachers to develop valuable habits of planning instruction that are student-focused.

Researchers Harris and Hofer (2009) further simplify this process for practitioners, citing three conditions for planning success: "1. learning goals have been selected well; 2.

pedagogical decisions have been made according to students' instructional and contextual realities; and 3. activity types and assessment strategies have been selected to address those goals and realities" (Harris & Hofer, 2009, p. 107). When these components have been addressed, instructional choices for students become more straightforward. In addition, Harris and Hofer collaborated with Young in 2011 to develop a Secondary English Language Arts Learning Activity Types document that guides teachers to possible technologies for each of 67 cited learning activities (Young et al., 2011). By identifying the most common activities that take place in language arts classes and then pairing them with suggested technology applications, the document provides teachers at every level with practical ideas for integrating technology into what they are already doing. Utilizing available tools such as the Learning Activity Types document as pre-service teachers takes some of the guesswork from deciding how to integrate technology effectively.

After all, pre-service teachers enter college with many ideas about teaching, but they generally have little practical experience teaching with technology. To gain valuable insight into pre-service teachers' knowledge of technology, pedagogy, and content in addition to their subsequent cognitive growth in those areas, teacher educators have access to the Survey of Pre-service Teachers' Knowledge of Teaching and Technology (Abbitt, 2011). Developed in conjunction with Mishra and Koehler's TPACK framework, the survey is not specific to English Language Arts or 1:1 laptop instruction, but it does enable teacher educators to access data concerning their students' initial, ongoing, and final understanding of TPACK. Survey results may be used to plan areas of emphasis based on students' entry-level knowledge, address deficiencies that persist as students move through the curriculum, and

work toward continuous program improvement overall as students graduate and move into classrooms of their own.

A complementary tool available to teacher educators for effective modeling and technology use with students is the Technology Integration Assessment Rubric, described by Harris et al. (2010). Likely best used during student teaching or internship-style learning experiences, the rubric is intended to serve as a performance-based assessment of student work that shows how perceived knowledge is evident in the planning of instruction (Abbitt, 2011). The instrument provides instructors a tangible impetus for discussion and reflection to guide student growth and understanding.

With purposeful teaching and guidance, English language arts pre-service teachers likely recognize that the classrooms they will lead should be places of inquiry and innovation inspired by the world around them. Among the concepts in their active knowledge base, therefore, must be an understanding of New Literacies, defined by Leu, Kinzer, Coiro, & Cammack (2004) as

> 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 ICT's to identify important questions, locate information, critically evaluate the usefulness of that information, synthesize information to answer those questions, and then communicate the answers to others. (p. 1570)

Such literacies bear increasing importance on quality learning, and they will likely continue to evolve as individuals spend greater amounts of time online. The vast majority of veteran teachers recognize the advent of these "New Literacies" as results of a 2008 National Council of Teachers of English survey demonstrated, with 84 percent of educators believing their students need considerable guidance navigating the vast array of information resources available online. It is of paramount importance, then, that pre-service teachers have ample opportunities to engage in discussion and activities reflecting New Literacies so as to be well-prepared to guide their students productively, particularly in 1:1 settings.

It is important to note that guiding students productively involves not only an understanding of New Literacies but also an awareness of the potential for student distraction in the 1:1 English Language Arts setting. The difficulties some schools have encountered with student use of laptops as discussed earlier (rampant cheating, hacking, and downloading inappropriate material) have been so dire as to end site initiatives. Teacher preparation programs would thus do well to equip their students proactively with methods proven to minimize student distractions in the English Language Arts setting. Training with classroom responses systems and monitoring software in addition to experiences establishing ground rules for wireless use and the discussion of designating regular pockets of time as "no laptop use" are among the positive means of addressing and subsequently reducing student distractions in the 1:1 setting (Tagsold, 2012).

Just as K-12 teachers strive to understand and accommodate the evolving needs of their tech-savvy students, teacher preparation instructors should give similar consideration to

Neomillenial learning styles (Dede, 2005). According to Dede, students in higher education increasingly demonstrate the following key attributes:

> fluency in multiple media and in simulation-based virtual settings, a preference for communal learning involving diverse, tacit, situated experience, with knowledge distributed across a community and a context as well as within an individual, a balance among experiential learning, guided mentoring, and collective reflection, expression through nonlinear, associational webs of representations, and the co-design of learning experiences personalized to individual needs and preferences. (Dede, 2005, p. 7)

These students are also called the "Undo Generation," a phrase coined by Jackson (2008) because they have grown up in a time when they could always "undo" their electronic mistakes. Alan November (2011) follows this way of viewing students with the suggestion that they have opportunities to practice empathy and global sensitivity. Taking into account these assertions, teacher educators can most aptly serve their students by understanding how they learn and fostering settings that readily facilitate such opportunities. Again, attention to modeling effective strategies pays dividends in the future when these students assume their own classrooms.

Student Benefits and Considerations

To shed light on the sometimes ambiguous young adult mind, the National Commission on Writing and the Pew Internet and American Life Project embarked on a 2008 study titled *Writing, Technology, and Teens* (Lenhart et al., 2008). Several intriguing findings emerged from the nationwide survey of 700 teenagers and their parents randomly

selected as a representative sample of the U.S. population. For instance, 86 percent of teenagers believe that writing well is important to success in life. While nearly half of students indicated they enjoyed non-school writing a great deal, only 17 percent enjoyed school writing. When students were queried as to what motivated them to write in school, they cited "relevant, interesting, self-selected topics, coupled with feedback from adults who paid attention and challenged them" (p. vii). A related response indicated that close to 60 percent of teens polled believed that when they used computers to write, they were more inclined to revise or edit their work. This process, of course, leads to a higher quality writing product; while it is admittedly possible to address these preferences in a traditional classroom setting, the 1:1 laptop program uniquely empowers students and their teachers to engage in high-quality writing workshop activities.

Of course, parents offer a valuable opinion concerning their children's writing and the benefits of 1:1 access as well. Nearly 70 percent of those polled in the *Writing, Technology, and Teens* 2008 survey indicated that they felt their children could write better using computers because of the ease of revision and editing. The majority of parents also agreed that computer access enabled their children to present their ideas more clearly. On a more philosophic note, 83 percent of parents felt there is presently a greater need to write well today than there was two decades ago. Close to half of the parents polled also believe their children write more now in school than they themselves did as young adults. Should this truly be the case, greater attention must be paid to the manner and methods in which writing instruction is carried out.

Surveys of teachers indicate that they, too, identify changes in society that impact their English Language Arts students. A 2008 National Council of Teachers of English poll of over 900 practitioner respondents indicated that 84 percent recognized that their students had a strong command of technology for entertainment purposes, but believed their charges needed to know more about using technology for understanding and creating texts. The majority of teachers indicated that decision-making and analytic skills must be developed simultaneously with traditional academic skills. In addition, over 90 percent of teacher respondents reported the top attributes for student success as "1. The ability to seek information and make critical judgments about the veracity of sources; 2. The ability to read and interpret many types of texts, and 3. The ability to innovate and apply knowledge creatively" (NCTE, 2009, p. 1). For their part, these teachers agreed that success occurs when classroom work is connected to real-world situations that students will encounter in their future lives (NCTE, 2009). Teaching methods identified for accomplishing this goal included project-based learning, inquiry-based learning, and significant opportunities for student choice. Naturally, 1:1 laptop settings can provide the needed flexibility and opportunities these instructional practices necessitate by permitting students ready access to online resources, software for creating products, and convenient tools for collaboration and communication.

The NCTE teacher survey results are supported by Kulik's 2003 meta-analysis of writing research, which examined 12 studies of student writing and technology integration conducted between 1990 and 2002 as part of a larger review of literacy learning. Kulik's review of the literature found that students at both the elementary and secondary levels who

use word processing for writing compositions typically develop better writing skills than students without word processing capability. In addition, K-12 students with ample access to computers akin to 1:1 settings perform better in writing than their peers with fewer or no opportunities for computer access. In technology-rich settings, students can easily pursue independent research and write at their own pace while the teacher is available to conference freely with her charges about their specific needs as they compose, revise, brainstorm, or otherwise work toward their finished product.

Ubiquitous computing environments afford still other advantages for students. Of considerable importance, students have at their fingertips a source of information that they might never have previously been able to access. This makes possible a "range of representations, analogies, examples, explanations, and demonstrations that can help make subject matter more accessible to the learner" (Mishra & Koehler, 2006, p.1024). While students in the past have often relied on the teacher as their sole source of information, they now have a vast array of resources for clarifying difficult concepts and gaining additional information on subjects of personal interest. Inquiry-based learning can be facilitated as a result.

One-to-one access thus leads to another benefit: increased student engagement and motivation. Numerous studies support the assertion that students will devote additional time and work more conscientiously on a piece of writing for their peers or the local community. Student motivation, then, plays a considerable role in the classroom climate. Professors Frey and Fisher (2010) observe, "Students, even those who routinely drag themselves through the

school day, find reasons to read, write, discuss and create when in the company of like-minded peers" (p. 30).

Further elaborating on this idea, MacArthur (2006) notes that communication with peers in class and online may cause students to think more carefully about their audience and to be more explicit and elaborative in their writing. He suggests that the authentic nature of the writing and the ease of technology tools may motivate students to write in increasing amounts (MacArthur, 2006). As a result, teachers in 1:1 laptop settings can often modify assigned tasks to devote more effort to inquiry methods inspired by student interests and their real-world worries. Researchers observing 1:1 language arts settings cite increased motivation for writing, generous amounts of writing, and evidence of students attempting to understand differences across cultures and to be more sensitive to audience needs (MacArthur, 2006).

Delving still further into the importance of student interest, researchers Ryan and Deci (2010) posit that teachers cannot make someone motivated; instead, they may create motivating learning environments. For students, this occurs when they feel "1. some sense of autonomy, 2. connected to the class, and 3. that they have the skills necessary to meet the challenges of school" (Daniels, 2010, p. 25). This summary echoes popular education writer Daniel Pink (2010) in his assertion that people are most motivated by a desire for autonomy, purpose, and mastery. Considering both lists, it is not too great a stretch to conclude that ubiquitous computing environments can enable teachers to create a purposeful learning environment in which students experience autonomy while mastering meaningful tasks and

concepts at their own pace with ample opportunities for feeling connected to their peers, and to some extent, the world beyond the classroom.

In thinking of the world beyond the classroom, 1:1 laptop settings also lend themselves readily to learning activities that foster the acquisition of 21st Century Skills. While frequently engaged in the development of their information, media, and technology skills, students have the tools in place to complete projects that promote creativity, critical thinking, collaboration, and communication in addition to enhancing pertinent life and career competencies. Using laptops regularly for creative, collaborative efforts prepares students for similar experiences in the work world.

The 21st century skill set overlaps considerably with the recommendations of the National Educational Technology Standards for Students (2007), which were developed by the International Society for Technology in Education to guide technology learning across the country. The standards emphasize creativity and innovation, communication and collaboration, research and information fluency, critical thinking/problem solving/decision making, digital citizenship, and technology operations and concepts (ISTE, 2010). Ubiquitous laptop access clearly enables the development of such skills.

The student perspective concerning laptop access and writing is noteworthy. The Littleton Public Schools district, a suburban system near Denver, Colorado, demonstrates a history of emphasizing writing throughout the curriculum and distributed laptops to its upper grades students in 2008 to support writing instruction and process. An examination of 1:1 student blogs from the district revealed six recurring themes offering insight into the value that students see in having 1:1 laptop access. These include tools for better writing, access to

information, opportunities to share and learn, self-directed learning, relevance in a technological world, and engagement with new media (Warschauer, Arada, and Zheng, 2010). When students enjoy their work and have the resources to complete the given tasks, they are typically more motivated and successful in the classroom.

Perhaps more tangible benefits for students in 1:1 settings exist in the variety of opportunities for learning that are authentic, experiential, hands-on, and project-based (Lowther et al., 2008). Both learners and instructors have much to gain when classroom pursuits are enjoyable and purposeful. Activities facilitated by ubiquitous access that include, but are by no means limited to, the creation of oral histories, online museums, documentaries, electronic newspapers, literary magazines, Facebook pages for literary characters, Google maps of character journeys, and webpages all enable students to express themselves and the fruits of their learning in ways previously unimaginable. Classroom learning is thus generally limited only by the imaginations of those in occupancy.

Considering that we live in a time of hyper-accountability for academic performance, however, prevalent concern about flagging test scores and meeting the needs of an increasingly diverse student population prompts further interest in such topics as Matthew Harris' 2010 dissertation titled *Impactful Learning Outcomes of One-to-One Laptop Programs in Low Socioeconomic Schools*. Harris conducted a multiple case study of five programs seeking specifically to understand what particular benefits that laptop access provides for poverty-stricken students. Through interviews, surveys, and on-site observations, Harris determined that laptop access "transforms scholastic learning, changes

the learning environment, increases students' technology skill set, impacts communication, and develops responsibility" (Harris, 2010, p. 175).

Based on his findings, Harris concludes that poverty-stricken students and their families have "the most" to gain from access to 1:1 laptop programs; such programs, he asserts, are thus an effective investment for schools and systems serving lower socioeconomic student populations. Interestingly, he also cautions that the value of 1:1 computing is compromised when it is not combined with both effective teachers and motivated students. In the planning phases, then, an assessment of the school culture and professional development needs must be given serious attention to ensure a successful implementation and subsequent student gains.

Uniting themes of writing, computing, and student success is Trishena Neivean Phegley's *Complicating Notions of Access: Class, Computers, and the Composition Student* (2005). This study focused on first-year college writers and the ways in which writing support programs could better serve their varying needs. Through student surveys, teacher and student interviews, and an examination of existing evidence in writing support program settings, Phegley explored the idea that students of lower socioeconomic status often view the computer as smarter than they are and subsequently "trust" it more readily than their advantaged peers; this belief manifests itself clearly in students' writing process when they rely strictly on grammar and spell check functions to revise their writing, thinking that because they have typed in their work and the computer has performed those cursory operations, their draft is of acceptable quality. Phegley notes that students of higher socioeconomic backgrounds tend to retain ownership of their work and are more likely to

view the computer as a tool to manipulate information as they see fit. Still other students mistrust the computer, believing that because their work looks nice when it is typed, it is seemingly hiding a myriad of weaknesses; these students view computers as "hampering creativity."

Through an in-depth exploration of student-computer dynamics, Phegley contends that there is a valuable correlation between a student's idea of the role of the computer and that of student's ownership of his writing. She offers recommendations that include addressing inequities in access for students, responding to a need for teaching students how to think critically and use technology while concurrently giving students ample time to explore. Phegley further advocates investigation on ways in which technology informs writing pedagogy and its role in a student's development as a writer. In addition, she encourages a study focusing on the dynamics of learning about technology in the home.

Reforms in Writing Instruction and the Impact of One-to-One Programs on Practice

Some researchers including Zhao and Warschauer (2010) speculate that the greatest impact of 1:1 environments can be seen in the area of writing. This is likely why laptop programs were initiated in Ireland, Indiana, and North Carolina specifically to improve student writing (Lei, Conway, & Zhao, 2008). Maine's statewide laptop initiative offers perhaps the most compelling evidence of the program's potential with exciting findings from a recent study of middle grades writing achievement. As early as 2001, the state began distributing 16,000 laptops to seventh and eighth grade students at a cost of $120 million. In 2009, a team of researchers compared 2001 writing scores for students prior to the initiative and scores from 2005, when the laptops had been in place for three to four years. The team

discovered that the average achievers in 2005 outscored two thirds of all students tested in 2001. In addition, the team researched how the laptops were being used specifically as part of instruction on the writing process with school-based teacher and administrator surveys. Through careful analysis of test results and school program surveys, the team discovered that the average student in the Best Use Group category scored better than approximately 75 percent of the students in the No Use Group (Silvernail & Gritter, 2009). Considering the marked improvement in scores and usage survey results, researchers confidently attributed at least a portion of the increase to the use of laptops in a 1:1 setting.

Should good writing thus become the quintessential 21st century skill, as the 2009 *Writing Between the Lines* report by NCTE boldly suggests, then a handful of achievement studies and user surveys will not suffice to justify potentially costly innovations such as 1:1 laptop access without a solid understanding of the research on quality writing instruction and its evolution in conjunction with technological applications.

We know now, for instance, that there is a distinct difference between teaching writing and assigning it. While this may seem subtle at first glance, much of what was passing for writing instruction in far too many classrooms during the 20th century was more akin to assigning writing tasks as opposed to teaching the writing process. Students were assigned a paragraph response, an essay, or a paper, and they were then sent home to write it. Some students visited the library during class and conducted research on their topics, perhaps even recording facts on notecards and making an outline of how they planned to organize the content of their paper. Even so, the processes of brainstorming, exploring ideas, drafting, revising, and editing were rarely discussed, much less given appreciable coverage during

scheduled class time. Practices including modeling the process and addressing the students' struggles or challenges in a whole-group setting were relatively rare.

In addition, the typical classroom setting arguably presented certain challenges for effective writing instruction. Such obstacles often included limited resources for gathering background information, difficulties for students associated with revising their handwritten work, and dilemmas of managing poor handwriting habits or fatigue from writing for extended periods of time (Warschauer, 2006). Emig's seminal research (1971) concerning the composing processes of high school seniors unearthed compelling humanistic data that indicated traditional writing instruction could actually be harmful for students. Such practices as not allowing ample time for pre-writing, harsh grading of draft-level pieces, and a general lack of opportunity to practice led Emig to conclude that for struggling or even average students, most writing instruction at the high school level was simply too advanced.

Langer and Applebee's research in the 1980's largely confirmed Emig's findings, indicating that students in most secondary English language arts classrooms did not write as often or at the depth and length that they should. They asserted that writing is most productive when it helps students gain knowledge in preparation for new activities, review and merge information already understood, and reflect upon and add to the experiences they have in class (Langer & Applebee, 1987). Hillocks' (1986) extensive meta-analysis of two decades of writing research in the mid-1980's further confirmed the futility of many practices found in the traditional writing classroom. His recommendations included student practice in sentence construction and combination exercises and the process of having students judge and revise writing according to pertinent criteria. Hillocks also observed that when

prewriting was used as inquiry for students, it was 2.5 times more effective than merely reviewing writing models. This finding, among others cited elsewhere in this review, reflects and reinforces the importance of understanding the difference between teaching writing and merely assigning it for completion.

The National Writing Project (NWP), a federally-funded program providing quality writing instruction and experiences for teachers at nearly 200 sites across the United States, offers compelling recommendations for quality writing instruction as well with its publication of *Because Writing Matters* (2003) and more recently, *Because Digital Writing Matters* (2009). With close to 40 years of experience inspiring project participants to teach writing effectively, the NWP cites several noteworthy points concerning writing instruction: 1. learning to write requires regular, scaffolded practice with diverse writing tasks that feature authentic purposes and genuine audiences, 2. teachers must explain to students how to organize elements of their thinking, brainstorm ideas, and make changes necessary for reader clarity in addition to engaging them in solving challenges, reflecting, critical thinking, and imagining; and 3. teachers must utilize a variety of techniques to improve students' writing (Nagin & NWP, 2003).

Looking more broadly, the school setting must have 1. Leaders and teachers who comprehend, appreciate, and practice writing themselves, as well as have professional development opportunities in teaching writing available to all faculty; 2. shared expectations for writing across grade levels and subjects; and 3. fair and authentic assessments characterized by high standards and reflective of student progress (Nagin & NWP, 2003). Adding to these criterion, we see that school communities that commit to teaching students to

plan, draft, and revise in a self-regulated manner experience noteworthy strides in writing improvement (Graham, 2006). Greater quality of writing occurs as well when students are given choices about their writing and interesting writing tasks. In addition, student writing should be displayed prominently in classrooms and throughout the school to enhance the sense of audience (Graham, et al., 2007).

Gersten and Baker (2001) add to these suggestions based on their meta-analysis of 13 studies with learning disabled students to assert that a quality writing program for special needs students includes specific instruction in each step of the writing process, coverage of the various distinctions among writing genres, and scaffolds for providing meaningful feedback to students on the quality of writing from both instructors and fellow students. Pritchard and Honeycutt's (2006) review of studies evaluating the impact of the writing process on K-12 students and how writing is taught supports Gersten and Baker's criteria as effective for regular education students as well.

In a related study, Honeycutt (2002) analyzes the impact of specific instruction and practice in utilizing writing process strategies. Pre- and post-tests of writing workshop participants in the study demonstrated that the quality of their writing improved when they instinctively employed specific strategies for prewriting, writing, and revising; independently monitored the development of a text, and implemented techniques for handling unproductive emotions that arise during the composing process (Honeycutt, 2002). Based on these and other studies, Prichard and Honeycutt (2006) conclude that effective aspects for teaching writing include attention to revision, the development of positive attitudes and social interactions, and opportunities for problem solving. Pritchard and

Honeycutt further assert a need for additional exploration of these areas in qualitative and quantitative research.

Kirby, Kirby, and Liner's *Strategies for Teaching Writing* (2004) offers additional practitioner and experience-based recommendations for effective writing instruction, advocating above all that ample classroom time must be devoted to writing, talking, and sharing rather than lecturing, how-to talks, and extensive grading. This assertion aligns well with Yancey's notion that teachers strive to embrace and understand the way that students communicate and write with opportunities to engage in the reflection process and to maintain electronic portfolios for continuous practice and improvement (Yancey, 2009). Warschauer (2005/2006) engaged in a two-year multiple case study of the impact of 1:1 access on academic literacy skills in three Maine and seven California schools serving diverse students in grades 3-12. Based on 750 hours of observation, a survey of over 1000 members of the school communities studied, and interviews with over 200 teachers, students, parents, and administrators, Warschauer's team concluded that students given ubiquitous computer access tend to engage in more background research activities, write, revise, and publish in increasing amounts, obtain more feedback on their written work, write in increasing varieties of styles, and produce higher quality written products. With such tools at the ready, it is not surprising that students in 1:1 settings often show considerable growth in the quality of their writing over time.

Warschauer's (2009) later research reflects that laptop access has the potential to impact writing instruction at various stages of the process. For prewriting, students can access the Internet to obtain background information as well as utilize graphic organizers to

order their thoughts. Essay planning templates, software for converting diagrams into outlines, and question prompts that transform short answer responses to essay text are among the tools currently in use in 1:1 settings.

According to Warschauer (2009), students also prefer laptops for writing drafts. They found keyboarding physically easier than writing with a pen or pencil, though admittedly some students with poor keyboarding skills struggle to complete assignments at times. By and large, however, students appreciate having scaffolding tools such as spell checkers, grammar guides, and dictionaries to aid in their writing along the way. In addition, they are able to write faster and produce longer texts.

Warschauer (2009) also observed that during the revision stage, students find laptop access helpful for moving text with ease, providing and receiving feedback from peers and the teacher, and for turning in a quality product that is easy to read. As students move into the sharing phase of writing, they enjoy being able to choose a specific format for self-expression, as well as to remain anonymous when they feel so inclined. Since the students' writing is often for an audience that extends beyond the teacher, the students are typically motivated to take more time with their work and aim for greater accuracy.

Considering the variety of meaningful ways in which Warschauer's extensive study demonstrates that 1:1 access impacts writing process, it comes as no surprise, then, that in successful ubiquitous settings, student writing becomes "better integrated into instruction, more autonomous, more iterative, more public and collaborative, more purposeful and authentic, and more diverse in genre, while students' written products improved in quality" (Warschauer, 2006, 110). These are certainly worthwhile goals for any teacher of writing.

MacArthur (2006) sees perhaps a more potent application for students in 1:1 settings in a meta-analysis of studies focused on writing in the context of elementary and secondary settings. Based on his review, MacArthur suggests that computers empower students as producers of writing rather than merely consumers of text. While this distinction may seem a subtle shift on the surface, the implications are noteworthy. With 1:1 access, MacArthur's meta-analysis reflects that students have the potential to transcend from merely taking in information to creating it and, subsequently, sharing it with a wide audience. MacArthur's findings also assert that communication with peers – in class and online – may cause students to think more carefully about their audience and to be more explicit and elaborative in their writing.

Douglas Grimes further explores the impact of 1:1 computing on middle school writing instruction in a 2008 dissertation study at the University of California, Irvine. Looking specifically at the influence of teachers' utilization of an online program to score student essays on writing behaviors and achievement at eight Southern California middle schools, Grimes examined transcripts of teacher interviews he had conducted as well as classroom observations, teacher and student surveys, sample essays, administrator reports, and student writing scores to draw several conclusions. Chief among these is the idea that the program's results depended on local conditions more so than one might initially imagine (Grimes, 2008). Some schools experienced commendable results using automated scoring program, while others saw little, if any, noticeable impact on achievement. Teachers commented that transitioning to the use of automated writing evaluation was easier than

integrating a new textbook, though sustaining the evaluation tool proved more expensive than the funding associated with a new textbook adoption.

Grimes also reports that teachers found that the automated writing evaluation program increased their students' motivation and autonomy. The program aided differentiation efforts and was found to be most effective with teachers who took the time to experiment with the program, include it in their regular writing plans, and collaborate with their peers on successful strategies for implementation. As a result, Grimes recommends that districts with progressive teachers will fare better with such initiatives than those with teachers who are unmotivated or unwilling to commit to a need for writing instruction reform. In this vein, he reiterates the time-honored idea that a school's teachers are its greatest resources. As a final note, Grimes cites the need for a reliable technological infrastructure based on his discovery that teachers who did abandon their use of the automated writing evaluation resources did so out of frustration with network difficulties.

Gregory Ulmer (2011) also explores the role of technology's impact on writing and communication with his ideas concerning *electracy*, a term defined as "the kind of skill and facility necessary to exploit the full communicative potential of new electronic media" (Wales, et al., 2011, p. 1). Ulmer asserts that society's movement from a literate to an electronic culture inspires "changes in the ways that ideas are created, written, and exchanged" (Wales, et al., 2011, p. 1). In a 2011 talk at the University of Florida, Ulmer explores the means by which technology use impacts identity development and the creativity process. He laments that schools are not capitalizing on their potential to enhance this skill

set, comparing the separation of church and scientific learning in the Middle Ages to the lack of "electracy learning" in schools today (Ulmer, 2011).

Schools with 1:1 programs, however, are working to address digital literacy or new literacies, related terms that describe the skill set required for success in an increasingly technological environment. Specifically, digital literacy is defined as

> the awareness, attitude and ability of individuals to appropriate use digital tools and facilities to identify, access, manage, integrate, evaluate, analyze and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process. (Martin, 2006, p. 2)

Hobbs (2011) further describes such literacy as a process that involves five fundamental communication skills for learning in all subject areas. These include abilities to access, analyze, create, reflect, and act. Writing is a natural offshoot of these activities. Hobbs subsequently recommends seven core instructional techniques to build digital literacy in 1:1 settings. Of the seven, those specifically emphasizing writing include authoring a media diary, multimedia composition, and cross-media comparison. When educators work to promote students' online text production as both positive and creative (Carrington & Robinson, 2009), the children's opportunity to develop digital literacy flourishes, as does their ability to grow as effective communicators. This is ultimately beneficial for both students and teachers as the classroom environment continually evolves with new literacies and accompanying technologies to engage with them.

Gaps in Existing Research

While many 1:1 laptop programs are still in the planning and implementation stages in some schools and districts, other initiatives have been in progress for well over a decade now. As a result, there is considerable information concerning the viability and value of such programs as a result. While a review of the literature consistently reveals increased student engagement and motivation, progress in academic achievement for a variety of student populations, and strides in teacher enthusiasm for ubiquitous laptop use, several questions remain largely unexplored.

For instance, we see reflected in several accounts that writing process approaches are better utilized by students, the quality of student writing is enhanced, and writing achievement scores increase with appropriate use of laptops for classroom writing instruction, yet there is still not a great deal of information concerning the ways in which teachers provide writing instruction in the 1:1 laptop environment or how students think through various stages of their writing process in such settings. The National Council of Teachers of English posits that while trends in technology use contribute to the idea that writing is more important than ever, current studies indicate that time set aside for writing instruction as well as research concerning writing evaluation have diminished in the last decade (NCTE, 2008). An investigation into the ways that teachers engage in writing instruction in 1:1 laptop settings would thus add meaningfully to the existing knowledge base.

Though there is some disagreement among researchers and study findings as to the effectiveness of technology applications for long-term student achievement, promising

preliminary results from various laptop programs across the country assure that 1:1 computing environments will likely continue to gain popularity as a means of preparing students for the challenges of global citizenship and a perennially-evolving career world. Further research concerning ubiquitous computing for students and their teachers, particularly in specific content areas such as writing, is thus a wise investment of time and effort. Should this indeed be *The Age of Composition* as Yancey (2009) has suggested, we would be remiss to do otherwise.

Conclusion

One-to-one laptop programs now thrive in many school systems. Preliminary research looking at the effectiveness and achievement for student participants in the programs is generally positive, though there are clearly certain steps to be taken and processes to undergo to ensure a greater chance of success. Research on effective writing instruction using technology has been promising as well. Yet, there remain several unknowns about laptop learning in specific content areas. In the area of English Language Arts specifically, questions remain about the evolution of teachers' writing instructional choices and student perceptions of themselves as writers in light of ubiquitous computer access.

To offer context and support for the nature of the proposed study, this chapter has provided a concise history of 1:1 laptop programs and subsequent research findings concerning essential components for success and student achievement. In addition, professional development needs for new and experienced teachers as well as student benefits related to ubiquitous computing have been discussed. Delving still further, the review

includes the integration of technology into writing instructional practices, detailing what we currently know and understand about effective writing instruction, and ends with a discussion of gaps in the existing literature. The next chapter describes the research methodology of this study.

CHAPTER THREE: METHODOLOGY

Background

As technology plays an increasingly vital role in our lives, we need to understand more keenly the impact of electronic tools for learning so as to prepare our students for their future. Considering that written communication is taking greater precedence in personal and professional arenas in the form of email, webpage development, blogging, texting, and other various means of establishing and maintaining an online presence, it is of dire importance that students have ample practice and competence in writing. The purpose of this research, then, is to offer a detailed multiple case study of instructional practices for writing in 1:1 laptop settings.

While some research is available concerning the achievement potential for student writers in 1:1 settings as well as various tools and activities conducive to such a setting, relatively little has been written to date that focuses on how routine aspects of writing instruction have evolved with ubiquitous computing access. Conducting research of this nature thus involved gathering information about teachers' understanding of both effective writing and pedagogical strategies as influenced by their students' 1:1 access and how instruction is subsequently delivered. To offer further insight, this study also explored students' perspectives of their writing lives with ubiquitous computer access. Gathered information included teacher interviews, classroom observations, lesson plans, student writing, and student focus group discussions.

This chapter details the research inquiry and methodology process utilized to conduct the study. The lead research question, "How are teachers' pedagogical strategies for teaching

writing influenced by their students' 1:1 laptop access?" guided the investigation. Additional sub-questions that supported the primary question were as follows:

1. What challenges do teachers and students experience concerning writing in 1:1 laptop settings?
2. How has 1:1 access changed the nature of writing activities and the use of instructional time for the writing process?
3. How do 1:1 environments impact student writing process?

Research Design

In looking at potential methods of investigating writing in middle grades English language arts 1:1 settings, a qualitative approach best suited the topic as it permitted an in-depth exploration of the many layers and complexities inherent to classroom teaching and learning. Denzin and Lincoln (2005) assert that qualitative researchers investigate people and things in their natural environment so as to gain a greater understanding of what is being studied and the significance that people bring to it. There is much valuable knowledge to be gained, as a result, in talking directly and at length with teachers about writing instruction and activities influenced by their students' 1:1 laptop access. As practitioners, teachers can shed the greatest insight on the inner workings of the 1:1 classroom. Focus group discussions with students added a fresh perspective and insight that is relatively rare in existing research on writing.

Delving still further, Creswell (2007) recommends employing qualitative research when an issue needs to be explored, when we need a complex, detailed understanding of the

issue, or when we want to empower individuals to share their stories. Writing instruction as part of a 1:1 laptop program met the stated criteria; after all, we live in a time when schools are increasingly looking at various means to integrate technology, and both teachers and administrators benefit from detailed information and personal accounts of individuals who have experienced the programs being considered. Qualitative data inspires the researcher's focus on faithfully describing what is observed in the setting and detailed in the interview process. Qualitative researchers aim to depict accurately the issue and draw appropriately-substantiated conclusions where possible.

In looking at the best qualitative approach for this research proposal, case study lent itself well. According to Merriam (1988), Stake (1995), and Yin (2009), a case study offers a comprehensive analysis of one setting, a solitary subject, or one singular event. Stake asserts that researchers are responsible for helping their audience to acquire an excellent understanding of the case study described so as to enhance the meaning-making, taking into account personal experiences and interpretations of the text. When done successfully, the greatest amount of learning takes place for both the researcher and the reader. This outcome of meaningful learning for both the writer and subsequent audience aligns well with the overarching purpose of qualitative research.

Yin notes, however, that single studies should be reserved for unique or unusual situations, favoring instead multiple case studies when they are available to strengthen one's research findings. This study thus focused on five teachers employed at middle schools in two North Carolina school districts. The primary means of data collection involved teacher interviews, classroom observation, student focus group discussions, and a review of

appropriate documents including lesson plans, assignment or activity sheets, student writing samples; these activities comprise the bulk of the data, with an emphasis on an intrinsic, explanatory style of description.

After all, vivid and detailed description as to how writing instruction and the various steps of the process unfold in 1:1 settings as explained by the local experts and closely observed for meaningful analysis has the potential to add considerably to the existing knowledge base. McNabb noted in the *Journal of Research on Technology in Education* (2005) that researchers would be providing a "great service by addressing the deeper issues of technology use in specific content areas" (p. 117). Partnering with teachers to investigate the inner workings of classroom instruction in 1:1 settings thus shed important and valuable light on a little-explored area.

In considering laptop learning, modern educators must concede some degree of truth in Wichita Falls, Texas, Curriculum Technology Coordinator Jackie Deluna's (2006) notion that technology makes learning more meaningful for students when they learn through real-world tasks. Successfully carried out, writing instruction in the 1:1 laptop program can be a powerful means to accomplish this goal, and studying such instruction provided a worthwhile learning resource for educators.

Site Selection & Sampling Criteria

Creswell (2007) reminds investigators that care and effort must be taken in selecting potential sites for multiple case study research. Too few sites can lead to weaker reliability of findings (Yin, 2009), while too many sites contribute to less depth for each case (Creswell, 2007). The sites for this study were thus five middle grades English language arts

classrooms in two small, rural North Carolina school districts. The first site, in Eastern North Carolina, has provided its grades 6-12 students and teachers with 1:1 laptops for nearly a decade. The system now notes that the vast majority of its high school graduates attend college. This assertion, combined with the system's 10 years of experience engaged in laptop learning, readily lends one to believe that the teachers and students involved have considerable potential for sharing valuable information concerning writing instruction and practice.

The second site, located in the southwestern part of North Carolina, conversely, does not boast the same depth of experience as its Eastern NC peers, having started its laptop program for students in grades 4-12 more recently in 2008. Yet, preliminary achievement results have garnered national attention, with graduation rates soaring to 91 percent, 89 percent of students performing at or above grade level, and test scores that now rank among the top performing in the state (Schwarz, 2012). What is being viewed as a modest investment - $1.1 million each year for the MacBooks and accompanying resources – has yielded enviable results in many districts spending far more money on student learning initiatives.

In considering study particulars, Stake (1995) asserts that case study data sources should include the people and places that best aid our understanding of the case. With two established 1:1 schools selected for the study, the participants thus included five fully-credentialed middle grades English language arts teachers– three at the Eastern North Carolina site, and two at the Southwestern North Carolina school – and two groups (one at each school site) of heterogeneously-arranged students culled from among three selected

teachers' classrooms for focus group interviews. As would be expected, the teachers, all of whom were selected by their principal based on my initial request criteria, were not novices to 1:1 writing instruction; rather, they had two or more years of classroom experience in addition to professional development opportunities as part of the requisite implementation program. This criterion enhanced the potential for classroom activities to focus on pedagogy and content as opposed to behavior management, which studies repeatedly show that beginning teachers spend considerable time handling. With experienced teachers, the focus for the observations, then, was on 1:1 English language arts classrooms with a greater percentage of time devoted to academic tasks.

Additional participants in the study included eight students as part of two focus group discussions, one with three students at the Eastern North Carolina school, and a second at the Southwestern North Carolina school with two students, and three additional individual students interviews at the Eastern North Carolina site. There were four Caucasian males, one Caucasian female, two African-American females, and one African-American male included, for a total of six students interviewed at the Eastern North Carolina site, and two students at the Southwestern school. Careful attention to balancing students of gender, ethnicity, socioeconomic status, and academic standing ensured that a variety of perspectives were fairly represented. Students came from poverty-stricken and single-parent settings as well as homes in which one or both parents held advanced degrees. This level of inclusion added depth to the findings by giving voice to the diverse assortment of students served in our schools.

Data Collection

Data collection for the study was thorough so as to satisfy the necessity for rich and accurate description. Personal interviews (Appendix A) with each of the five selected teachers, all of whom were females, with one African-American and four Caucasians comprising the selected population, took place shortly after the first classroom observations to build rapport, unearth key themes, and allow for the elaboration of vision and areas of expertise. Each interview was digitally-recorded in the teachers' classrooms either during an available planning period or after school depending upon each one's preference, with the average recorded length at about 15 minutes per participant. Ensuing transcriptions, copies of related lesson plans, teacher-developed materials, and student writing samples were collected and closely examined so as to aid in triangulation.

One focus group of students at each school site was conducted once the teacher interviews and at least one day of classroom observations had occurred. Selection of the students for the digitally-recorded group discussion took place randomly, though with the participating teachers' assistance to assure diversity of ability, background, and other general demographics. The intent was to have the students discuss their experiences (Appendix B) as writers with ubiquitous computing access. Two focus groups were included so as to assure the inclusion of as many diverse student voices as possible at both sites. Such topics as personal preferences and challenges concerning laptops and writing, motivation to write, and specific approaches to writing process were explored so as to gain a greater understanding of the students' perspective on writing instruction and practice.

In addition to assuring thoughtful diversity, teacher input and observer experience with the students as they used their laptops regularly aided in the development of pertinent follow-up questions posed for each focus group based on the students' responses to the planned questions. Such an interview protocol added an invaluable element to the study considering that we typically find research emphasizing ample opinions of adults in an academic setting when what might be particularly beneficial, but is all too often lacking, is the student perspective.

The study included 26 hours of observations of the five teachers and their students in the classroom setting over three days at the Eastern North Carolina site and two days at the Southwestern North Carolina school site. Approximately five hours were spent observing each teacher, most of which took place as an unobtrusive observer, with some opportunities to observe student work first-hand by walking around the classroom. The focus of the observations emphasized students as they learned and moved through their writing process as well as the teacher's writing instruction utilizing the laptops, the lessons as they unfolded, and finally the ways in which students responded. Copious field notes were recorded via laptop computer throughout the observations to assure accuracy of representation and thick description of the classroom setting. Each teacher's interview responses combined with the students' focus group discussions after the classroom observations shed light on the inner workings of a 1:1 writing environment. Artifacts including each school team's unit lesson plans encompassing the days of the visit, nine student activity handouts, two samples of student writing, and detailed field notes describing student and teacher activity during each of the five days of classroom visitations provided additional sources for capturing the full

picture of teaching and learning in the observed settings. In addition, the researcher recorded reflections at the conclusion of each of the five days of onsite activity and after each interview and focus group discussion. These reflections later served as reminders of the researcher's immediate impressions of teachers, students, and classroom activities.

Data Analysis

Yin (2009) advocates that observations of curriculum in action provide "invaluable aids for understanding the actual uses or any potential problems being encountered" (p. 110). As laptop learning becomes increasingly commonplace, there is a need for detailed resources that reflect close analysis of effective instruction in these settings. A study of writing instruction as it takes place in the 1:1 learning environment provided the opportunity for close analysis and the subsequent collection and exploration of insightful data that few recent research endeavors have examined.

In undertaking the investigation of artifacts as part of a study, Yin (2009) notes that high quality data analysis attends to all the evidence, addresses all major rival interpretations, discusses the most significant aspects of the study, and reflects the researcher's own prior, expert knowledge. Among the methods researchers use to accomplish robust data analysis are pattern matching, explanation building, and cross-case synthesis (Yin, 2009). To assure robust data analysis for this study, the interviews, document collection, and observations were completed at both sites, and all information was entered into the computer, printed, and subsequently scrutinized over a period of several weeks. With a focus on Geertz and Ryle's *thick description*, digitally-recorded interviews of teachers, individual students, and focus group discussions were transcribed by hand and read closely five times or more with

informal note-taking before subsequently being open-coded using the theoretical framework known as TPACK as cited in Chapter Two. Areas of TPACK include technology, pedagogy, and content area knowledge as well as the intersections among these areas, which include technological content, pedagogical content, and technological-pedagogical knowledge.

As familiarity with the teacher, student and focus group transcriptions increased over time, efforts were made to identify common threads and overarching themes as well as noteworthy variations among the accounts. Careful review of transcriptions, field notes, and artifacts provided opportunities for pattern matching. After thorough analysis, reflection, and concerted note-making, it became possible to sort data results to align with the proposed research questions and further delineate prevalent themes among the data.

Digital resources including Microsoft Word and Excel aided in the organization, maintenance, and examination of data. Use of the *find* function of MS Word confirmed the presence of oft-repeated phrases among the transcripts and field notes, which were first observed by careful reading. Excel was then used to store the phrases as they were logged so as to have a convenient location for later review and reflection.

Of particular interest in this process were recurring phrases and themes among the five teacher transcriptions concerning pedagogical strategies and beliefs concerning practice, as well as constant comparisons of transcribed discussions between the two student groups and individual student interviews for common threads. As significant patterns emerged from the readings and digital scouring of the data, they were noted, stored in Excel and later organized into themes, which were subsequently narrowed as the process unfolded to reflect overarching patterns seemingly encompassing them. Plausible explanations for overarching

themes informed by the literature and the researcher's experience were explored informally and are later described in Chapter Four.

In addition to interview transcriptions, other supporting evidence including ancillary teacher materials (lesson plans, self-generated activities, etc.), student writing samples, and both observation and field notes were analyzed for patterns, recurring themes, and explanation building to support existing impressions from teacher, student, and focus group transcription review. As findings emerged from careful scrutiny of the data, any relevant rival interpretations were sought in the existing literature and addressed as the most meaningful elements of the study were explained.

Follow-up with each of the teacher participants for clarification occurred so as to assure accuracy of given information. Each of the five teachers responded that the information gleaned from the interviews was accurate. In addition, sensitivity to the researcher's stance as an experienced English language arts teacher new to the 1:1 learning environment was maintained throughout the process through the use of frequent personal reflection, informal note-taking to record personal responses to the data, and feedback from colleagues. These measures were taken to deter the potential of the researcher's perspective both to detract from and to overly enrich analysis procedures and subsequent reporting efforts.

Research Validity and Reliability

Research validity implies that one's methods and results are both verifiable and trustworthy. Those choosing a qualitative approach, then, must adopt purposeful means of assuring that their results speak accurately to the experience they are striving to convey.

Suggested means of accomplishing this goal include prolonged engagement in the field, triangulation, member checking, and thick descriptions (Creswell, 2007). To achieve research validity, this study featured close to 30 hours of first-hand engagement in five middle grades English language arts classrooms at two distinct 1:1 laptop school settings. Thick descriptions of the five teacher participants, eight students, their five classrooms, and the two school settings were provided. In addition, triangulation of data among interviews, focus group discussions, observations, and relevant document analysis was conducted. As a final step, member checking of the final transcript for each of the five teacher interviews was utilized for individual interview participants to ensure accuracy of researcher interpretation.

Though reliability is typically used in a variety of ways among qualitative researchers, Bogdan and Biklen (2007) suggest that consistency relates more readily to the precision with which the research site and participants are depicted as opposed to the researcher's interpretation of the findings in regard to existing theory. The aim is to better understand people, their behaviors, and their experiences.

Attaining reliability during this study, then, involved triangulation of data among interviews, focus groups, document analysis, and observation data. The focus remained steadfast: accurately sharing what was "seen" rather than launching into elaborate theoretical connections or personal conjectures concerning the data. This was a crucial step for protecting the validity and trustworthiness of the study. After all, much can be gained simply by describing first-hand writing instruction as it is carried out and subsequent student activity in response in 1:1 settings. For many practitioners and researchers, gaining the students' thoughts on writing and understanding how they articulate their journey as writers

with ubiquitous computing access may well be their first exposure to the inner thoughts of teachers and adolescent learners navigating exciting, yet relatively uncharted territory.

Subjectivity Statement

As a one-year veteran to the 1:1 setting, this study is obviously of great personal interest, but perhaps not for reasons one might initially assume. In life, most everyone can identify something or someone in life with which he or she has a love-hate relationship. For me, that something is technology. As a child, I have fond – if not perplexing – memories of programming a dot to bounce across a television screen using a chocolate-brown Commodore 64 computer and later of being enthralled with a critical thinking game called *Zork* on the Apple computer in middle school. In high school, I thoroughly enjoyed my freshman *Introductory Typing* class and later enrolled in a math and science camp where I worked on an independent computer project to forecast the ballistic trajectory of fireworks. More recently, I have embraced email and Microsoft word as two of the finest inventions ever to grace communication in the school world.

Despite these techno-centric behaviors, I rarely use a cell phone, do not read books or lengthy texts online, have no I-Pod or I-Pad, nor did I value the convenience of a Blackberry when serving as a school principal. Technology "does not come easily to me" as someone near and dear recently explained it. Yet, I persist and continue to try to incorporate modern tools and software applications into my teaching because my instinct says it is the right thing to do for young people. After all, they are digital natives as Marc Prensky coins them in his 2001 article, *Digital Natives, Digital Immigrants*. As a digital immigrant (having been born a few years shy of the late 1970's, Prensky's cut-off for digital natives), I must actively work

to tailor curriculum content and activities to suit the learning needs of a student with life experiences quite different from my own.

A stance of this persuasion is not easy, so when 28 sixth grade students bounded into my language arts and literature classes last year with laptops in tow, raring to continue the great digital learning journey they began the previous year in a self-contained fifth grade setting with a youthful techie teacher, I wondered if we were in for an educational version of *Mission Impossible.* I wanted to make their learning experience as meaningful as possible, but four or so hours of training left me feeling woefully inept. I had a few resources and some ideas, but no first-hand experience unleashing the Internet giant to every student in my own classroom at once.

Looking back on our first year together in the 1:1 setting, I can readily identify my mistakes – there were several – as well as our triumphs, of which there were a few. By June, I was no longer too busy to ignore the recurring feeling that 1:1 access in the language arts classroom could be much more greatly utilized. I sought information specifically for teaching writing in a ubiquitous computing environment and was surprised to find relatively little available. This was particularly troubling because all 90 of my middle school students arrived last fall with laptops in hand. One group of students, our eighth graders, were new to ubiquitous computing access, while the younger grades had considerably more experience. I wanted – and needed – to be able to provide all of my students with highly-effective 1:1 instruction and guidance to make the best use of our time together.

At this point, it would be easy to assume, then, that a lack of technological prowess was a potential disadvantage concerning the study; however, my expectation was that it

would instead be beneficial in terms of the learning potential. Lankshear and Knobel (2006) assert a need for insider research that investigates those involved in new media by researchers who are also immersed in them; this aptly described my present status as a professional. A self-professed deficiency in technology talent should render my findings accessible to a wide range of educators as well as offer a comprehensive perspective for technology-infused language arts instruction in the middle grades classroom.

To guard against bias, Herr and Anderson's (2005) description of triangulation as the inclusion of multiple perspectives and the use of a variety of methods so as to avoid being limited to one specific data source reflects the importance of accumulating data from various sources as well as conducting observations and document analyses where possible. Therefore, I included five teachers responsible for multiple classes that I spent 26 hours observing over a two-to-three day period; in addition, eight student participants in interview and focus group discussions further permitted access to a rich collection of perspectives. This determination, in turn, served to engender as accurate a depiction of writing instruction in 1:1 settings as possible given the constraints of time and location previously noted.

To control still further for the impact of my subjectivity, I followed up with each of the interview participants via email with a copy of the transcribed interview data and an invitation to share any additional information or concerns once the information was prepared. It was important to ensure that I correctly surmised and recorded their experiences as they intended. These member checks allowed for ample access to the participants so I could fully understand their perspective and experiences and subsequently report them with accuracy.

Ethical Considerations

Potential ethical issues related to the study included the ease with which the schools could be recognized based on their description, thereby inadvertently identifying the teachers and students involved. Pains to assure confidentiality and anonymity were important elements of the study, particularly for the participating teachers so they did not feel intimidated or somehow required to act a certain way perceived as pleasing or beneficial to the nature of the study. Honest feedback was naturally essential to assure a quality study.

In addition to addressing identity concerns, I did not want students and families to worry about privacy issues, so extra steps were taken to address participant anonymity. To contend with the possibility that students selected for the focus groups would feel coerced to participate, or perhaps as if they had to say certain things so as to be perceived as being supportive of their teacher, selected students and their parents were reassured that their answers would be kept anonymous. This assurance increased the students' comfort in participating and their parents' willingness to grant consent for inclusion in the study. There were no difficulties completing this step, aside from the fact that some students at the southwestern North Carolina site forgot their permission slips and were unable to participate. Thankfully, there were enough back-up participants available to meet the original goal of eight students for inclusion. The value of first-hand student input cannot be overstated, so every effort was made to assure each student's comfort throughout the process. Finally, clarifying expectations concerning these areas so as to avoid misunderstandings was a valuable proactive step that resulted in clarity and a smooth interview experience.

Limitations of the Study

Perhaps the most obvious limitation of this study is its small sample size. A multiple case study of five teachers and eight students, no matter how robust, cannot expect to inform major policy or inspire sweeping changes to instructional practice. Nonetheless, Stake (1995) firmly asserts that the value and utility of one's research is not based on its reproducibility so much as the meanings that are made by both the researcher and the reader (Stake, 1995). This study thus strived to engender considerable meaning for its readers.

A related limitation to note involves the amount of time available for the study. Because of the location of the schools in relation to the researcher's home, three days were allotted to the Eastern North Carolina site and two days for the Southwestern North Carolina school site for observation and interviews, with one follow-up contact once the data were available for member checking. This scenario did not permit in-depth observation as some more longitudinal studies demonstrate. Nonetheless, two-to-three days of observations in conjunction with pre-visit and post-observation emails, access to unit lesson plans, and detailed discussions with teacher participants and students enabled the researcher to gain a solid understanding of typical writing instructional practices for each classroom. In addition, the combination of artifact review, field notes, observation data, and interview and focus group transcriptions provided still further material for generating an accurate picture of the participants and instructional settings being studied.

In addition, the teachers and students who shared their perspective may not accurately represent the diversity of contemporary society. Due to the comparatively singular nature of the school settings being studied, one's ability to make reliable comparisons to vastly

different schools is called into question. There remains, however, a great deal to be learned from delving further into 1:1 settings to examine writing instructional practices and subsequent student activity. Naturally, the study does not fully address issues prevalent at all levels of schooling in every potential setting, though it is intended to offer insight into effective writing instruction for adolescents in the 1:1 setting. Drawing comparisons must simply be done with caution, as should be the case with most any study or setting.

A final limitation to note relates to researcher bias. As an English language arts teacher, it was imperative as an investigator to keep my personal perspective and beliefs about writing instruction in check as I engaged in the research process. Doing so ensured that my professional leanings and inclinations did not hinder or alter the findings from the study. With no comparison group or secondary researcher available to offer a balancing perspective, this step was important to assure the kind of high quality results that Yin (2009) remarks may "make a significant contribution to knowledge or practice" (p. 165).

Chapter Summary

In this chapter, the research design for the investigation of writing instruction in ubiquitous computing classroom settings has been described as a qualitative case study. Looking at how experienced English language arts teachers' pedagogical strategies are influenced by their students' 1:1 access served as the guiding research question with three related sub-questions providing additional focused means of discovery. Rationales for a multiple case study design with specific sampling methods involving teachers and students have been explained. In addition, methods for data collection and analysis have been described, as have plans for handling ethical issues and assuring research validity and

reliability. Limitations of the study have been clearly outlined with further elaboration on potential researcher bias in the form of a personal subjectivity statement. Chapter Four follows with detailed findings from the study.

CHAPTER FOUR: FINDINGS

Introduction

This chapter describes the qualitative data resulting from research undertaken to address the query: How are teachers' pedagogical strategies for teaching writing influenced by their students' 1:1 laptop access? A multiple case study structure was employed to discern relevant information. Study findings are thus organized first by the two cases investigated. These sections are then sub-divided into an introductory description of the various elements inherent to each study site as well as answers to the primary research query and three sub-questions according to teacher and student participant data. The sub-questions included 1) What challenges do teachers and students experience with writing instruction in the 1:1 setting; 2) How has 1:1 access changed the nature of writing activities and the use of instructional time for the writing process; and 3) How do 1:1 environments impact student writing process? Descriptions of participant data are provided in light of Mishra & Koehler's TPACK framework, which explores the intersection of a teacher's pedagogical, content, and technological knowledge.

The chapter continues with details of overarching themes that became apparent during cross-case analysis. The section ends with a summary of the findings inherent to both sites among all participants as well as a review of the chapter's content.

Multiple Case Study Details

This study featured two eighth grade and three seventh grade English language arts classrooms located at two middle schools in relatively rural North Carolina districts. To aid in accurately understanding and depicting each case study, five English language arts

teachers were interviewed and observed at the two sites (three at the Eastern NC school and two at the southwestern NC site) over a period of two to three days at each site. In addition, six students were interviewed at the Eastern North Carolina site, while two were interviewed at the Southwestern site. Documents including teacher lesson plans and handouts, student handouts, school improvement plans, and two samples of student writing were collected to aid in triangulation of the data. To provide appropriate and accurate details of each site in keeping with the goal of responding to the guiding research question and sub-queries, areas detailed in each case study description include teacher participants, student interview candidates, an overview of observation data, and documents collected.

Site One: Eastern North Carolina Middle School

Background.

The Eastern North Carolina middle school (ENCMS) enrolls approximately 800 students in grades 6-8. Nearly half of the school population is comprised of African Americans, while Caucasians account for 30%, and Hispanics the remaining 22%. Nearly 80% of the children in the community qualify for free or reduced lunch. The school, including the front office where a prominent sign on the wall informs students, “It’s not IF you go to college, but WHEN you go to college,” is currently housed in a series of modular units, the original building having lost its roof during a tornado in the spring of 2011. The students will return to the renovated facility for the 2013-14 school year. This site is one of six schools in the district, and the only school serving middle grades aged children in the county.

The school has provided Mac Books for its students since the fall of 2004. All students have access to their computers during the school day; with the purchase of accident insurance at a cost of $75 per year, the laptops can be taken home in the evenings and over the weekends for the duration of the school year. For reasons including limited finances, the presence of a desktop computer at home, and lack of parent support for computing, a majority of families at this school opt out of the insurance, rendering their children day-users of the laptops rather than having ubiquitous access.

Teacher Participants

Forty-five teachers comprise the staff of ENCMS. Grade level teaching teams have four instructors who rotate students among social studies, language arts, science, and math core classes that are 65 minutes in duration each. Upon my arrival, which was approved and planned at length via email communications five weeks in advance of my visit, I was provided with a schedule and directed to spend time with three seventh grade English Language Arts teachers. Interestingly, each of these three instructors arrived at the school seven years ago and have taught together since that time. The team meets each Thursday to plan their lessons using a template provided by the school district with weekly visits and feedback from North Carolina Department of Public Instruction support staff. In addition to these activities, the teachers meet with their seventh grade colleagues and the school-level literacy specialist weekly for training and other instructional support events.

Eastern North Carolina Middle School's day was arranged into four core classes of 65 minutes in length, one 30-minute lunch, and two 45-minute elective-style classes. I visited two each of the three teachers' scheduled classes over a three-day period. Ms. Smith taught

exceptional children's inclusion classes, and I observed two sections each day during my visit. Ms. Baker's students were considered traditionally achieving, and I saw two sections of her classes for two days in light of her absence on the first day of my visit. Ms. Young served an AIG-inclusion team, and I observed two of her classes during each of the three days that I visited the school.

Adding to the detailed schedule provided by the school principal, Ms. Young shared a copy of the ELA team's lesson plans that had been developed for the week of my visit. This document included a description of the unit performance task, which called on students to write an editorial, the agenda, measures of student learning, student group information, necessary scaffolding, and student practices and actions. In addition, I received a copy of the sample editorial and questions, the questions for the "Editorial Scavenger Hunt", the student handout for beginning the personal editorial, and a *Step up to Writing* booklet detailing Ms. Young's approach to teaching writing called *Handy Pages*. These contributions bolstered the collection of artifacts amassed from ENCMS as part of the study.

Ms. Smith

Ms. Smith was the first of the three teachers that I met during my visit. She called herself a "late-bloomer," having entered teaching in her 40's. She was abundantly patient, laid back even, and clearly seemed to enjoy spending time with students. The twenty-five children I observed in one of her classes were among the lowest-performing that I observed during my visit; they had an inclusion teacher assistant who provided academic and behavioral support due to the high percentage of special needs students assigned to at least

one section of the team. Ms. Smith shared her enthusiasm about starting to work toward her master's degree in education in the coming months.

Observation

Though the three teachers plan together to craft a unified lesson plan, this week they did not move at the same rate or complete identical activities. At the beginning of each class, Ms. Smith's 25 predominantly-minority students responded in bound notebooks to journal prompts posted on the whiteboard on a variety of topics including what they would rather be doing than be at school or why they think an entertainer chose to change his name. The students, seated in collaborative groupings, then spent 20-30 minutes of class time listening to a taped reading of *Roll of Thunder, Hear My Cry* before using their laptops to access a site called Edmodo that enabled them to answer questions about the novel and respond to each other's comments in a format somewhat akin to that of Facebook. The majority of the students engaged in the activity, though there were three students who did not complete the assignment. Two of the students merely read and laughed at the comments of their classmates rather than responding. A third student used the allotted time to surf the Internet.

On the second day of my visit, Ms. Smith's students began with a written journal assignment about the 1950's singing sensation Chubby Checker whose birthday was that day. Ms. Smith asked the students to consider why he might have changed his name before becoming a celebrity. After seven minutes of writing, the students then listened to a taped recording of *Roll of Thunder, Hear my Cry* for 20 minutes. The students spent the last 15-20 minutes of class writing about family traditions they observe. Most students were able to respond with about half a page of text, while study participant Derek wrote just over a page;

a few others struggled to write more than a line or two. One student in particular was never able to write beyond the one sentence that the EC inclusion assistant told him to write verbatim. The difficulty some students experienced lends some credibility to Ms. Smith's side comment to me earlier during class that, "they (the students) hate writing." Other than the posted student learning outcome at the corner of the whiteboard – *use editorial examples to identify the infringement upon rights and human freedom* – there was no immediate evidence during the observations that the students would read or write an editorial as was stated in the team lesson plan for the week.

Interview

Ms. Smith asserted that 1:1 access, particularly in combination with the newly-adopted Common Core Curriculum, has increased the expectation for the amount of writing taking place in her classroom. She explained, "We're expected with the Common Core to dig deeper, and that helps because the students that want to be on the computer are able to express themselves more." She appreciated that 1:1 laptop access permitted research of different topics, choices for students, and convenient tools for research. Over the years, she has witnessed the students' excitement about using the laptops and determined that access generally had a positive impact on learning. "When you see the excitement they have when they are able to use the computers, they seem to do better work and want to put more into it because they're proud of what they're doing." She felt that she could better meet each of her students' needs with the laptops, saying, "…it (1:1 access) helps with diversity (in creating assignments)." During my observation, Ms. Smith directed the class to a site similar in nature to Facebook called Edmodo that students utilized to respond in a couple of sentences

to questions about their *Roll of Thunder, Hear My Cry* reading and then respond to their peers' comments. The majority of the students worked steadily and enthusiastically to complete the assignment; they seemed to embrace this format for literature response.

Despite the enthusiasm of her students for online writing activities, Ms. Smith continued to use traditional journal notebooks in her classroom. According to her, these notebooks were intended primarily for the students to scribe their responses to a daily question often related to entertainment or matters of personal interest to the students such as, "What would you rather be doing today than be here at school?" Ms. Smith indicated that she enjoyed responding in writing to her students' journal entries every weekend as she believed it helped to build rapport with them. Clearly, Ms. Smith acknowledged the value in 1:1 access, though she also relished more traditional writing instructional practices as well. She explained, "I feel that they need more writing… I just like the fact that they write. They seem to share better when they physically write something – they'll share more personal things in a journal than they will on a computer when they know – 'she may print this.' But they know… I'm only going to read the journal. So, I feel like it's a personal thing." Matters of content and curriculum were important to her, yet she incorporated laptop technology based perhaps more so on her children's excitement, interest, and pride in their work, emphasizing a pedagogical focus.

Ms. Smith further explained that laptops were a great tool, but that they should not be used "all the time." She believed that students "need some basics that they do not get on the computer. They need instruction on how to write in order to be able to write effectively." Concerning the content and quantity of student writing, she noted that students seemed to

"share better" when they physically write something. Ms. Smith liked to take her students' journals home on the weekend and "write back" to them. In her estimation, there was great value for students in having an "audience of one" and personal handwritten feedback from the teacher as facilitated by handwritten journaling.

Concerning challenges with 1:1 laptop access in the classroom, Ms. Smith, a self-described "late bloomer" to teaching, was apprehensive that her students had more technical knowledge than she did. She quipped, "They teach ME things about the computer!" When she first came to the 1:1 setting just over seven years ago, she had to learn everything quickly, as her students seemed "lost" without frequent access to their laptops. She explained, "They really enjoy the technology. They're proud of their laptops. To many of them, that's their laptop. That's how they feel." With time and experience, she was better able to navigate the technology to provide meaningful writing activities for her students. Despite seven years of teaching language arts with 1:1 access, she continued to feel challenged by an inability to monitor all the children at once as they work. "Children tend to wander," she noted, and she asserted that having more adults in the classroom would help to alleviate off-task activity.

Ms. Smith reiterated that even with the advantage of having laptops, some of her students still did not know how to write. She declared, "They need to be instructed specifically on how to write." Nonetheless, she acknowledged that the students do enjoy using the computer and put more work into their writing as a result. Though they are more motivated and engaged in their work, she was of the mind that their engagement and willingness to work more on the computers was not enough. She admonished, "They need

basics that they don't get on the computer." Her comments reflected an emphasis on pedagogy to meet content requirements.

Ms. Baker

The second teacher assisting with my study at this school was away on the first day of my visit, so I met Ms. Baker the following day. She was pleasant, well-mannered, highly articulate, and her demeanor belied her military background. With a booming voice that brought her classroom to life, Ms. Baker's students clearly respected her and strove to meet her expectations. For personal and professional development, she indicated that she was working on a masters' degree in administration.

Observation

According to the ELA team's lesson plans, the writing focus for the week I observed was to create an argumentative editorial that would appear in the local paper. In Ms. Baker's class, I observed the 15 students, divided almost equally among African-American, Caucasian, and Hispanic descent, seated in collaborative groupings akin to Ms. Smith's room reading a sample editorial and having their teacher discuss it with them at length. After the reading, the students answered multiple choice questions related to the content. Once the students completed the worksheet, Ms. Baker announced, "Starting tomorrow, you will be writing an opinion editorial about human rights."

When I returned the next day, however, there was no mention of the editorial as students were directed instead to answer questions online about their reading of *Roll of Thunder, Hear My Cry* using *Edmodo* in a manner similar to Ms. Smith's class. After the students diligently completed responses to the questions online, they used their wire-bound

journals to record notes from the whiteboard on types of analogy relationships that Ms. Baker briefly reviewed during whole-group discussion; this was listed as an objective on the ELA team's lesson plan, though it did not appear to have a direct connection to the *Roll of Thunder* reading or the editorial reading activity from the previous day. There were no journals or free writing activities akin to those taking place in other classrooms observed during my two days of visits.

Interview

Conversation with Ms. Baker focused closely on her content and technological concerns. She explained a specific goal concerning her writing instruction: helping students understand the difference between formal and informal language. She liked many features of the laptops for teaching writing: the read-aloud option, proofreading and editing software, research capabilities, increased opportunities for visuals, and wikis to enhance student opportunities for metacognition. She was adamant that "students are engaged when the lesson is meaningful. The laptop is not a babysitter – it is strictly for instruction and a resource tool to help you facilitate the best learning environment possible." Though she asserted a belief that using computers was second nature to her students, she acknowledged that it was important for students to be taught how to read and write collaboratively in a technology age.

According to Ms. Baker, part of accomplishing the task of reading and writing in a digital era involved taking time to teach the process. She viewed "less is more" in terms of writing assignments to be completed and relished the value of scaffolding lessons that focus on specific traits of writing, beginning with organization. She also expressed value in having

the students begin with a baseline for their writing ability so as to be able to chart their progress. For her, laptops have proven useful in "carrying out the mandates of the curriculum, encouraging students to improve the quality of their writing, and grading student writing" with the use of online programs such as *My Access*. She asserted that *Pages* enabled her students to focus on the impact of their word choice in writing as opposed to the mechanics of the process. Like her teammates, she embraced many of the possibilities that 1:1 access affords students and teachers in the middle grades English language arts setting.

Concerning challenges teaching in the 1:1 laptop setting, Ms. Baker expressed concern about being able to monitor her students' work on their laptops. She elaborated, specifically citing as her challenges, "classroom management of the computers and then implementing them so that they are most effective… that they (the students) glean something from them rather than just use them." She indicated that management of time on task was an ever-present challenge and that it was sometimes difficult to make the students' work time most effective when using their laptops. Accessing student writing to provide appropriate feedback online was an additional difficulty that Ms. Baker experienced. She indicated that students were able to use the software to provide peer feedback, but that the program was set up in such a way that teacher edits and comments to student work could not be saved. To meet this difficulty, she indicated that she now manually records her feedback on a form that the students match to their writing to make necessary corrections.

In looking at changes in the types of writing activities and the time allotted for writing process, Ms. Baker now reserves handwritten writing activities for note-taking. She asserted that one of the benefits to 1:1 access for writing was the heightened awareness

students had concerning matters of style. Because they were no longer so caught up in the "laborious act of having to script," students' ideas flowed better, and there was no longer the hindrance of having to worry about how to spell a word. She noted, "…They (the students) are more aware of the content… the organizational structure of it. Their style seems to improve." Students writing in 1:1 settings thus have a greater opportunity to focus on the word and its impact on the text rather than on spelling and usage.

She further asserted that having laptops "levels the playing field because all children – regardless of what background (they) come from – have access to that knowledge. If (they) don't come with the prior knowledge, (they) have the ability to gain that." While she acknowledged that parents in her community did not know much about the minute details of the curriculum, she explained that they did have expectations concerning writing in the 1:1 setting. She noted, "They want to know that their child is being prepared with 21st century skills, that their child can write a resume in the computer skills class, that they can write a letter to someone and that they understand the purpose and function of writing and different types of writing." Ms. Baker asserted that she and her team were meeting parent expectations.

Ms. Young

The third teacher at ENCMS, Ms. Young, was a 17-year veteran to the ELA classroom, and she was effusive in her love of writing. As a National Writing Project graduate, Ms. Young's room clearly reflected her passion for writing as it was decorated with posters throughout the room that featured steps for writing, inspiring quotations, and reminders for quality writing. She said she would teach writing all day and leave the "other

stuff" to someone else if she could. Her enthusiasm and enjoyment of teaching were infectious, so it came as no surprise that she has considered instructing future teachers at the college level someday. Her responsibilities at the time of this study included providing instruction for AIG-identified students as well as teaching one section of sixth grade ELA.

Ms. Young shared a copy of the lesson plans that had been developed for the week of my visit. This document included a description of the unit performance task, the agenda, measures of student learning, student group information, necessary scaffolding, and student practices and actions. In addition, I received a copy of the sample editorial and questions, the questions for the "Editorial Scavenger Hunt," the student handout for beginning the personal editorial, and a *Step Up to Writing* booklet detailing Ms. Young's approach to teaching writing called *Handy Pages*.

Observation

During my visit, Ms. Young's class adhered closely to the ELA team's anticipated lesson plan. Based on the previous day's introduction to editorials, the 32 enrolled students, seated in collaborative groupings as members of an AIG-inclusion class, brought in their own examples of editorials. Amid a buzz of activity, the students, nearly ¾ of whom were Caucasian, used their editorials to answer a series of five short-response questions in an "Editorial Scavenger Hunt" that required them to consider the issue addressed, the author's position, the presence or absence of a counterargument, and their own personal opinion concerning the editorial topic. The objective posted on the board was easily accessible for students and guests alike – *Identify parts of an editorial*. The Essential Questions read: *Why do people stereotype others? How do we protect our rights?*

The students then used their laptops to research topics of personal interest so as to develop their own editorials. Some students wanted to learn more about steroid abuse or the treatment of animals in zoos, while others explored the Casey Anthony case. Once the students had a topic in mind, they brainstormed reasons that supported their position and recorded them on notebook paper. Next, they used 6X8-inch note cards provided by Ms. Young to record their position and to list the reasons they had generated to validate their claim. Ms. Young called the students to her table individually or in pairs to review their work while the other students researched, drafted, or worked on their *Roll of Thunder, Hear My Cry* web quest using their laptops. For homework, the students were to complete a handwritten draft of their ideas for the editorial.

Students reported to class the next day with a handwritten draft that fleshed out their arguments. After a brief class meeting, Ms. Young used a document camera to project a sample notecard for the students to see the components of an editorial. Students were then instructed to continue writing. Ms. Young circulated among the students to preview their drafts individually or in small groups. With her approval, students then began to flesh out their editorials on their computer. As students completed their draft, some worked together using the laptops at their desks, while others moved to the floor to spread out and script in their notebooks or to continue using their notecards. The atmosphere was relaxed, and Ms. Young made the occasional humorous remark to keep the environment positive as students worked. At one point as students were writing, there was brief bantering about what a cassette player was as the students had no idea.

As the session wound down, the students were told that upon completion of their typed draft that they were to use an online program, *My Access*, to upload their writing. The software then graded the students on their organization and reported the number of grammatical errors present in their writing. Students were subsequently expected to make the required edits and submit their final editorial copy to Ms. Young the next day.

Interview

With 17 years in the middle grades English Language Arts classroom, Ms. Young has a commendable depth of experience from which to pull. She struggled to read and write as a young girl and was subsequently motivated to teach children better than the way she was taught. She credited several years of teaching writing as a tested area for her love of the subject, yet her recent experience of taking part in regional National Writing Project training also had some bearing on her passion. In our time together, she spoke a great deal about what she believed students needed. "They (the students) need to learn how to get their process down there, they need to learn different ways to plan, they need to get their feelings out or whatever, and that's why I love free writing." She pulled from a variety of resources to inspire her students' writing – literature, quotations, pictures, newspaper, and other writing as well. In her estimation, having laptops "has helped with their (the students') organization… the use of certain programs has helped with building their word choice and having that access to go and find different ways to write, just the ideas and being able to find that quote or that statistic has really helped."

She also appreciated the instant access to finding different ways to write things, ideas for writing, and quotations or statistics to enhance their message. She called herself "old

school" for her approach to teaching writing by having the students use note cards to organize and then write out their ideas by hand into a rough draft before beginning to write on their laptops. Despite having to spend "awhile" finding her way to what she believed worked best for students and the use of traditional classroom journals for note taking and writing autobiographical-style accounts, Ms. Young acknowledged, " I don't think I'd teach without it (1:1 access) – it would be very difficult for me to teach where I couldn't get them (the students) on a computer daily". With an undeniable passion for teaching writing, she demonstrated that her students' needs take priority over the demands of the curriculum or the potential "bells and whistles" of technology applications that do not directly aid the students in their efforts to be effective writers.

Ms. Young described her greatest initial challenge instructing writing in the 1:1 setting as having to "fumble around" with the more traditional idea of crafting text by hand before typing it rather than just jumping on a laptop and pounding away at the keys. She preferred to see her students organize their thoughts and handwrite a rough draft using paper and pencil before engaging in word processing. "I'm just one of those old-school 'you've got to write it before you type it' teachers. Handwriting (their draft) deters them (from plagiarizing). I tell them, 'I look at your handwriting versus your paper, and if your typed version is very different from the handwritten copy, you've made it into somebody else's piece, not yours.' They're smarter than you think."

A second challenge Ms. Young reported involved a focus on making certain students were on task during online time. In her experience, the boys were more likely to be risk takers and often tried to go to games and other sites they should not use; many of the students

"know how to trick you and try to hide it from you." She indicated that plagiarism has also been a recurring problem – the kids "know it's not right, but it's so easy to copy and paste and not use your own words".

On a positive note, Ms. Young observed several meaningful impacts of 1:1 access on student writing process. Primarily, she was grateful for the ease with which her students could revise. She shared, "If I tell the boys they can type it out, they're right on it. I've got some who say, 'Why do we have to write this first?' I tell them they have to organize it (their information) first, then they can write about it. Once they can type it, you see more interest and willingness to change it, edit it, etc. It's not like they have to rewrite it again; it's a little easier." She did note, however, that the students still needed to practice handwriting, as it was "horrible" in most cases. She explained that the students would like to learn cursive, but there was simply no time to do it during the school day.

Concerning other changes in the types of writing activities and the use of time for writing process in the 1:1 setting, Ms. Young felt that there was a "big push to have everything digital." In her county, quarterly performance events such as the editorial project being completed during my visit must have a laptop in order to be completed. Especially concerning issues of research, ubiquitous laptop access was crucial for student success. For students with special needs, she acknowledged, "Just because they cannot physically write does not mean they will be able to type. You have to make sure you give students with learning needs extra time and make modifications." To help struggling writers, Ms. Young trained some of her stronger writers to serve as writing buddies. She and an exceptional children's teaching colleague agreed that this process worked very well because "if a kid is

(identified for special needs as requiring the process or service of) dictate to scribe and can't get his thought process down, he's more willing to talk to a friend – we try to match them (the helper and the special needs student) based on personality, and they can get the writing done." This practice helped the process move along, as did having laptop access for getting the draft typed out neatly.

A final change inherent to1:1 access related to the use of traditional journals. Ms. Young's classroom notebooks function as a place for students to take notes for learning, and secondly, as an interactive scrapbook to store personal items such as movie stubs or event programs and to record free writing responses. Though the students could also include drawings as part of their written entries, Ms. Young required the students to explain "why they drew that particular picture – what about that drawing is important? And that's hard to do with a laptop." Combined with her passion for writing, Ms. Young's consistent care for her students and application of appropriate pedagogical strategies provided a foundation to which she added meaningful technological tools and activities to enhance her students' learning.

ENCMS Students: Individual Interviews and Focus Group Participants

Six students participated in the study at ENCMS. Three of them – Derek, Kierra, and Bryan – were in two sections of Ms. Smith's four ELA classes, and they were selected by Ms. Smith as students she felt would be comfortable sharing their thoughts concerning writing in a one-to-one interview setting. She also indicated that they would likely benefit from a boost in self-confidence by being chosen from among their peers for the opportunity to share their expertise and that they were responsible enough to return the requisite consent

form. The three remaining students in the study – Mike, Sarah, and Owen – were enrolled with Ms. Young, who selected them to participate in the study because they were confident writers, conscientious students, and comfortable interviewing in a focus group arrangement. Due to Ms. Baker's absence on the first day of my visit, no students were selected from her team to be interviewed as part of the study.

Derek was an energetic young man with a genuine enthusiasm for learning and a strong desire to do well in school. He was a laptop day-user, meaning that he had access to his laptop only during the school day. He was confident in himself, noting, "Since kindergarten, I have done well. I'm going to make good grades regardless (of not having 24/7 access)." He explained during his one-on-one interview that he doesn't have 24/7 laptop privileges because his family has a computer at home, and quite honestly, he's not a great fan of laptops for enhancing learning. He said, "I'm not a computer fanatic… I prefer pencil and paper because I can get done faster."

In class during my second day of observing, Derek dashed off a full page of writing about his family's traditions while the majority of his classmates plodded along more slowly, composing no more on average than a half page. When I interviewed him about writing, he explained, "I've always been a good writer. Most boys can't write as well as I can… they're sloppy. I love to write… about funny stuff, the NBA. I also like to read."

Kierra, the second student I interviewed individually from Ms. Smith's team, was polite, but quiet, and it was initially challenging to engage her in conversation. She indicated that she liked using her laptop because it made school work easier. She explained, "Things are easier with a laptop. You can find information, typing is easier… I can go more in-depth,

and it is easier to fix mistakes." When discussing her writing interests and preferences, she was hesitant, apparently lacking confidence. She noted, "I sometimes like to write. I always capitalize the first word of every sentence." When prodded, she elaborated, "I like to write about my future. Sometimes when I'm bored, I'll write stories." Despite some reluctance to talk during her interview, Kierra appeared to be well-liked among her peers, engaging easily in conversation during observations of her in class with peers and on the way to lunch.

Ms. Smith's third student participant was Bryan, and his gentle demeanor and kindness almost immediately set him apart from several of his classmates; he was polite, enthusiastic about participating in the study, and at ease talking with his teacher during class change and the interview. Eager to have the opportunity to talk about what laptop access meant to him, Bryan took pride in being among the few students on his team to be able to take his laptop home each night. He shared, "Most people are day users – I'm a 24/7. It's better for everybody – better to have it 24/7. It makes me want to go to school more. I've been sick in the past, but now I try to come to school more. I feel like my grades are better." He did admit some challenges with laptop access. He confessed, "It's still a little difficult – I try to figure out what I did wrong –what keys did I press? With the computers, I sometimes feel like I'm being watched. I will write in my notebook for privacy."

Focus Group Participants

Three additional students were interviewed at ENCMS. Mike, Owen, and Sarah were members of Ms. Young's AIG-inclusion team. They participated in a focus group interview to share their thoughts about writing instruction in the 1:1 laptop setting. Mike was a pleasant young man whose father was a school principal in a neighboring school system. He

worked diligently in class, taking occasional opportunities to trade comments with a neighbor or to ask a question of someone close by. Polite, down-to-earth, and enthusiastic about writing and the 1:1 program in our time together, Mike noted of laptop access, "It's good because you don't have to worry about your handwriting. You don't have to go to the library every time you need to research – you can just type in a few key words and get information that you need to do your work."

Owen, the second of Ms. Young's students, was also the son of a local school administrator, and he, too, was polite, yet he carried himself with subtle confidence. Though not boisterous or domineering, he was a leader among his peers in that students approached him for help during their writing workshop time, and he was often the first to answer questions during our focus group interview. He was knowledgeable and conscientious concerning his school work. During class, he stayed busy with his research and writing activities, stopping only when a neighbor asked him a question or when he was approached by another classmate with a comment or question. Of writing, he shared, "We do a lot of writing in language arts and our other classes. We also get to free write sometimes… I like to write suspense stories."

Sarah, the third student in the focus group, was friendly, energetic, and sincere. She, too, had a parent in the education field, and though she forgot her permission slip for our interview, Ms. Young was quickly able to reach her mother by telephone to secure permission for her to be included in the study. Sarah put considerable thought into her interview responses, often waiting to answer after her group mates had shared. She was enthusiastic about laptop learning and writing, gushing at one point: "I like to write about

everything. It helps with learning things." In class, Sarah worked diligently while also taking ample opportunity in Ms. Young's bustling classroom to reach out to friends and neighbors to comment on her research activities.

Student Interviews and Focus Group Discussion

In describing the challenges faced when writing in the 1:1 setting, the students often corroborated their teachers' assertions. Derek, Ms. Smith's student, indicated that it was hard for him to pay attention at times, though he stated he was not a "computer fanatic." He explained that he did not know everything about computers, but that there were always students around who knew the answers, and he knew he could ask them for help when he needed it. He expressed frustration that the teachers did not "crack down" on the 50% or so of students (his estimate) that were off-task during instructional time. This behavior led to some distractions for him.

Kierra, also in one of Ms. Smith's classes, mentioned having trouble staying focused at times as well. She said that some students in her class struggled to follow directions or to find the right websites for assignments and that they did not always pay attention. In addition to these concerns at school, Kierra worried that her younger brother at home might "mess up" her laptop or that it would somehow get broken.

Bryan, the third student individually interviewed from Ms. Smith's class, chimed in with his peers Derek and Kierra concerning distractions in the language arts setting. He indicated that since most of his classmates do not have 24/7 access to their laptops, they are often off-task during class. He estimated that at any given time when class was in session, about 70% of the boys were online visiting websites or using applications that were unrelated

to the given assignment. Personally, his greatest challenge involved some confusion at first as to how to use the computer. He explained that he sometimes had difficulty knowing which key he pressed to end up in unfamiliar applications or settings. In addition, he sometimes had trouble knowing how to navigate among the various applications he was responsible for using to complete his class assignments.

When asked about the challenges of writing in a 1:1 environment, student focus group participants Owen, Mike, and Sarah in Ms. Young's class reiterated the points concerning distractions and off-task behavior during instructional time, saying that it was frustrating to have classmates "messing around" with the laptops during school hours causing all of the students to lose their privileges and rendering them unable to complete their assignments online. The students chimed in that there were "lots of" regulations to follow and agreement contracts to consent to without fully understanding the wording of the contracts. Owen observed, "It's hard because you don't know if something you're doing is part of the agreement, and you don't know if what you're doing could get you in trouble. You don't know if you should hit agree or not." The students also struggled with using unfamiliar applications, while conversely being frustrated that there were some applications and websites that would be helpful in their work and research that were blocked or inaccessible at school. Sarah lamented, "We have a bunch of new applications that we can't use or we don't know how to use. When we try to use them, our teachers tell us not to." Mike agreed with Sarah, noting, "There are some sites that would be really helpful, but they're blocked."

When discussing other challenges concerning writing in the 1:1 setting, Sarah mentioned the frustration of using search engines and not being able to find the information

that was needed for the assignment. Mike chimed in saying, "When we're finding information for our writing, it's really hard not to plagiarize and to find information that you know is true and not like something somebody just threw up there." Finally, the students mentioned that, because they had a new science teacher this year on their team, they did not use their laptops as much – "she makes us write and use paper a lot more than we did last year." This situation was clearly disappointing to the students.

From Ms. Smith's team, Derek initially responded that there were no changes in the way that he wrote now that he has 1:1 access. When questioned further about what he liked about his laptop, he eventually conceded that he appreciated having instant access to information. He added, "We don't do much writing – just a few lines every day in our journals." Derek instead enjoyed writing independently using paper and pencil – "funny stuff" and the NBA were among his favorite topics of exploration.

Kierra also mentioned an affinity for finding information quickly on the laptop. She explained that she liked having 1:1 access because "typing is easier (than writing)." She liked using *Pages* (equivalent to *Microsoft Word* for Macs), though she was careful to assert, "I always capitalize the first word of every sentence." She said that her class writes about family and the things they do at home or for the holidays. This description matched the writing activity observed during my visit.

When asked about how having laptop access had impacted his writing, Bryan agreed with Kierra that having a laptop helped him to be a better writer, further adding that it also aided in his ability to make better grades. He cited a preference for using his computer rather than write out his work. He went on to say that the computer "spoils kids – makes me want

to go to school more". He cited being comfortable using *My Access* because he had used it since fourth grade. It was helpful to him because, after he writes in *Pages*, he can copy his work and then paste it into *My Access* so that "it checks your grammar and spelling, and makes it better." He shared that he liked to write about things with which he was familiar, including his family.

When asked about how laptop access had impacted the way they approach a writing assignment, student focus group participants Mike, Owen, and Sarah explained their writing process in greater detail. Like their schoolmates in Ms. Smith's classes, they appreciated the ready access to research tools and discussed using *Pages*, a program they liked because it freed them from having to worry about spelling, the neatness of their handwriting, and finding the right word for their writing assignments. Mike observed, "I'm not really good with paper. I don't really spell as well, and *Pages* helps me with that." After completing a document in *Pages*, the students then copy and paste their work into an online subscription service called *My Access*. The "My Editor" feature of *My Access* helps students edit their work, grading it based on organization and grammatical soundness. The students liked this feature because they were not confident about their spelling and handwriting. Owen indicated that he did not "have the best handwriting in the world," and Sarah explained her preference for writing online, noting, "I write really fast, and sometimes I can't read what I've written. All of the words are bunched together." The students also reported that they liked having immediate access to a dictionary.

Discussing the changes in writing activities with 1:1 access, Mike, Owen, and Sarah agreed that they do a lot of writing in Ms. Young's class. They liked that they were able to

free write "sometimes" and asserted that choosing their own topics made the writing "more interesting." Left to their own devices, they liked to create their own stories – adventure, suspense, action – in particular. Sarah expressed that she liked to write about "everything" because it helped her with learning. In addition, she liked being able to type her work on the laptop because she described herself as a fast writer who could not always read what she had written with all the words "bunched together." She said that some of her friends liked *Pages* because they could use different colors and fonts for their writing – it helped them to be more creative and express themselves more easily.

The students, when asked about how they use computers for writing, reported that they liked the convenience of using their laptops for research. They discussed using an application called *NetTracker* because it provided different tools for searching and then led them to numerous reliable resources for their assignments and projects. They have discovered that, because of the new emphasis on the Common Core curriculum, they have to explain their answers more often and with increasing depth; having the laptop puts the information at their fingertips. Owen and Sarah agreed with Mike that it was helpful to be able to "type in just a few key words and get the information that you need to do your work."

Interestingly, the students acknowledged a need for traditional pencil and paper activities at times. They specifically valued taking notes by hand because of the variety of symbols and the use of arrows or circling of specific ideas or points that a pen and paper facilitated. Several of the students also found it easier to organize their thoughts on paper for writing assignments. They appreciated having a written rough draft that they worked from to

craft a second draft into *Pages*. This additional step helped them to identify their grammatical errors quickly and then easily fix them.

Site Two: Southwestern North Carolina Middle School

Background

The Southwestern North Carolina middle school (SWNCMS) enrolls just over 900 students in grades 7 and 8. Nearly 75% of the students are Caucasian, with the remaining population made up of 15% African American, 7% Hispanic, and 4% multi-racial or of Asian descent. Close to 40% of the students now qualify for free or reduced lunch. Tested subjects have consistently risen in percentage of students' passing state assessments in reading and math since laptops were introduced to all students in grades 4-12 for 24/7 use in the fall of 2009. In fact, the school system, comprised of eight schools, is among the top performers in the entire state. Two years ago, the district began hosting a summer institute for 1:1 learning for its faculty which also included over 250 participants from 12 states and 36 school systems. The more recent 2012 "Summer Connection" event boasted 400 participants from all over the United States, clearly positioning this district as a leader in 1:1 learning initiatives.

The district's sole middle school proudly asserts its goal to put kids first by providing a 21st century environment each day. Each day begins with the principal's cheerful announcements, and various student groups can often be found helping with special news. During class change, the halls bustle with upbeat students. They smile, moving purposefully through the halls to their destination. Teachers are in the hallways by their doors greeting students with enthusiastic smiles and handshakes. The school is clean, bright, and inviting.

SWNCMS's day is divided into a brief homeroom period followed by four 67-minute core classes, two 44-minute electives, and a 25-minute lunch. Three of the four eighth grade teams have common planning time, and the fourth team is provided coverage to permit one weekly team meeting. Subject-area departments also meet regularly to plan instruction for all students on the grade level.

Teacher Participants

This school serves seventh and eighth grade students in one of eight four-person teams, each named for a North Carolina college or university. Numerous electives staff members and exceptional children's inclusion support personnel contribute to a staff of approximately 52 teachers. There are four English language arts teachers per grade level, and they meet weekly to plan together. Teamwork and collaboration are clearly at play, and the guiding philosophy reflects that teachers here *work smarter, not harder*. At any given time, what is taking place in one language arts classroom at this school should be much akin to the activities taking place in a language arts class of the same grade level down the hall, as was the case in the two English language arts classrooms that I visited.

Ms. Thomas

Ms. Thomas was the eighth grade language arts department chair and the first teacher to whom I was introduced the first morning of my visit. At the time of the study, she had taught for eleven years, and I was immediately impressed by the rapport she had established with her students. As they entered for language arts, she greeted each one cheerfully with an energetic handshake at the door and immediately engaged the class in a brief sharing time when students announced good news or "vented" their frustration concerning something in

their lives. Throughout class, the pace was brisk, but purposeful. Ms. Thomas moved from group to group around the room, providing instructions, updates, and encouragement. Among her demonstrated strengths was an ability to use humor to maintain an inviting atmosphere, engage students, keep them on task. It was evident that Ms. Thomas enjoyed teaching; interestingly, she has given some thought to becoming a school administrator when her children are older. During our interview, she provided me with a link to print a copy of the team's weekly lesson plans, which also included an anticipation guide, student survey results, vocabulary words and quiz, discussion forum information, vocabulary homework directions, student rotation activity directions, elements of literature bingo materials, and reading log blog information.

Observations

After the morning announcements, my first day began in Ms. Thomas' room. She was teaching an exceptional children's inclusion class, with the EC teacher monitoring students and providing moderate instructional support. After allowing for the sharing of good news or venting of minor frustrations, Ms. Thomas introduced the 21 students, divided nearly equally among African-American, Caucasian, and Hispanic descent, to the day's agenda, which involved rotations among three stations of online activities that would be approximately 20 minutes each in duration. Below the agenda, announcements were posted on the board as well as the learning objectives: *5.02 – I will evaluate the impact of literary elements in what I read or hear; 5.01 – I will respond critically to what I have read, heard, or viewed; 2.01 – I will analyze and evaluate informational materials; and 1.03 – I will interact in my group in a respectful manner.* The verbs were highlighted for emphasis. On a

side wall adjacent to “Writing for Success” posters were growth and percentage charts for each quarter with data from pre-assessment, mid-terms, and quarterly assessments in Ms. Thomas’ language arts classes.

During the observation, the first group of students closest to the door completed point of view questions based on their reading of the young-adult novel *Tears of a Tiger*. The second group near the whiteboard read a short news article similar in content to the novel and then responded to a series of short answer questions about the reading. The third group by the window collaborated to complete double-entry journals based on the characters and phrases that described them found in the text. Ms. Thomas explained she would work primarily with the double-entry journal group, and the EC-inclusion teacher floated between the other two groups to monitor behavior and encourage active participation.

Each group was assigned team roles including facilitator, task manager, time keeper, and reporter. These role titles were displayed prominently on double-sided tags placed atop each student’s laptop. After a few minutes during which the double-entry journal team’s facilitator took on increasing responsibility for the group’s discussion, Ms. Thomas moved to the point-of-view activity group to provide additional clarification and support to the group. Most of the students were on task with a couple of non-disruptive exceptions, and the noise level was reasonable, if a little quieter than expected for middle school-age discussion activities. The students that I observed during second core repeated the activity, though they were a bit rambunctious and required more consistent teacher monitoring to remain on task. At one point, Ms. Thomas pulled up a chair to work with a group in the middle of the room that seemed to be the least capable of staying focused on their task of reading a newspaper

article about a drunk driving tragedy and responding to follow-up questions online. In her presence, the students entered into an animated discussion about what constituted an inference. Throughout my observation time, Ms. Thomas demonstrated attributes of an organized and accomplished teacher for whom classroom management challenges were rare. Her directives were succinct: *There should not be any silence; Discussion is more important than you typing your own thoughts; Don't get ahead – you have to stay together.*

On the second day of the visit, I repeated my schedule beginning with Ms. Thomas for two sessions and then seeing Ms. Nelson for the final two core classes. The students in each of the teachers' two classes completed short tasks including a survey about reading and nomination forms for teaching excellence using the school's online learning system known as *Angel*. They then played language arts bingo to review the literature terms that they had spent several weeks studying. As class wound down, the students were reminded that vocabulary homework would be due the following day and that reading logs and a vocabulary quiz would take place on Friday. There were no observable differences concerning student work or behavior among the four sections.

Interview

Ms. Thomas, an energetic teacher with just over a decade of experience in the classroom – over half of those years in the 1:1 setting – engaged her students in a classroom that ran smoothly, was procedure-oriented, and featured learning that, based on my observation, was both enjoyable for the students and purposeful. She demonstrated pedagogical expertise as the students engaged in practicing skills that were relevant to their understanding of the novel and to their success in reading and comprehending text. Ms.

Thomas chose to teach out of a desire to help students enjoy reading and writing more than she did as a student. She recalled, "I loved to read and write when I was little… I used to do poetry books and write creative stories. I saw that other students did not have that passion, and I didn't see the teachers giving them the inspiration to do that, so I just wanted to make a difference."

As department chair, she clearly took curriculum matters seriously, and the variety of activities the students completed during my visit demonstrated their experience and understanding of important concepts. This was evidenced by their ability to work well in groups and to complete the assigned tasks, including successfully participating in the literary terms bingo game. Ms. Thomas' interview responses emphasized considerable thought as to what was pedagogically best for students. For instance, she noted of writing assignments, "I think you need to expose students to everything – compare/contrast, expository, persuasive, etc.; the more they're exposed to, the more you're going to find something they are passionate about." She further explained that the laptops enabled her to assign projects in multiple ways that appeal to most every student. To illustrate, she discussed the value of making an I-movie in terms of the amount of writing involved as well as the reading comprehension that takes place as students must find images to bring to life their scripted ideas. She observed, "I've never had an assignment where I'm like, 'How can I fit the laptop in?' It's more like, 'How can the writing activity be enhanced by this awesome tool?'" For Ms. Thomas, the requirements of the curriculum and the needs of the students take precedence over the selection of available technology tools.

Further evidence of Ms. Thomas' priorities related to her enthusiasm concerning 1:1 access and differentiation. She appreciated being able to reach every child in her classroom. Ms. Thomas clearly believed teachers must be flexible and respond to each student's needs. She asserted, "If a student is struggling with the way I'm presenting a concept, the laptops make it possible to find another way. No longer is it 'you do it this way, my way, because that's how you have to do it'; that's when students shut down." Laptop access offered students a variety of tools to enhance the various aspects of the writing process. Recognizing the need for variety, she coached her students, "You do what's best to make you a better writer, a better thinker, a better creative designer if you will…" Flexibility, then, was critical for her in meeting various student needs using laptop applications as a conduit for helping each class master curriculum content.

The same flexibility explained Ms. Thomas's assertion that "some things still need to be done on paper with pencil." Her students, and all of the eighth grade students at this middle school, scribe their grammar notes in individual notebooks kept in the classroom. She asserted that students benefit from writing the information down and seeing it done correctly She explained, "… Some things still need to be done on paper with pencil. We do our grammar notes in notebooks because they need to write the information down… to see it done correctly, the old school way. We then apply it to our laptop activities. They need that balance with paper and pencil." The knowledge that students gain in writing notes and practicing on paper before reinforcing the concepts using their laptops creates, in her view, such a balance. Sharing an example, Ms. Thomas described a recent collaborative project in which the students researched a topic online, wrote summary information describing what

they had learned, and then completed a traditional poster board detailing their findings that they shared in a presentation with their classmates. Ms. Thomas explained that students "need to see that the laptop is a great tool in the classroom, but it doesn't have to have everything done on it."

In discussing challenges in the 1:1 setting, Ms. Thomas expressed few personal challenges with teaching writing in a laptop-enabled classroom. She recalled struggling as a new teacher to adapt to the technology initially, but she quickly caught on to the extent that during her second year of teaching in a new setting where she no longer had 1:1 access with her students, the experience felt for her "like taking a step back in time." To make for a smooth transition in the 1:1 setting, Ms. Thomas indicated that she "easily let go (of her fears of not knowing everything) with my students teaching me, and it was a good relationship." She acknowledged that the students get distracted "a little bit" with the boys being interested in online games and the girls in looking at pictures, but generally speaking from her perspective there were no significant issues concerning distractions in her 1:1 classroom.

Of greater importance for Ms. Thomas, however, was the necessity of being able to adapt and make changes in a 1:1 environment. Making grammatical corrections involved such an adaptation for her – instead of using the tradition symbols to physically mark papers in hand, she came to embrace computer-friendly tools and keystrokes (bold, highlighting, etc.) to address errors online. She observed, "When you think of the writing process, you think of 'read my paper, make editing marks (corrections) to the grammatical errors, give it back to me, let me fix those' and then your final draft was typed. Now your rough draft is

typed." She does use the comments function in *Pages* to help students with editing, but acknowledged that "it's not the same as circling, drawing errors, etc."

Nonetheless, Ms. Thomas suggested that students were able to move more quickly through their writing with laptop access. She noted, "They don't get bogged down as easily or frustrated as quickly because their rough draft is already typed, so it's a work in progress from the start." As a result, students were more apt to write, complete longer writing assignments, and perhaps most importantly, to write in increasing amounts. She explained, "You can get more out of them like even a journal, a freewrite at the beginning of class… They are going to write a lot more than if I had it on pen and paper." After all, Ms. Thomas observed, "this is their century – we are using their tools and allowing them to express themselves and learn from each other."

An added benefit of the 1:1 environment for Ms. Thomas related to the students' willingness to help one another. She observed that students have moved beyond clique-like middle school tendencies because "they are proud of the fact that they know something. When a student has a problem and raises their hand to ask 'who knows how to do this?', another student will say, 'I can help her'. They may be from two very different groups, but nobody judges them. It makes the classroom more professional."

Ms. Thomas further determined that her students benefit from the pride they have in being able to navigate successfully among the various applications and online resources available with their laptops. She noted that they are more inclined to help one another, which makes the writing classroom more professional. The students collaborate more easily and work together well, even transcending the traditional clique-like behaviors inherent to

adolescent learners. In addition, her students' parents "are impressed with how much students are willing to do now – just the student work output." Ms. Thomas found that students invest more effort when they have access to "their tools" to accomplish school assignments. Her understanding of pedagogy and the requirements of the curriculum content enabled her to maximize the use of technology to make learning enjoyable and purposeful for students.

Ms. Nelson

Ms. Nelson was the second eighth grade teacher selected by her principal to take part in the study. She was "awesome" as her principal declared, and it was immediately clear that, despite her relative newness to the classroom, she was a leader among her peers. Throughout the two days of my visits, at least four teaching colleagues came to her for curriculum suggestions, technical assistance, procedure clarification, and schedule questions. Though she was only at the start of her third year of teaching, she had already served on her school's improvement team and demonstrated considerable mastery of classroom management. According to her principal, Ms. Nelson was consistently innovative, reflective, and conscientious in her efforts to help students and her colleagues.

As soon as her principal approached her about taking part in this study, Ms. Nelson immediately contacted me with an offer to help in whatever way she could. She shared handouts of the online activities the students completed during their rotation activities, including a character log sheet, point of view short answer question activities, a newspaper article relating to the content of the novel the students were reading, and questions based on

the article. In addition, she offered to help me with any follow-up matters once my visit had concluded.

Observations

After a short lunch during my first day of observations at SWNCMS, I spent the afternoon and remaining two core classes with Ms. Nelson. After a "good news" sharing time akin to the demonstrated procedure in Ms. Thomas' class, the 26 students (19 of whom were Caucasian) completed identical rotation activities as seen earlier in the day with Ms. Thomas. One notable difference was that the EC inclusion teacher working with Ms. Nelson actively guided the point-of-view rotation groups while Ms. Nelson led the double-entry character journal activity. This arrangement enabled the students in her class to have the equivalent of small group instruction for two-thirds of the session.

It became clear from the first day's observations that both teachers closely followed the team-generated lesson plans; aside from personality quirks and perhaps some pacing matters among leveled classes, there appeared to be little difference between the two language arts classrooms. Interestingly, it also became apparent that Ms. Nelson's classroom was slightly more animated than Ms. Thomas'. There were two or three students in Ms. Nelson's EC inclusion class who clearly struggled to stay focused on the given assignments and their behavior, though not overtly disruptive throughout the class period, distracted some students around them; the quality of their work effort was likely impacted as a result.

One of Ms. Nelson's students in the first class observed spent the first 15 minutes of class out of the room; when he returned to his seat, he appeared to be web-surfing and distracting students around him for another 10 to 15 minutes until he attracted Ms. Nelson's

attention, and she gave him directions to begin working. Once she went back to work with another group, he renewed his off-task behaviors until she returned a second time, sat down with him and provided sustained attention. Working closely with her small group, Ms. Nelson did not observe some of the other students' off-task behaviors, including another young man who was showing Google images to his neighbor even as visitors were entering the classroom as part of a planned visitation event.

On the second day of my visit, Ms. Nelson again welcomed her students warmly and engaged them in a "good news and venting" time. She then instructed the students to complete the online survey about reading and the teaching excellence nomination forms using the school's online learning system, *Angel*. The students then played language arts bingo to review their literary terms. Though students were a bit louder, there were no differences in lesson content from what was observed with Ms. Thomas. Observation notes and researcher reflections point to one certainty: Collaborative planning is clearly a strength for this teaching team as class activities, behavior expectations, and management techniques are student-centered and as close to identical as could be expected in two distinct classroom settings.

Interview

Ms. Nelson, in her third year teaching eighth grade, expressed a love of teaching and the challenge and fun of being with middle school aged students. Leader of the creative writing club at SWNCMS, she guided her classroom in a manner that aptly served as a testament to her self-professed love of reading and writing. Of writing, she explained, "We try to do a lot of writing because it's so crucial to their (the students') development – we ask

them to craft their own questions to things to get to the higher order of Bloom's. We try to have them create their own writing as they go, and laptops are a great tool for that."

Though the students submitted most of their writing online in the form of blog responses, warm-ups usually a paragraph in length, or vocabulary stories, when the students completed a more long-term assignment, she required the students to turn in a paper copy. This traditional method of grading papers was important to her because it enabled her to write comments on each paper, to "add that personal touch" as she put it. Observations of Ms. Nelson's classroom supported the assumption that the 1:1 technology is utilized well, but for Ms. Nelson, meeting the students' needs and completing curriculum-related activities that help her students grow as learners clearly functioned as her greater priorities.

Concerning challenges, Ms. Nelson believed there were difficulties every day when functioning in a 1:1 setting. For instance, "Sometimes the technology doesn't work," as was the case for one of Ms. Nelson's colleagues who was hosting out-of-state visitors in his classroom at the time. She remarked, "You just have to go with it – the students understand that it happens, and they go with it as well". Flexibility, she explained, was a huge part of working successfully in a 1:1 environment.

When Ms. Nelson arrived at her school a little over two years ago, the laptop program had been in place for three years. She recalled asking her students and colleagues how to use certain applications and find necessary resources online. With no prior experience using Macs, the operating system present at the school, she had first to acclimate to that variable. Additional concerns for her related to making corrections to her students' papers and providing meaningful feedback. She found it difficult to add comments specifically to

different paragraphs online, which was possible using *Pages*, the system's equivalent of Microsoft Word, and she felt her response was not personal in that environment.

As an additional challenge, Ms. Nelson indicated that her students still experienced distractions in the 1:1 setting. Instead of doodling, she explained, "they (the students) are going to websites to play games, or engaging in social activities like Pinterest." According to her, "You really have to make sure they are focused all the time – that is why I am constantly moving around the room to keep my eye on them, to keep them on task."

While most members of her school community have been supportive of the 1:1 initiative, Ms. Nelson found that people not familiar with the computers are often against them. Of parents, she noted, "If their children are not succeeding at school, they are quick to blame the computers because it's an 'easy target'." One parent was so dissatisfied with her child's performance in the 1:1 setting that she returned her daughter's laptop to the school, and the student then had to receive paper copies of every assignment for the remainder of the school year. Still other students for financial reasons do not have a laptop for use at school or in their home, though there are "not many" according to Ms. Nelson. She lamented that situations like these put students at a disadvantage in the classroom when most activities were only accessible via the laptop.

In the English language arts setting, Ms. Nelson agreed that laptops were a great tool for writing – they increased engagement for her students because of the many activities available – research resources, tools for organizing information, applications to record notes, etc. She also appreciated the creativity that laptops enabled for students. A favorite resource that she utilized regularly with her classes was *SAS Curriculum Pathways*, a free online

application where students can upload or paste their writing. The program then reports on the number of run-ons, inappropriate verb uses, sentence fragments, and other grammatical maladies present in the writing. Though the program identifies the issues, it does not teach the students how to correct them. This responsibility, in Ms. Nelson's estimation, "belongs to the teacher."

In responding to the need for grammatical guidance per *SAS Curriculum Pathways* feedback and the newly-implemented Common Core curriculum, Ms. Nelson asserted, "There is definitely some benefit to having students write some things out. Grammar is a very complex topic, and students haven't had much formal teaching of it because it hasn't been covered on the EOG in recent years, and so it hasn't been taught." She and her teammate Ms. Nelson agreed there was a tremendous benefit to having the students take the time to scribe notes, write out sample sentences, and later practice and reinforce what they have learned using their laptops. The students have wire-bound notebooks set aside for this purpose in every eighth grade language arts classrooms.

Even with a prevalent need for handwritten activities in the English language arts setting, Ms. Nelson has found that 1:1 access made writing more fun for her students. With new applications and online tools, mundane assignments, she reported, such as book reports become more engaging as they evolve into film trailers using I-Movie or blog entries for online viewing. Though her students enjoy using their computer for all aspects of their writing, Ms. Nelson stipulated that they submit lengthier pieces to her on paper so that she can craft handwritten responses. This traditional approach to grading functioned as more

personal for her and provided a more meaningful way to share valuable feedback with her students.

Further concerning grading, Ms. Nelson found herself able to score shorter writing assignments online more efficiently. She found that she was more quickly able to "just read and see that they are understanding, they have got the point…" She recalled during her student teaching experience taking home stacks and stacks of paper. Online writing assignments made the potentially burdensome process of grading student writing more convenient and less overwhelming. Nonetheless, when students engage in a more in-depth writing assignment, she expressed a preference for her students to print their final copy so she can grade their effort by hand and provide written comments for a "personal touch." Appropriate pedagogical practices to meet content requirements functioned as priorities for Ms. Nelson above the utilization of the available technology tools and applications.

SWNCMS Students

Five students from Ms. Nelson's team were invited to participate in the study. Of those five, only two remembered to return their consent forms in time for the interviews. The first student, Noah, was polite, self-assured, and conscientious about his schoolwork; he was happy to participate in this study as he enjoyed writing and using his laptop, though he did express some concern about missing class time to take part in our focus group. As we entered the media center to begin our focus group interview, the librarian joked easily with Noah, indicating an easygoing rapport with the young man. Noah shared his plans to be a forensic investigator when he grows up, explaining that if his forensic investigation plans do not work out, he would consider being a writer.

Serena, the second student who dutifully returned the study consent form, was also part of Ms. Nelson's team. She was friendly with a sweet, infectious smile. Dressed in trendy clothes and accessories, being fashionable appeared to be a priority for her, though she also demonstrated sincerity and a desire to do well in school. Ms. Nelson indicated that Serena was popular and well-liked among her peers. Serena would like to be a fashion designer when she is older. Her favorite writing activity involved penning letters to her friends.

Focus Group Discussion

Noah and Serena expressed difficulties of their own as writers in a 1:1 setting when asked about the challenges they had experienced. Serena remembered being worried that it would be hard when she first received her laptop. She was not "really into computers" as a fifth grader, indicating she had just gotten a cell phone she did not even know how to use. Using the right-click function was difficult for her, and there were new commands that required some adjusting to use correctly. She observed that sometimes people in her classroom were distracting because they do not "follow what we're on" or play games online. At any given time, she estimated that close to 20% of her classmates might be off task. She explained, "If they don't understand what they're supposed to be doing, they'll play games, or if they're finished, they go on games, even though they're not supposed to." She surmised that the discipline problems involving laptops occurred more frequently with the kids who used the computers at school, but could not take them home. Matt concurred, noting, "They (the students breaking the rules) are getting more savvy."

Noah, conversely, recalled being excited when he received his laptop. He remembered initially having trouble with the touchpad since he was accustomed to having a mouse with his computer at home. Nowadays, he observed, "I have a hard time using a PC. The Mac is easier for me now." Though he had since adjusted, he explained that it was still challenging for him to type fast when he writes, to move from one application to another when doing research, and to deal with the distractions of his classmates and the subsequent ramifications of their savvy methods of trickery that end up penalizing all of the student laptop users.

Concerning the impact of laptop access on their writing habits, neither Noah or Serena articulated any particular changes in the types of writing they did or their use of time for writing in the 1:1 setting. They explained that most of their classes begin with warm-ups for which they are responsible for writing a 5-10 sentence paragraph answer to a subject-specific prompt. In addition, the students write stories in language arts using new vocabulary several times a quarter. At the end of each week, the students also visit a language arts blog in which they answer a question about their literature or activities during the school week using their "eighth grade paragraph" of 8-10 sentences as defined by Ms. Nelson. In addition, Noah liked to write stories on his own. He explained, "I like to create characters and go through a plot and try to figure out how to keep the plot moving." Serena, on the other hand, preferred "writing letters." She was enthusiastic about a project in her business technology class in which the students were "doing invitations for a Halloween party. The teacher wants to see how we write the invitation, so we're working on that."

Specifically addressing the writing act, Noah indicated that having laptops made writing quicker and easier because "you don't have to worry about spelling and ruining your grade for misspelled words." Over time, laptop access has enhanced his confidence as a writer. According to Noah, "your hand doesn't cramp up – you just flow through the keyboard. It's improved my writing because it tells you your spelling errors, and you realize later when words are spelled wrong because you've seen them before."

Serena, conversely, expressed a preference for scripting over using her laptop. She felt "more used to pencils" and because her laptop is "occasionally broken or unavailable," she preferred to keep her notes in a note book to be certain she would always have what she needed. Though she appreciated the ease of using her laptop for research, Serena explained that she always used her paper first to brainstorm and draft before using her laptop to develop a final copy of her writing.

When asked about the benefits of writing by hand rather than using a laptop, much like Serena, Noah conceded that writing out notes was helpful to him. He liked the freedom of being able to draw special symbols or arrows and observed that writing information out by hand was helpful for learning because "it is like a light bulb (that) comes on when you get it." Regardless of the medium for drafting, however, Noah asserted that writing was more than just penning a report; rather, it was about "including images to give your work a nice look." Both Noah and Serena liked the ease in which laptop access enabled them to illustrate their writing. Serena confessed, "I'm not a good artist, so when I type my assignments, I can add the pictures that I like, and since I can't draw, that's really helpful."

Overarching Themes

Purposeful conversations with teachers and students about their instructional activities often reveal a wealth of information detailing "the state of the classroom," and this study's findings proved no exception. While each participant offered a unique combination or balance of TPACK knowledge, with occasionally singular ideas concerning writing instruction in the 1:1 setting, there was considerable overlap relating to the challenges and other noteworthy aspects of ubiquitous computing classrooms.

Once the interviews, document collection, and observations were completed at both sites, all information was entered into the computer, printed and closely scrutinized over a period of several weeks. Three primary sources of information – interview transcripts, observation notes, and instructional materials – were repeatedly examined and coded judiciously. Cross-analysis of documents and teacher and student accounts at both sites yielded three overarching themes:

1. Engagement versus Distraction: A Fine Line in the Middle Grades ELA 1:1 Setting
2. Power Down and Pick up a Pencil: Laptops as ONE Aspect of the Writing Classroom
3. The Not-so-Subtle Influence of Teacher Values on Writing Instruction in the 1:1 Environment

The discussion of these themes that follows is based on close analysis of the interview transcripts, observation data, and related instructional documents. All direct quotations included as part of each theme's exploration originate from interview or observation data.

Theme One: Engagement versus Distraction: A Fine Line in the Middle Grades ELA 1:1 Setting

Multiple studies point to the increased engagement that students and teachers typically experience in the 1:1 laptop environment (Frey & Fisher (2010), Lowther et al. (2008), MacArthur (2006), Warschauer, et al. (2010)) as compared to non-laptop enabled settings. Instant access to a wide variety of information, interesting software and hardware applications, and enhanced methods of communication are among the touted benefits. Ubiquitous access to these same attributes, however, has a secondary impact, particularly in this study's middle grades English language arts classroom. The very tools that capture student interest for enhanced learning also serve as ever-present distractions for a considerable number of adolescents.

When queried about challenges in the 1:1 English language arts setting, every seventh grade student participant touched on distractions. For example, though not a "computer freak," Derek admitted he found it hard to pay attention sometimes, and his classmate Kierra agreed, noting "I have trouble staying focused sometimes." Student focus group participant Mike observed, "Some kids decide that school isn't their thing, and they go to different websites – they find loopholes (to the system) and do what they want." Their classmate Bryan estimated that at any given time during class, about "70% of the boys are off-task." Derek chimed in with his assertion that "the teachers don't crack down on the 50% of

students who are off-task." The student focus group participants agreed that off-task behaviors are a problem with Sarah grousing, "It's awful when you have kids messing around with the laptops during school hours, and you lose some of your privileges, and then you can't do your work." From the students' perspective, technology knowledge often outweighed interest in content activities among classroom participants.

The teachers at ENCMS, the first school in the study, were not oblivious to the challenges the students discussed. Ms. Smith, the self-described "late-bloomer" to teaching, at ENCMS longed for another adult in the classroom to help her with monitoring as "the children do tend to wander." She further remarked that it would be nice to observe all the children at one time on the laptops. While there was a staff member in the technology lab with the capability of monitoring all laptop activity at the school, Ms. Smith acknowledged that keeping up with the activities of 800 laptop users was "very hard."

Ms. Baker, the teacher with a military background, echoed Ms. Smith: "The number one challenge is monitoring – monitoring where the students are and what they're doing (online during class)… That's a big thing (for teachers in the 1:1 setting) – management." She commented that she was still working through ways to "make them (the laptops) most effective". Her goal was that students would glean something from their laptop learning experiences rather than just "use them."

Ms. Young, the teacher with a self-professed passion for teaching writing, also worried about distractions among her students, noting, "The one thing is to be sure the kids are doing what they are supposed to be doing because they do have access to a lot of things." She explained that the kids were very smart about finding "ways to things that they should

not be on." She cautioned, "You've got to watch – it's like they know the back door – how to trick you and try to hide it from you. The boys are more risk takers and will try to go to games and things they shouldn't go to."

Just as at ENCMS, the teachers at SWNCMS middle school described student distractions as an obstacle in the 1:1 writing classroom. Ms. Nelson, the energetic teacher starting her third year in the classroom, asserted, "We still have distractions – instead of doodling on paper, they're going to a website and playing a game. You really have to make sure they're focused all the time – that's why I'm constantly moving around the room to keep my eye on them, to keep them on task. The girls like to do social things like *Pinterest*, while the boys like to play games." Ms. Thomas echoed her colleague's account, noting, "They all get distracted a bit – the boys by the games, whereas the girls are more about the pictures."

Noah and Serena, eighth grade students in Ms. Nelson's class, weighed in with similar perspectives. Serena explained, "Sometimes people don't follow what we're on... If they don't understand what they are supposed to be doing, they'll play games, or if they're finished, they go on games, even though they're not supposed to." The students estimated that at any given time, roughly 20% of their classmates were using their laptops to do something other than the given assignment. Noah surmised, "They're (the off-task students) getting more savvy."

Observations indicate distracted or off-task students during instructional time at both ENCMS and SWNCMS. In one SWNCMS classroom, at least one student spent 15 minutes or more sitting idly looking around the room and trying to initiate his peers in conversation until he received sustained attention from the teacher, who was able to engage him in the

activity being completed. Though he seemed to work on the assignment briefly, he did not remain focused for more than a minute before he stopped working and resumed his efforts to distract his neighbors from their work. A second student in that same classroom showed pictures of some sort to his neighbors until visitors entered the class and made their way around the room. As they strolled past the young man's seat, the assignment was on his screen by that point, and he grinned amicably, seemingly pleased to be seen working on the given assignment.

In a classroom at ENCMS, students were asked to respond to short answer questions about the novel they were reading in an online format akin to an educational version of Facebook. Several students worked diligently, while others did not immediately access the assigned site. Instead, they talked quietly or visited other sites as Ms. Smith worked near her desk on grading-related tasks, apparently unaware of the quiet, but nonetheless off-task behaviors.

There seemed no doubt, then, that students typically appear engaged, on-task even, when using their laptops during class regardless of the authenticity of their activities. Ms. Smith offered a potential explanation. She observed of her students, "They're proud of their laptops. To many of them, that's their laptop. That's how they feel, and they're really lost without it." The students enjoyed having laptop access a great deal. Despite the intensity of the students' feelings, she acknowledged that "Laptops are a great tool, but they should not be used all the time." Ms. Smith explained that teaching writing and specific steps of the process required her students' full attention without the potential for the distractions or off-task behaviors associated with laptop use in the classroom setting.

Ms. Thomas also discussed student pride concerning her students' laptop activities. She noted, "We're using their tools and allowing them to express themselves in their writing and learn from them. They're proud of the fact that they know how to do things (with their laptop). Middle school can be very cliquey, but the laptops have helped us to get away from that. A student may raise their hand with a problem, and someone from a very different group will say, 'I can help her', and nobody judges them." Ms. Thomas revealed that this behavior made the classroom more professional, perhaps even reducing the potential for social distractions in the instructional setting.

Interestingly, there was a contrast between Ms. Thomas' and Ms. Smith's classes in that the vast majority of Ms. Thomas' students have 24/7 access to their laptops while very few of Ms. Smith's students have the same opportunity for full ownership. Ms. Smith's team was the same student group who Derek and Bryan estimated that at any given time, 50-70% of students were not on-task during 1:1 learning time. Ms. Thomas, by contrast, had little concern with distractions in her classroom. ENCMS student Owen hypothesized that the students who had ubiquitous (24/7) access to their computers "pretty much respect that right now (at school) we're doing this on our laptop, and they know that you can use your laptop at home for the other things that you want to do." His ENCMS schoolmate Bryan reminded us, however, that "some students don't get to take their laptops home because they don't pay the insurance fee." He asserted, "It's better for everybody to have it (laptop access) 24/7."

Yet, not everyone in the 1:1 communities agreed with Bryan. Ms. Nelson at SWNCMS explained that people in her district who were unfamiliar with the laptops or parents of students who were not successful in school were typically against laptop access.

She viewed laptops as an easy target because of the potential for distractions. Occasionally, she worked with students whose parents refused to permit their children to have a laptop because they did not feel their child would use the laptop primarily for educational purposes or would seek access to inappropriate material. There were still other parents who for financial reasons did not enable their child to have laptop access. Lacking 1:1 laptop access was particularly difficult for the students as Ms. Nelson believed they "could not complete the same assignments or engage in the same activities. They felt like they were really missing out on some fun activities." Serena agreed with her teacher's estimation, also noting that lacking 24/7 access to a laptop contributed to the predicament of some of her classmates missing deadlines to submit online assignments. Students with laptops, in Serena's estimation, seemed to take greater responsibility for getting their work completed, particularly with online learning systems such as the one in place at SWNCMS.

Regardless of user status – day use only or 24/7 privilege – students and teachers in this study unanimously agreed that, despite the ongoing challenge of distractions, having instant access to such a tremendous amount of information was exciting, convenient, and empowering for the writers and the writing classroom. Though some students lamented that having a new teacher in one of their core classes meant that they did not use the laptops "as much as they did last year," the majority of students at both schools reported they had the freedom to complete assignments with the resources that they needed. Even the difficulty of managing the subsequent distractions that such freedom engenders in 1:1 classrooms at both schools, all of the teachers expressed that laptop access in the writing classroom was a major benefit.

Whether emphasizing curriculum over pedagogy or matters of pedagogy prior to curriculum, each teacher's unique balance of TPACK revealed an appreciation and value of technology for enhancing the quality of writing instruction for students. As perhaps could be expected, there were some differences in the types of laptop-enabled activities and applications utilized among teacher participants that were naturally influenced by their personal TPACK. Concerns over classroom distractions and the numbers of instances observed, as a result, varied among participants. Nonetheless, three of the five teachers firmly asserted that they would not be able to "step backward" to teach writing in a non-laptop environment. It was clear that the convenience, creativity, and collaboration permitted by ubiquitous computing access was simply too valuable for them to abandon.

Theme Two: Power Down and Pick up a Pencil: Laptops as ONE Aspect of the Writing Classroom

For school communities new to ubiquitous computing access, the temptation to use the computers as frequently as possible is often significant. After all, with so much invested and the many promising resources now at one's fingertips, why would classroom teachers not seek as many opportunities as possible to engage students in laptop-enabling activities?

Interestingly, in each of the five classrooms observed as part of this study, the laptop did not function as the sole instrument utilized for writing instruction and practice. Knowledge of technology tools and practices did not lead to the abandonment of more traditional writing practices. In addition to daily 1:1 access, every classroom featured a set of standard hard-back or wire bound notebooks that the students used regularly, though for distinct purposes. Ms. Smith's seventh grade students at ENCMS used their notebooks as

journals. They began each ELA class writing in these journals a response to a prompt posted on the whiteboard. Personal in nature, the prompts asked students to express themselves freely; Ms. Smith provided handwritten feedback within the next week to strengthen teacher-student rapport. She defended this perhaps "old-school" method explaining, "They'll share more personal things in a journal than they will on a computer when they know it may be printed."

In a related manner, Ms. Young used the notebooks as an interactive scrapbook for free writing and taking notes. She asked her students to bring in movie stubs, concert tickets, and other small mementos each week to paste in their notebooks as they wrote about the events, their other activities, or whatever was on their mind during the allotted time. The students could also write poetry or draw in their notebooks, which Ms. Young justified by noting, "If they draw, they have to tell me why they drew that picture – what about that picture is important? And that's hard to do with a laptop." An added benefit to multiple opportunities for free writing, the journal evolved into a written keepsake detailing each student's life over the course of the seventh grade school year because it contained an assortment of handwritten selections that described the mementos and captured the student's thoughts and ideas.

In Ms. Baker's classroom just down the hall from her ENCMS colleagues Ms. Smith and Ms. Young, students used their notebooks at the beginning of class to copy information from the whiteboard detailing types of analogies and recording examples of each kind. Once the students had approximately 10 minutes to copy the information, Ms. Baker read each example from the whiteboard, offering further information for each analogy and leading the

students in a short discussion of each type. Interestingly, there was one student who was unable to locate his notebook where the others were kept, so he spent nearly 10 minutes looking in his desk and around the room for it as the other students copied diligently from the board. His search proved fruitless, so he did not record the notes anywhere. With his laptop sitting on his desk, it apparently functioned for him as a distinctly different tool rather than as a place for recording notes.

Similarly, the two SWNCMS eighth grade teachers, Ms. Thomas and Ms. Nelson, explained that their students' classroom notebooks were reserved for recording grammar notes and writing example sentences illustrating the concepts being described. These notes were later referenced for use during online grammar practice activities and as a review tool for quizzes. Though the notebooks were not used during the observation, examination of the notebooks stored neatly on a shelf at the back of each classroom indicated they had been used at least occasionally in the first few weeks of school.

Much like the use of written notebooks, teacher participants modeled flexibility among their strategies for carrying out writing tasks and the subsequent grading of the assignments. After Ms. Smith's seventh grade students at ENCMS finished their daily in-class recorded reading from *Roll of Thunder, Hear My Cry*, she posted short-answer response prompts to the events from the day's reading for the students to complete an online site called Edmodo. Ms. Smith explained that she liked the site because the students were sharing their thoughts and ideas about the reading in a format that their classmates could respond to. They could also take surveys and reading quizzes using *Edmodo*. "The kids like it because it looks like Facebook," she noted. Nevertheless, Ms. Smith recognized the limitations of laptop-

enabled writing. "It (the laptop) is an awesome tool, but it should not be something that we use all the time. If we don't have it (access) available that day or the Internet is down, we should not fall apart."

For lengthier, more in-depth writing assignments, Ms. Smith asked students to write their responses in class on notebook paper. On the second day of my visit, I observed her EC-inclusion students responding to an assigned writing task detailing their families' traditions. After explaining to the students that they should "Write about your family's traditions… What things you do year after year…" Ms. Smith then shared a bit about her own heritage and background before she moved to her desk to review grade sheets. Meanwhile, several students struggled to compose more than a few lines, with one student even having to move twice before throwing his pencil several feet away in frustration despite individual attention from the EC-inclusion teacher assistant. Fortunately, most of the remaining students were able to complete at least half of a written page, including Derek, who dashed off more than a full page of writing in the 15 minutes of time allotted for the response.

Of the five teachers interviewed, Ms. Young at ENCMS most adamantly addressed the evolving nature of classroom teachers' TPACK with her admission of a struggle of "fumbling around with the old-school idea of writing it (the paper) before you type it rather than just jumping on and starting to type." For an extended project of writing an editorial that took place during my visit, she distributed large note cards to students, asking them to devise their topic and supporting arguments in writing before proceeding to Pages to complete their final draft. I observed the students use their laptops during class to research

their topics and then record the facts that bolstered their arguments onto the notecard before going home to flesh out their ideas into a handwritten draft. The next day, they brought in these drafts and with Ms. Young's final quick review typed them into *Pages*, from which the writing would later be copied and pasted into *My Access* for grammatical corrections and grading for organization.

In a discussion of this process, Ms. Young stated that students need to organize their thoughts on paper before using a laptop to record their words. She explained, "I've got some (who ask) 'why do we have to write this first?' I tell them, 'You've got to organize it first, and then we can write it'; once they can type it, you see more interest and willingness to go and change it." With 17 years of ELA teaching experience informing her decision-making, Ms. Young trusted the process to the extent that she has trained her stronger writers to serve as writing buddies to exceptional children who have difficulty getting their thought process down on paper. She has found that students who struggle with putting what they are thinking into a handwritten format were more willing to talk to a peer about their ideas for a paper. The trained peer was then able to help their EC classmate by handwriting the assignment as the special needs student talked through his or her draft step-by-step.

At the start of her third year of teaching, Ms. Nelson at SWNCMS worked from a different vantage point from that of Ms. Young, who relied on nearly two decades of experience and her "gut instinct" to make teaching decisions that reflected some tension with technology, but nonetheless an enthusiastic embrace of its benefits. Though newest to the classroom in comparison to the other study participants, Ms. Nelson nonetheless relied on her established pedagogical knowledge and content understanding to espouse an intriguing blend

of traditional versus modern methods of handling feedback for her students' writing. She recalled, "When I was student teaching without 1aptops, I was taking home stacks and stacks of papers – it (grading) was tedious; laptops help with grading and assessing – now I can just read and see 'Okay, they are understanding… they have got the point." She stated that there was definitely a benefit to having students "write some things down." For instance, she observed that, since grammar is very complex, there was a need for "students to take notes, to write the sentences out, and then to practice (the concepts) using their laptops." She shared enthusiasm for an online resource called *SAS Curriculum Pathways* because "it points out where the issues are, but it doesn't show them how to correct the errors – that's the job of the teacher."

Part of the learning process for Ms. Nelson and her students, then, involved having the students "print off a copy of their final draft so that I can write comments on it." This practice, akin to Ms. Smith's habit of responding regularly in writing to her students' handwritten journal responses, served as a means of building rapport and demonstrating care for the students' written words in a manner that online feedback seems to fall short of accomplishing.

Ms. Thomas reinforced the views of her English language arts colleagues with her assertion that "Some things in our classroom still need to be done on paper with pencil." She explained that her students used their notebooks to record grammar notes. Like Ms. Young, she identified a benefit of paper and pencil for organizing one's thoughts prior to writing. She explained, "When students are organizing or brainstorming and they want to do a bubble map or thinking maps, they may need to manipulate a pen and paper." In her estimation,

teachers needed to be flexible and willing to differentiate according to students' needs so as to make each one "a better writer, a better thinker, (and) a better creative designer." Students, for their part, needed "to see that the laptop is a great tool in the classroom, but that it doesn't have to have everything done on it." Extensive pedagogical and content expertise guided such a stance.

Theme Three: The Potentially Not-so-Subtle Influence of Teachers' Values on Writing Activities in the 1:1 Setting

Ottenbreicht-Leftwich et al. (2010) observe that the value systems teachers possess are "rarely included in conversations on best educational technology practices" (p. 1322). This premise merits consideration for attempting to understand the variation of writing instructional practices in 1:1 classrooms. Even when teachers receive a prescribed curriculum to follow or meet with a team of subject-area peers to plan instructional activities, the actual lessons carried out in each classroom reflect to some extent the individual teacher's values concerning pedagogy, content, and technology use. The activities taking place, then, may vary somewhat from the published curriculum or posted lesson plan for the team.

In Ms. Smith's ENCMS classroom, for instance, the students read *Roll of Thunder, Hear My Cry*, as all of their peers in seventh grade did, and then responded to short-answer questions about the relationships found in the book using *Edmodo*, the online educational site for student blogging akin to Facebook. Upon completion of this activity, the students wrote out by hand a description of their own family's traditions.

Perhaps as no surprise, family and relationships seemed to be of great importance to Ms. Smith. When assigning a journal topic about what the students would rather be doing,

she spoke of her son in class, "I would love to be home with my son watching *Aladdin* for the 500th time." Her student Kierra commented during her interview that that she and her classmates often "write about our families." During my interview with Ms. Smith, she explained a preference for having the students handwrite their daily journals so that they would share "better…more personal things." She explained her practice of taking the journals home each weekend so she could respond, noting the value of personal, handwritten feedback. With a demonstrated inclination toward meeting her students' pedagogical needs, relationships and a value of family, then, clearly influenced the activities taking place in Ms. Smith's classroom.

Down the hall in Ms. Baker's room, students recorded various types of analogies and examples in the same style of journal books that Ms. Smith's students use to respond to personal topics. Of teaching writing, Ms. Baker explained, "My goal is to teach students the difference between a formal language and an informal language." She felt strongly that "the students are engaged when the lessons are meaningful. The laptop is not a babysitter – it is strictly for instruction and it's a resource tool. It does not replace the teacher or good instruction. It's a tool to help you facilitate the best learning environment possible." Like Ms. Smith, her students used *Edmodo* to comment online to short-answer prompts based on the reading of *Roll of Thunder, Hear My Cry*. Introducing the activity, she stated, "One of our performance tasks is to analyze the relationship between characters. You will post and reply to a classmate. As you are composing your response, make sure you are in compliance and performing at the highest level." In her interview, Ms. Baker emphasized the importance of "teaching them (the students) how to read and write with each other." She circulated as

the students entered their responses, and offered several instances of positive feedback. Considering Ms. Baker's stated values and ideas, writing in her classroom appeared to be particularly important for communicating appropriately and effectively with others. This concern for content-based accomplishment guided the bulk of instructional objectives for Ms. Baker.

Ms. Young, ENCMS colleague to Ms. Smith and Ms. Baker, expressed yet another stance about teaching writing. With 17 years of experience and recent participation in the National Writing Project, one could not doubt her passion for teaching writing. She gushed, "Writing has always been my way of expressing myself, and when I went through the National Writing Project a couple of years ago, it just became one of those things that I love to teach. I would teach writing all day (if I could)." Concerning the types of writing she assigns students, she explained, "Anything that gets their thought process down on paper. They need to learn how to get their process down there, they need to learn different way to plan. I love the freewriting that I do with my journals – get their feelings out or whatever. I'll just give them prompts and say 'write the first thing that comes to mind'…" She went on to explain that she liked to use literature to teach writing as well as quotations, pictures, and anything the students might see in their everyday lives. She believed that laptop access had been helpful for her students' organization as well as increasing their word choice. She loved the immediate access to quality models of writing, the tremendous amount of information available, and the way that she could accommodate a wide variety of student interests and learning abilities. She noted, "I don't think I could teach without it (1:1 access) – I don't

think I could go to a school that doesn't have 1:1 now – It would be very difficult for me to teach something when I couldn't get them (the students) on a computer daily."

Ms. Young's three students participating in the student focus group discussion commented on the writing they did, expressing enthusiasm for free writing and the fun of researching topics they were personally interested in to write their editorials. Sarah excitedly shared, "I like to write about everything. It helps with learning things." Ms. Young's passion and values related to writing, her content area of expertise, have a positive influence on her students' perception of the task as well.

At SWNCMS, Ms. Thomas led a procedure-oriented eighth grade classroom in which students engage harmoniously to complete literacy-rich tasks that prepare them to excel on state assessments and more importantly, in life. Upon my arrival on the first day, I watched as she shook hands with each of her students as they entered her classroom before extending a hand to me, offering a brisk handshake. During her interview, she named a major goal for her teaching: "(You do) what is best to make (each student) a better writer, a better thinker, a better creative designer." Observations of Ms. Thomas' class indicate her appreciation for and emphasis on teamwork and collaboration. During my visits, she often reminded students, "Don't get ahead – you have to stay together." She admonished them, "Discussion is more important than you[r] typing your own thoughts." Of team tasks, she announced, "There should not be any silence."

When discussing writing activities in the 1:1 setting, she explained enthusiastically, "They (the students) are so willing to help each other. And middle school students used to be very clique-y as in 'I'm not talking to that group,' but the laptops have helped us to get away

from that – students may have a problem and raise their hand, 'Who knows how to do this?' Another student will say, 'I can help her." They are from two very different groups, but nobody judges them – They are proud of the fact that they know something. Makes the classroom more professional…" Writing with Ms. Thomas, then, becomes for students an act stemming from rich discussion, collaborative meaning-making, and community input. It is indeed a promising method of preparation for writing in the professional world.

Ms. Nelson, the second study participant at SWNCMS, was drawn to middle grades teaching for the challenge as well as her love of the "reading, writing, and discussion aspects of language arts." Of writing instruction, she explained, "We do free writes, journal entries, any sort of response to a novel… We try to do a lot of writing because it's so crucial to their (the students') development. We try to have them create their own writing as they go to get to the higher order of Bloom's." Ms. Nelson clearly values challenging and engaging the students' thinking to exercise their critical thinking skills. Discussing 1:1 access and writing, she noted, "Laptops can be a great tool for writing – They've helped with editing, grading and assessing, and increasing student engagement because of the variety of things you can do… They add a lot to the creativity aspect."

Observations of Ms. Nelson's class indicate her commitment to creative lessons and active student engagement. On the first afternoon of my visit, the students sat riveted as Ms. Nelson read from the class novel, *Tears of a Tiger*. Every page or two, she stopped to ask, "What can you infer from…?" Ten minutes later, there was a collective groan from the students as she closed the book and announced that they would continue reading the next day. The class then transitioned into a three-part rotation activity with Ms. Nelson and the

Exceptional Children's inclusion teacher facilitating two of the three groups. In this manner, the students received small-group instruction for two-thirds of their rotation time.

Throughout the class, students were engaged, with only a couple of individuals ever witnessed to be off-task. As they wrote in response to the reading, at one station penning descriptions of the characters, while another discussed the importance of point of view, their fingers flew across the keyboards, words and then sentences filling the laptop screen. The students' enthusiasm for their learning quickly took shape in a way that reflected not only higher order thinking but perhaps more importantly, engaged writers actively crafting meaning for themselves and the world around them. Ms. Nelson explained this, noting, "We try to do a lot of writing because it's so crucial to their development." Her desire to have her students actively participate in their learning process and engage their critical thinking skills is clearly evident in her classroom dialogue, with frequent requests for "What can you infer?" sprinkled several times throughout the reading. Her regard for engaging students was also apparent in the way she chose to arrange classroom activities so that each class had the maximum amount of student-teacher interaction, as evidenced by positioning her EC inclusion partner as a leader of one of the three rotation activities on the first day of the visit. Ms. Nelson's pedagogical and content knowledge thus guided the bulk of her instructional planning decisions. She modeled her vision of education as challenging, engaging, and above all, student-centered with her assertion, "Every day is a challenge, but it's a good challenge. That is a big motivation for me to teach middle school." Her love of a good challenge, then, clearly encompassed the desire to challenge her own students.

Summary of Findings

This chapter detailed the data collected as part of a multiple case study of writing instruction in five English Language Arts classrooms with 1:1 computing environments at two middle schools. Detailed portraits of the five participating teachers, eight of their students, and their two respective schools were provided, and findings that address the study's research queries were shared. Rounding out the chapter was a discussion of three prevalent themes that surfaced among the cases as a result of close analysis of interview transcripts, observation data, and related documents. Chapter Five offers a discussion of the findings, answers to the original research questions, implications of the findings for English language arts practitioners, and suggestions for future research.

CHAPTER FIVE: DISCUSSION, IMPLICATIONS, AND SUGGESTIONS FOR FUTURE RESEARCH

Introduction

This multiple case study was initiated in an effort to understand the nature of writing instruction as impacted by 1:1 laptop access in middle grades English language arts classrooms. Employing qualitative methodology, the study explored five middle grades language arts teachers' perspectives on teaching writing with 1:1 access and further examined eight of their students' ideas about writing instruction. In addition, the researcher spent nearly 30 hours observing the teachers' and students' classrooms to better understand how writing instruction is being delivered in the 1:1 setting. Teacher participants were fully-certified instructors with a minimum of two years' teaching experience, the average of which for all participants was 8.5 years.

The guiding query for this study read, How are teachers' pedagogical strategies for teaching writing influenced by their students' 1:1 laptop access? Sub-questions posed include

1. What challenges do teachers and students experience concerning writing in 1:1 laptop settings?
2. How as 1:1 access changed the nature of writing activities and the use of instructional time for the writing process? and
3. How do 1:1 environments impact writing process?

This chapter includes a discussion of the study's prominent findings as they correlate to the research questions described in Chapter Four. In addition, the discussion offers potential implications of the findings for English language arts professionals as well as suggestions for future research.

Discussion of Findings

Children and technology tools go hand in hand. Today's young people are born into a world where they are surrounded by home computers, portable laptops, I-pods, e-readers, handheld tablets, and myriad other technologies everywhere. Our children are, as Marc Prensky (2001) notes, digital natives, and it was only a matter of time before their learning experience at school would be considerably impacted by technology tools and applications.

The advent of technology in schools was initially slower than might be expected because of the expense. During the 1980's and 1990's, computers were several thousand dollars apiece, and schools found themselves challenged to assemble a lab comprised of 30 or so desktops or alternately to put one computer in each classroom. Over time, computers became less expensive, more portable, and better suited to learning environments. As a result, many schools and districts can presently afford to provide 1:1 laptop access for their students. They often choose to do so based on positive reports of increased student engagement and achievement from studies of early adopters (Corn, 2009; Penuel, 2006; Silvernail & Gritter, 2009).

As with any innovation, however, training of personnel proved crucial to the success of laptop implementation. It was one matter to provide laptops to students and to train educators in the machines' operation and daily maintenance; quite another issue was

developing teachers to seamlessly integrate the technology tools as part of their specific curriculum area. Various studies (Garet, 2009; Holcomb, 2009; Morrison, 2009; Penuel, 2006) subsequently demonstrated that many teachers felt they had received inadequate training to fully utilize laptop technology for effective daily instruction. Looking specifically at writing, it was troubling to discover that research on writing instruction and writing evaluation has actually declined in the last 15 years. In a time when technology tools are at an apex in the school environment, it is worrisome that research on effective methods for delivering the writing curriculum is waning. Apprehension regarding this lack of research prompted my interest in studying writing classrooms utilizing 1:1 laptop access.

Looking back through the history of schooling, teachers generally made decisions concerning their classroom activities based on their understanding of the information they were responsible for conveying in conjunction with their assessment of students' developmental needs. As technology has come to play an increasing role in classrooms across America, particularly 1:1 laptop access, teachers now must take into account a third component of instruction: technology applications. Mishra and Koehler (2006) describe this integration process as a teacher's TPACK, or knowledge of technology, pedagogy, and content as interwoven aspects necessary for planning instruction. Using new methods and resources inherent to technology naturally increases the complexity of teaching and learning. Levels of success balancing the three areas of pedagogy, content, and technology diverge among the teachers charged with the task, and personal preferences or strengths within certain areas understandably lend to the variability found in classrooms today.

The overarching purpose of this study, to determine teachers' pedagogical strategies as influenced by their students' 1:1 laptop access, was supported by three relevant issues regarding the challenges teachers and students encounter in the 1:1 setting, the changing nature of writing activities and the use of instructional time for the writing process in a ubiquitous computing environment, and the impact of 1:1 access on student writing process. To answer the primary question of this study, a discussion of the sub-questions follows. Certainly the challenges for teachers and students inherent to a 1:1 laptop setting as well as the evolving nature of writing activities and the use of instructional time in combination with the impact of ubiquitous computer access on student writing process has had a major impact on teachers' pedagogical strategies.

Challenges with Writing Instruction in the 1:1 Setting

As described in the review of literature concerning 1:1 programs and writing instruction, picture-perfect scenarios in schools are rare, with Penuel (2006) further cautioning that there is little clarity concerning the potential of 1:1 access to enhance core subject performance. Both Grimes (2008) and Holcomb (2009) remind educators that 1:1 success depends largely on local conditions and how a teacher decides to utilize laptops in the classroom. With such ambiguity, it is understandable that difficulties do emerge for teachers and students alike in the 1:1 writing environment.

A significant challenge in the 1:1 setting cited by teacher and student participants alike related to the presence of distractions for students. Each of the five teachers and eight students mentioned, during their interview and focus group discussions, classroom or personal distractions. In addition, distracted students were observed first-hand during several

classroom visits. Off-task activity included browsing images, playing games, visiting alternate websites, and surfing *Pinterest*, a social media site for idea-sharing.

While many studies confirm the existence of distractions in the 1:1 setting (Corn, 2012; Holcomb, 2009; Penuel, 2006; Wilson, 2005), few discuss how teachers and students manage such distractions each day. Aside from Ms. Smith, who suggested additional personnel in the classrooms, no other study participants offered any solutions to curbing or eliminating distractions. Students and teachers alike expressed frustration, even aggravation in some instances, yet there was a certain amount of resignation as well to the inclusion of distractions. Some students, including Kierra, Mike, Sarah and Serena, proposed that those most vulnerable to distraction had decided "school was not their thing" or perhaps did not understand the assignment. Bryan, alternately, suggested that students without 24/7 access to their laptops were more likely to be distracted because of the limited amount of time they were given to use their computers.

Observation and participant interview data support the likelihood that certain students may experience a greater inclination toward distraction than others. For instance, a student who has difficulty paying attention in class without having access to a laptop is likely to continue to have the same difficulty with ubiquitous access. Increased student engagement is generally a proven attribute of 1:1 programs (Warschauer, 2005/2006; Corn & Emer, 2010), but the engagement is not necessarily always with curriculum activities. Without stringent monitoring software or consistently vigilant teachers, students engage themselves in numerous non-academic activities. The long-term impact of frequent off-task activity in the classroom is not likely to be positive.

In addition to distractions, teachers in this study often cited grading and providing feedback for online writing as secondary challenges in the 1:1 setting. While some teachers, including Ms. Baker at ENCMS and SWNCMS's Ms. Thomas, had found singular processes that worked well for them that substituted editing symbols for highlighting or other computer-capable functions or used paper to align with online text, the three other teachers struggled with providing the personal or in-depth feedback that they felt was appropriate for their students within an online context. Ms. Smith at ENCMS, as a result, required most of her seventh grade students' writing to be completed on paper, while SWNCMS's Ms. Nelson instructed her eighth grade students to print their longer writing assignments on paper to give her a place to provide written feedback. Despite the presence of online grading software and programs, these teachers preferred to be able to scribe their comments for a "personal touch" as Ms. Nelson suggested. None of the student participants mentioned a preference or inclination for any specific kinds of feedback from their teachers, though they generally spoke positively about the types of writing they were doing in class. This finding was particularly heartening, considering the Lenhart, et al. (2008) finding that fewer than one in five students enjoys school-assigned writing tasks.

Tertiary challenges inherent to the 1:1 setting cited among teacher participants include the gap of technology prowess between students and their teachers, equipment reliability, and issues of varying access among students. Teachers and students alike observed that the vast majority of students were knowledgeable about their computers and online applications, with some students being cited by Ms. Young and Ms. Nelson as "savvy" or "knowing about the back doors." The teachers, then, were challenged to stay

ahead of the students' technical prowess to anticipate the impact of their activities on the classroom setting and plan accordingly.

Interestingly, each student cited some technical challenges concerning their laptop use. While many of these difficulties resolved over time with experience and opportunities for practice, students maintained that navigating new applications or websites, dealing with school-based restrictions barring some helpful sites, and frequent reliance on keyboarding posed a fair share of headaches. In addition, student focus group participants confirmed findings from Russell, O'Dwyer, Bebell, and Tao (2007) that teachers new to a school setting use technology less frequently than their more established colleagues. Though this reticence could well be attributed to multiple factors aside from a novice teacher's still-developing TPACK or technology integration expertise, the frustration expressed by the students with this teacher was troubling considering that these adolescents were characterized by their teacher as compliant, motivated students; their obvious displeasure combined with similar reactions from several less compliant peers likely posed a negative impact that easily compounds the new teacher's first-year difficulties.

Finally, issues of varying access and equipment reliability garnered mention among study participants. Ms. Nelson at SWNCMS discussed the difficulty students without 24/7 laptop access had in completing their assignments and engaging with students on the assigned tasks. Her eighth grade student Serena echoed her concerns, indicating that students without ubiquitous access often missed deadlines to submit tasks online.

ENCMS student Bryan hypothesized that these students were also more likely to be off-task in class. His schoolmate Owen supported this notion by suggesting that most

students knew they could do whatever they liked on their laptops once they were at home, so it was easier to comply with the given tasks during the school day. Students without 24/7 laptop access, however, did not have the same freedom. In their research on laptop usage and student achievement, Shapley et al. (2009) found that student laptop use at home for learning and completion of homework offers the best indicator of student achievement scores. If this is indeed the case, then day users without computer access at home may be at a disadvantage for making strides in academic achievement. These students thus experience a double-jeopardy of sorts in that they do not have computing access at home for their work while also likely struggling more acutely with distractions once they do have access during traditional instructional time.

Prevalent obstacles in the 1:1 ELA setting among study participants thus included the student distractions during instructional time, feedback and grading methods for online writing activities, managing the student-teacher technology knowledge gap, and the navigation of student to appropriate use of online resources. While some of the difficulties resolve themselves with time and experience for teachers and students, certain issues such as student distractions and online navigation behaviors can be particularly vexing, even detrimental to the classroom environment if unaddressed. Should student participant estimates concerning their off-task peers be remotely accurate, then a considerable number of students every day are losing valuable learning time that cannot be regained.

Changes in Writing Activities and the Use of Time for the Writing Process

As businesses, social groups, and most every organization increasingly takes their modes of communication “online,” students must be prepared to read and write successfully

in such conditions. Author-teacher William Zinsser (2001) explains, "The new information age, for all its high-tech gadgetry, is finally writing-based. E-mail, the Internet, and the fax are all forms of writing, and writing is, finally, a craft with its own set of tools, which are words. Like all tools, they have to be used right" (p. xi). Though student writers in a 1:1 English language arts classroom may spend less time laboriously handwriting their essays or searching for the spelling of certain words in the dictionary, they must still grapple with various stages of the writing process. While some instructional practices have remained "tried and true" in this new learning environment, the teacher's TPACK (Mishra & Koehler, 2006) and choices concerning the use of time and the nature of writing tasks have necessarily evolved to meet student needs and curriculum demands.

For instance, ENCMS's Ms. Young, a passionate 17-year veteran in the English language arts classroom, observed that there was a "big push" to have everything created in a digital format. Five of the eight students in the study expressed a preference for using their computers rather than traditional notebooks to create text, with two students and Ms. Nelson at SWNCMS expressing particular enthusiasm for the creativity that ubiquitous computing access permits. Ms. Thomas, also at SWNCMS, summarized many students' inclination for creating via computing, stating, "We're using their tools and allowing them to express themselves and learn from them." This inclination fosters the engagement and student-centered appeal of 1:1 settings.

Concerning the students' ability to conduct research, another critical element of 21st century skills akin to creativity, laptops were crucial for student success. Ms. Young, like her fellow teachers and student study participants, appreciated the convenience of quickly

being able to access online different models of writing selections, ideas for writing, and quotations or statistics to enhance their message. Even Derek, a somewhat reluctant "day-user" of his laptop at ENCMS, admitted that he liked "instant access to information." For three of the five teacher participants, this "instant access" was so integral to classroom instruction that the teachers expressed that they would not be able to return to a non-1:1 setting to teach. Such a preference among experienced 1:1 teachers for ubiquitous access likely assures technology's staying power in the upper grades English language arts classroom.

Despite the teachers' appreciation of the 1:1 resource, every participant acknowledged to some extent the need for traditional paper and pen activities. Two teachers continued to have their students free write in journals, while four of the five teachers indicated they used notebooks for students to record notes. Handwritten activities among the five teacher participants generally appeared to be largely relegated to three occasions: when students were learning a new skill or concept that was perceived as complex, when the teacher wanted the students to free write or respond to informal prompts as a means of establishing a one-on-one written dialogue, and when using the computer was inconvenient or did not possess the tools or symbols necessary to facilitate the particular writing activity. As an example, Ms. Young at ENCMS had her students bring event programs, concert tickets, and paper menus from their weekend or extracurricular activities to class. She instructed the students to paste the items into their notebooks and write about the related activities. Her students also had the option to draw a related picture in their notebook with

the proviso that they would explain the significance of the drawing in sufficient detail. That type of activity, she surmised, "was hard to do with a laptop."

Interestingly, teacher values, a rarely contemplated phenomenon in K-12 educational settings, also influenced the types of activities and use of instructional time in the observed settings. Penuel's (2006) research demonstrates that when teachers believe technology can support student learning and provide tools that will add value to the curriculum, they will likely utilize the tools in their classrooms. This study, among others conducted previously, clearly supports that 1:1 settings provide teachers and students with access to many useful tools that support student learning and add value to curricular activities. As teachers' experience in the 1:1 setting widens, their technological-pedagogical and content knowledge (TPACK) increases, a development that ultimately enhances the learning experience for students.

In line with this finding, there was considerable variety in the way in which writing instruction occurred at the two sites among the five classrooms that were observed as part of this study. For some teachers, the laptops were reserved for short reader-response activities, while in other teachers' classrooms, the students stayed "online" throughout class completing a variety of short writing tasks. As part of Ms. Young's writing instruction, the students used a word processing program to make final additions and corrections to a draft that had first been written out by hand. As teachers deliver writing instruction in the 1:1 setting, values, then, apparently come into play perhaps more so than initially expected. Activities such as personal journals or free writing may be practiced repeatedly or emphasized over others. Students may be reminded and subsequently trained to behave or communicate in ways that

reflect a teacher's beliefs about communication such as when the students use online forums akin to Facebook for their literature discussion. Or perhaps a teacher who does not necessarily value or feel comfortable with a particular type of writing, such as the editorial that Ms. Young's students worked on, will avoid using instructional time to model the process and guide the students in the development of their own piece. Whatever the type of influence, values do have some bearing on a teacher's instructional methods, and ignoring the presence of such influence is counter-productive at best in a time when it is more critical than ever to assure that all students, regardless of their assigned teacher, receive meaningful and appropriate writing instruction.

Though both sites engaged in team planning to aid in the goal of equitable instruction, it was clear that each teacher employed a fairly unique methodology for her choice of handwritten versus typed writing activities. Teachers and students alike appreciated the many resources that 1:1 access afforded, but agreed nonetheless that there was "definitely a benefit to writing some things out" as Ms. Nelson at SWNCMS shared. The teachers' technological-pedagogical and content knowledge (TPACK) came into play as teachers determined which writing activities require scripting versus keyboarding. Ms. Nelson's colleague Ms. Thomas observed of students, "They need that balance with paper and pencil." The students agreed, articulating the importance of writing facts and ideas out to aid in their understanding of the material. And despite the ease of typing and ready access to many great resources available with the laptops, three of the eight students expressed a preference to write their work out by hand. Interestingly, two of these students were day-users at ENCMS, while the third student, enrolled at SWNCMS, expressed a bit of mistrust with her computer,

explaining she “felt more used to pencils” and had to deal with her laptop being “occasionally broken or unavailable.” She liked her laptop, but appreciated the security of her notebooks.

In addition, every teacher touched on the importance of flexibility to some extent when working with students of varying technical ability in the 1:1 setting. Certain students, they explained, needed to write assignments out by hand because of personal difficulty using a keyboard, while other students in Ms. Thomas’ and Ms. Nelson’s classrooms at SWNCMS were required to do little by hand so long as the technology was available at home for them to complete certain tasks that other students might be expected to write out. Demonstrating pedagogical-content knowledge, Ms. Baker explained, “You accommodate the students’ learning styles based on whatever their needs are.” So while flexibility and teacher understanding are clearly important attributes in a 1:1 setting, regardless of the preferred tool for composing, perhaps ENCMS student focus group participant Sarah summed matters up best, having observed, “I like to write about everything… It helps with learning things!”

Many of the writing activities teachers and students described and engaged in during study observations and interviews reflect Langer and Applebee’s (1987) suggestions for productive writing experiences for students. While some practices have been enhanced by laptop access, such as warm-ups, vocabulary story writing, and reflective responses, others remained more traditional, as when the teachers had their students freewrite or use notebook paper for personal journal responses. Still other teachers valued the use of handwriting for recording notes, exploring grammatical concepts, and practicing new skills. Each of the five classrooms studied demonstrated a balance of online and traditional writing activities, thus

affirming the dynamic nature of TPACK for each teacher as she navigated the activities best scribed as opposed to those enhanced by 1:1 access based on her personal knowledge base.

The students, described aptly as digital natives (Prensky, 2001), each articulated at least one way in which writing by hand was useful to them. Three of the eight students even preferred to write out information by hand as opposed to using their laptops to type. The key lesson, then, suggests the necessity of flexibility concerning approaches to writing instruction and practice. Students may be digital natives, but they recognize a need for traditional handwriting experiences as well. Teacher awareness and focused discussion about the influence of personal and professional values on writing instructional practices as well as necessary steps to meet student needs can thus serve to enhance the types of writing tasks and the purposeful use of time in the writing classroom.

The Impact of 1:1 Environments on Student Writing Process

Student writing process remains somewhat ambiguous in the K-12 world, and to some extent, in higher education. Teachers often know "what works" for many of their students, but readily acknowledge that the process is not the same for every child. Lenhart et al. (2008) report that a mere 17% of students surveyed nationally as part of a *Writing, Technology, and Teens* questionnaire enjoy school writing, while 60% of the same students surveyed believe that computers make them more inclined to edit and revise their writing. Potentially complicating matters, Dave & Russell (2010) concede that what a "draft" means today is considerably more varied, disjointed, and complex than ever before. Interestingly enough, nearly 50% of young writers still print out their longer writing assignments for editing purposes as part of the revision process. Even with 1:1 access, paper is apparently

"complementing and enhancing writing in even more complex ways" (p. 429). How, then, does ubiquitous computing impact student writing process for study participants?

Perhaps not surprisingly, 1:1 access impacts writing process for students in a variety of ways and along a continuum. Derek, a reluctant "day-user" at ENCMS, initially reported that 1:1 access had not impacted his writing process in any way, reporting, "None (no effect) at all – I've always been a good writer. I type when there are assignments due, but I prefer pen and paper because I can get done faster." Other students chimed in with a variety of commendations. They explained how much easier it was to have instant access to information, including a dictionary, and the freedom of no longer having to worry about poor handwriting. Noah at SWNCMS enthusiastically shared that he loved writing on his laptop because of "how you just flowed through the keyboard."

Other students were adamant about organizing their thoughts on paper first, and then developing their written draft online. Derek and Kierra at ENCMS, however, reserved typing for required online activities, preferring instead to scribe their thoughts as much as possible. A third student, Serena at SWNCMS, also preferred to use her written notebook to complete as much work as possible, noting that her laptop was sometimes unavailable. She trusted having a notebook more so than relying on her laptop for completing written work. Serena's perhaps unusual stance interestingly aligns with Phegley's (2005) discussion of student trust in relation to writing process and computing in that a student's background can influence students to have a more complex view of their computer than teachers imagine.

Teachers participating in the study touched on this notion of student-laptop interaction dynamics, noting the need for flexibility with writing instruction based on student

need. Ms. Thomas reported that she coaches her students to use their laptops to do "what's best to make you a better writer, a better thinker, a better creative designer…" She had seen an increase in the amount of writing her students would willingly do, and she believes the freedom to use "their tools" is the reason.

Ms. Young also suggested that her students wrote more willingly using their computers. She valued traditional paper and pencil for organizing and drafting prior to moving to the laptop for writing, and though her students sometimes questioned her insistence on the use of paper first, student focus group participants Mike, Owen, and Sarah acknowledged that the preliminary steps helped with their planning and subsequently facilitated their work on the computer.

Considering the collective input of teacher and student participants, it is clear that writing process has not changed in terms of difficulty with new technologies, though laptop access generally makes research, editing, revising, and, for some students, organizing more facile. Much akin to many complex learning opportunities, students and teachers ultimately must come to terms with the process that best meets their personal needs as writers. The flexibility that Ms. Thomas and Ms. Baker discussed is crucial for success in a 1:1 writing environment to permit each student the opportunity to find what works well; coming to this personal understanding will take practice and experience over time, but will yield tremendous long-term value in a society where writing is an increasingly prominent means of communication.

Adding to this need for self-discovery of one's writing process, teachers have a certain amount of autonomy regarding the types of writing activities in which they engage

students. While it is accepted that ubiquitous computer access can improve writing (Silvernail & Gritter, 2009), activities that are authentic, experiential, hands-on, and project-based (Lowther et al., 2008) will yield learning experiences that better prepare the students for the 21st century workplace. To aid in this preparation, teacher participants acknowledged the need for flexibility concerning the use of the laptops as part of the writing process. Some students and teachers, after all, continue to rely on pen and paper for the bulk of their writing process and activities. The goal for several of the teachers taking part in the study, then, was to maintain a balance of scribed experiences with computer-based activities. In this way, teachers actively use their evolving technological-pedagogical-content knowledge (TPACK) and confidence in their understanding to plan instruction that strives to meet every child's learning needs in the English language arts setting.

Teachers' Pedagogical Strategies for Teaching Writing as Influenced by 1:1 Access

Prior to the advent of technology in the classroom, teachers typically relied on their understanding of children and curriculum to plan instruction, a foundational theory initially brought to the educational forefront by Shulman (1987). Most educators agreed that at certain levels, one area might be emphasized over another, as evidenced by a focus on children's pedagogical needs at the elementary level and a subject area content-centered approach during the secondary years. As computers entered schools, then classrooms, and subsequently began to appear on each student's desk as in the 1:1 setting, teachers necessarily became responsible for taking into account a third area of expertise, technology use. The new combination of pedagogy, content, and technology knowledge was described and explained by Mishra and Koehler (2006) as TPACK. Just as individual teachers'

original application of pedagogical and content knowledge varied based on experience, personal values, and school climate, this study revealed that teachers in the 1:1 setting utilize a unique blend of TPACK in implementing instructional activities in their English language arts classrooms.

Collaborative planning, a facet at both case study sites, influenced the types of tasks that students engaged in, even significantly at one site, though classroom observations clearly confirmed the dynamic impact of a teacher's TPACK on the choice of activities and use of instructional time. At ENCMS, for instance, a teacher passionate about writing spent the majority of the three class periods that I observed engaging her students in writing process activities to create a newspaper editorial. During class, Ms. Young conferenced individually with students, guided small-group brainstorming with others, and circulated as still other students researched their topics or drafted reasons on a note card in preparation to write a draft, all approaches typically associated with writing process instruction.

One of her colleagues, Ms. Smith, did not use the observed class time to craft an editorial, but instead chose to engage her students in informal journal-style writing that she explained during an interview that she would read and respond to in writing later. In addition, after reading from *Roll of Thunder, Hear My Cry*, one morning she asked students to script a paragraph about their family's traditions. Most students were able to write several sentences after some initial though without much difficulty, with student participant Derek dashing off just over a page of writing. A few students, however, struggled to complete the task, with one student writing nothing more than the one sentence dictated to him by the teaching assistant circulating in the exceptional-children's inclusion setting. As students

wrote (or did not), Ms. Smith busily worked at her desk on progress reports that she had not been able to complete during her planning time because of a series of meetings earlier in the week.

A third colleague at ENCMS, Ms. Baker, also did not utilize observed time to have her students work on an editorial. Instead, the writing taking place in her classroom involved scribing notes about types of analogies from the board into a notebook and typing short-answer responses to the reading from *Roll of Thunder, Hear My Cry* into an online site called *Edmoto*. During the visit, there was no clear indication as to when the students would complete an editorial as described in the team's lesson plan.

In contrast, SWNCMS teachers, who also planned together each week, completed identical activities in each English language arts classroom during the visit with the only variation being the utilization of an EC inclusion support teacher in Ms. Nelson's room as a small-group guide. Writing activities observed in both settings involved responding to questions based on a newspaper article, recording quotes to describe characters from the story in a double-entry journal online, and exploring point of view. Teachers at this school both utilized traditional notebooks for scripting grammar notes and exercises. Content and technology decisions were collaborative, though some pedagogical approaches understandably varied to meet the needs of each teacher and the students.

In looking at both settings, clearly 1:1 access impacted the teacher's strategies for carrying out writing instruction. As discussed earlier in the chapter, teachers expect distractions for their students from having 1:1 access and do their best to offset them when assigning in-class writing activities. With the benefits of greater engagement and increased

quality writing that laptops engender (Warschauer, 2005/2006), these teachers were willing to cope with the distractions by more actively monitoring their students' activities.

The teachers in this study also demonstrated flexibility in enabling and responding to the various methods their students employed as part of their personal writing process. They permitted some students to scribe the majority of their writing, while other students were allowed to complete all of their writing process using laptops. Teacher and student participants alike agreed that laptops did not replace all writing needs, yet there is some variety among classrooms as to what activities continue to be scribed. For instance, four of the five teachers agreed that the process of handwriting is helpful for taking notes on complex topics such as grammar. In addition, two of the five teachers had their students free write or complete informal writing responses in a traditional notebook. A third teacher insisted on having her students print out their longer writing assignments so she could scribe feedback and make personal comments. As evidenced by the five teachers and their students in this study, writing via scribing and keyboarding form a balance that is unique both to the classroom setting and to the students themselves. While the variety of process needs in 1:1 settings is intriguing, there is an added level of complexity with which teachers must grapple as well.

Findings arising from this study also suggest that these writing teachers relied on their value system to guide the subtle day-to-day choices inherent to classroom activity. One participant was passionate about writing, while two others were student-centered in their approach. Yet another teacher valued professionalism among students. The teachers' act of coaching writing was clearly influenced by these values. Holcomb (2009) posits that how

teachers decide to utilize laptops is of great importance, and each teacher's expressed and implied values clearly impacted writing activities in this study.

Finally, teachers in this study demonstrated that 1:1 access influenced their ability to engage in the four C's of 21st century learning (Partnership for 21st century skills, 2003) which include collaboration, communication, creativity, and critical thinking. One-to-one laptop classrooms equipped these teachers with access to tools, applications, and activities that addressed each area. Ms. Thomas and Ms. Nelson at SWNCMS both discussed the creativity that their students expressed as a result of using "their tools" and further cited several recent projects in which the students were responsible for creating content and products to share with their classmates. Along the same lines, the ENCMS team demonstrated the use of communication in their writing classrooms through the use of *Edmodo*, the online website that permitted students to respond to teacher prompts and to one another's comments concerning their reading. In Ms. Young's classroom, students exercised critical thinking as they researched a variety of websites seeking quality information to support their position in preparation to create editorials. Collaboration took place in three of the five classrooms as students discussed their reading and writing activities and brainstormed ideas to enhance the quality of their writing responses. One-to-one access, then, clearly empowered the teachers to imbed 21st century skills into their writing activities.

While school systems across the country have implemented laptop programs in an effort to enhance writing instruction and student performance, it is evident that 1:1 access alone does not lead to brilliant writing or droves of accomplished student authors. Nor does it necessarily have a drastic impact on the methods by which teachers engage their students

in writing activities. Nonetheless, teachers and students alike appreciate the convenience of instant access to information, the ease of tools available for composing and editing, and the ability to engage in 21st century learning skills. They also acknowledge the challenges inherent to 1:1 settings, which revolve largely around ever present distractions, perhaps more acutely among disadvantaged students. While study participant feedback and data analysis procedures clearly support the assertion that 1:1 laptop benefits generally outweigh the drawbacks, much remains to be discovered about how best to utilize instructional time for writing in the 1:1 environment to yield the greatest gains and long-term success to develop children as accomplished student writers.

Implications for English Language Arts Instruction

One-to-one environments provide middle grades English language arts teachers and students with many exciting options to enhance writing instruction and process, as evidenced in my visits at ENCMS and SWNCMS. Teachers and students appreciate instant access to a wide variety of online resources to inspire and add to their knowledge base, numerous software applications to ease the editing and revision process, and helpful tools to enhance student organization and feedback processes. Yet, the very tool that enables so many exciting activities also causes teachers and students a formidable challenge in the form of distractions. All participants of this study – teachers and students alike – discussed the struggle of managing distractions in the 1:1 setting. As a result, it seems fair to assert that new and experienced teachers alike would benefit from ongoing professional development concerning distraction management in the ELA classroom. The demands present in the 1:1 environment take classroom management to a new level, and even schools that invest in

monitoring software experience the difficulties of students who are technologically-savvy and thus able to stay ahead of the constraints imposed. As Hervey (2011) reminds educators, teachers need guidance and opportunities to discuss their best practices for monitoring students to keep them focused and on-track. Administrators and site-based technology specialists can alleviate potential frustrations by providing appropriate training for new applications when possible, offering keyboarding for students who need it, and ensuring a quick turnaround for access to helpful websites for research.

In a similar manner, teachers would also benefit from ongoing professional development for new tools to enhance instruction as well as frequent opportunities to share best practices for creating actively-engaging and challenging activities using 1:1 resources; otherwise, 1:1 instruction is compromised (Penuel, 2006). Without regular opportunities for professional development provided by trained technology specialists, teachers may be unaware of or lack understanding of the functionality of helpful tools and strategies to aid in providing meaningful instruction in the 1:1 setting. Along the same lines, students in this study lamented the difficulty of finding quality sources of information to use for their research assignments, and their teachers worried that the children did not understand the difference between trustworthy websites and less reliable resources. Ongoing updates and discussion concerning quality online resources for information that are age appropriate for student research and writing purposes would be valuable for teachers; in addition, strategies for teaching the requisite combination of fact-finding, organizing, and synthesizing information from various sources that students are expected to master would empower teachers to more aptly plan writing instruction in the 1:1 environment. In this way, teachers

would have the tools necessary to provide suitable up-to-date support for their student researchers.

A third implication based on this study relates to the variability of laptop use in the middle grades ELA classroom. The study indicated a range of activities that remained handwritten, with other types of writing exercises benefiting from word processing applications. Teachers often rely on a combination of their personal value system about matters of teaching and learning, a rarely-discussed aspect of decision-making in terms of educational technology practices (Ottenbreicht-Leftwich et al., 2010), and their collaborative efforts with colleagues to determine the balance of paper and pen with keyboard-based writing activities. In addition, the amount of class time spent engaged in laptop activities varied widely with some classes spending a few minutes using their laptops each day to others that did not once "power down" during a 65-minute session. Focused conversations among site-based PLC's and subject-area specialists concerning the decision-making and values of individual teachers would shed important light on these facets of the 1:1 setting and likely enhance instructional practice in technology.

Yet another important implication for consideration relates to the differing levels of access that students have at many 1:1 schools. In systems in which a family's finances dictate their children's access to a laptop, often rendering them restricted to day-user status or perhaps even without any laptop access, data from this study support the potential for an achievement gap between the have's and have not's being perpetuated. The reality of this disparity conflicts sharply with Harris's (2010) assertion that poverty-stricken students and their families have "the most" to gain from ubiquitous 1:1 access. Delving still further,

students without ubiquitous access to a laptop potentially have a greater likelihood of battling distractions in the instructional setting than their 24/7 connected peers. Teachers must be aware of the travails such a scenario poses for limited-access students and adjust their instructional strategies accordingly to provide necessary support and opportunities for success for these students. Awareness and discussion of such potential disparities can only better enhance their response to students coping with these circumstances.

A final area for instructional implication involves the impact of perceived audience for student writers. While practitioners traditionally view the presence of an authentic audience as a means of enhancing student effort and writing (Graham et al., 2007), study findings suggest that it is also possible that the promise of an audience for one's writing may instead serve as a drawback for certain students, perhaps making them reluctant to write about their personal views. Discussion among English language arts professionals and school communities to discern this possibility in light of the needs of student communities may inspire reflection and a more concerted effort to plan instruction and opportunities for practice that are more aptly-tailored to the needs of learners within various cultures and communities.

Suggestions for Future Research

This study captured a snapshot of the writing activities taking place in five classrooms at two schools in which 1:1 access had been a feature for four or more years. Five teachers and eight students shared their expertise and impressions concerning writing in the middle grades English language arts classroom. While some meaningful details came to light, including the ongoing struggle of distractions, the varying, but nonetheless

interdependent relationship of laptop to paper and pencil in completing writing activities, and the impact of teacher values on writing instruction in the 1:1 environment, there remain several unanswered questions that beg further investigation.

Primarily, English language arts practitioners need a better understanding of the physical act of writing and how it impacts learning and retention of information in comparison to the writing process as it takes place via the computer. Teacher and student participants alike commented on the necessity of traditional writing for note-taking and better understanding of complex topics. To maximize the potential for effective instruction, more in-depth comprehension of the role of physically writing versus typing is necessary.

In a related manner, teachers and practitioners would further benefit from increased knowledge as to how students organize their thoughts for a paper. Concerning this and other related cognitive matters, teachers are left to wonder if a one-size-fits-all approach is best, or if there is a true necessity for flexibility for students who may need to write traditionally as opposed to organizing their thoughts via word processing or by other technology-enhanced methods. Scholarly research in the area of cognitive issues and writing process would be both informative and valuable for 1:1 educators.

A third area of concern cited by three of the five teachers related to the need for providing feedback for student writing. The teachers pondered how best to provide meaningful feedback to students online. Considering Warschauer's (2006) finding that 1:1 access in successful classrooms leads to improved quality in written products, scholars need to investigate the possibility of online feedback as effective, less effective, or equally effective as the written comments inherent to traditional methods of grading writing, which

were often deemed dubious in value for improving student writing. With the potential for local conditions (i.e. teacher decisions) to effect a tremendous impact on 1:1 student achievement (Grimes, 2008), research investigating how teacher feedback should be handled online to be most effective for student writers would be beneficial to ELA professionals.

An intriguing matter also raised by teachers in this study related to the relationship-building potential that traditional handwritten journal notebooks enabled. Despite teaching in 1:1 settings for over seven years, two teachers in the study insisted on keeping traditional wire bound notebooks for their students to free write and record responses to light-hearted topics each day. One teacher remarked that her students would "share better when they physically write something – they will share more personal things in a journal than they will on a computer when they know it may be printed. They know I am only going to read the journal… I feel like it is a personal thing." An interesting study might explore the types of writing students of various demographics prefer as well as the impact of audience types – teacher or online - on relationship building and the development of teacher-student rapport. Since many teachers choose the profession to make a difference in the lives of their students, the results of such a study would potentially have great value to teachers and ELA researchers.

Another related area of research might consider personal privacy. For instance, do students indeed write "differently" online than they would on paper for their teacher as indicated by Ms. Smith in this study? Does the sense of audience, traditionally viewed as a positive for enhancing the quality of student writing, also function as a drawback for certain students, making them reluctant to write about their personal views? The results of a robust

study investigating various student perspectives on online writing versus in-class scripting could well inform future curriculum decisions and areas of emphasis for ELA teachers.

Finally, in considering the variety of themes and responses culled from interviewing and observing five teachers and eight students in various 1:1 writing environments, this study preludes an in-depth investigation of highly-effective teachers of writing as they actively teach the process. How does this type of instruction look – day in and day out – over an extended period of time? We know from the National Council of Teachers of English (2008) that writing is now taught less, yet we live in a time when it has and will continue to become more necessary than ever. How, then, are the highly-effective teachers accomplishing such a vital task? What are their secrets or "tricks of the trade"? A greater understanding of these practitioners and their strategies would be invaluable to future teachers of English language arts as well as those individuals currently experiencing the myriad challenges of teaching writing in 1:1 settings.

Conclusion

This study explored writing instruction in five middle grades English language arts classrooms at two 1:1 laptop schools. Five teachers and eight students consented to be interviewed so as to provide the researcher with a greater understanding of the teaching and learning taking place in those 1:1 environments. What began from a sincere desire to ferret out the best practices of 1:1 ELA teacher experts evolved into an appreciation and admiration of the passion and commitment required to make daily learning in a 1:1 environment both meaningful and engaging. Teachers newer and experienced struggled with managing distractions during instructional time, providing meaningful feedback for their students'

writing, and helping students navigate myriad learning needs. Yet, they gave their best effort and did so enthusiastically.

The results of this study indicate that there is no one "right way" to teach writing with 1:1 laptop access. Rather, teachers must first understand their students, determine the requirements of the curriculum, and plan activities – often including the available technology – that engage the students and lead to challenging and meaningful learning. These teachers frequently rely on unique methods to manage distractions, and they employ a balance of handwriting activities with online writing experiences. In addition, their personal value sets enrich the classroom environment in such a way that is perhaps understated, but nonetheless noteworthy. A teacher's TPACK, then is much more complex and multi-faceted than one might initially imagine.

This study adds to the existing understanding of writing instruction in the middle grades 1:1 English language arts setting (Nagin & NWP, 2003; Prichard & Honeycutt, 2006; and Warschauer, 2006) in subtle, but worthwhile ways. Primarily, the existence of student distractions in the 1:1 environment is ever present for experienced and newer teachers alike (Tagsold, 2012). Preliminary findings further suggest that distractions may be more of a challenge for students with limited access to laptops and those who may struggle to find school meaningful. In addition, teachers and students find various, often singular, methods of determining what writing activities to complete online versus those they reserve for writing out by hand. Sometimes this decision-making relates to teacher values concerning actively-engaging instruction, motivation from a love of the curriculum content, or gut instinct, while other times it may be based upon student need or preference. Whatever the

impetus, there is no exact prescription or determined formula addressing what activities are best reserved for traditional scripting as opposed to those that are assigned online, though several of the teachers increasingly made the connection that writing information out helps with comprehension and retention. Finally, the teachers belied in their mannerisms, interview responses, and classroom "talk" any number of discreet values that influence the types of writing activities engaged in as well as the overall climate of the classroom, thus customizing the learning experience for their students in ways that are perhaps incidental, but nevertheless worthy of further consideration.

In moving forward, much work remains to be done in our field. Writing as a valuable skill needs passionate advocates who will continue to see that it is not lost in the shuffle in favor of "tested" subjects, as one of the participating school's principals lamented when she remarked, "We like to see writing taking place, but since it is no longer a tested subject, it does not get as much emphasis." In the great push for enhanced literacy and *21st Century Skills*, we are remiss to pursue these areas without including writing as a major component of both. With the advent of the Common Core curriculum in the vast majority of our nation's schools, writing is rightfully poised to become an activity engaged in across all content areas as opposed to being largely confined to English language arts settings.

Yet, writing is admittedly not easy to teach, learn, or evaluate for English language arts professionals, much less for their other-content area peers; this is particularly true in a time of transition when little research has been conducted that provides "tried and true" best practices in the 1:1 writing classroom. This learning territory is generally uncharted; perhaps that is why many teachers shy away from instructing writing with any considerable depth.

Nevertheless, educators in all content areas enter the classroom to help students, and shirking on quality writing instruction because it is challenging and abounding in uncertainties is a grievous disservice not only to our students, but to the world of which we aspire to make a positive impact. We can do better, particularly in providing informed and purposeful writing instruction in conjunction with 1:1 access for our students, and we must strive to do no less.

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APPENDIX

Appendix A

Interview Guide for Teachers

1. Describe your experiences and motivation to teach middle school language arts, particularly touching on writing
2. What personal challenges and/or triumphs have you faced in implementing the 1:1 laptop program?
3. Describe your feelings concerning teaching writing with laptops. What concerns did you initially experience? How have these been resolved?
4. What types of writing assignments and activities do you believe are particularly beneficial for students? Please explain.
5. How has the writing curriculum evolved in recent years to accommodate laptop learning?
6. How do you believe that laptop access has impacted student writing overall?
7. How do you believe laptop learning has affected student motivation and/or engagement?
8. How do you feel the laptops have impacted your ability to meet the learning needs of each student? Varying technical abilities? Gender differences?
9. What has been your experience with students of varying technical ability?
10. What feedback do you hear from fellow teachers, the community, and students concerning 1:1 laptops and/or writing instruction?
11. What other information would you like to share that you think is valuable about your experience as a teacher of writing in a 1:1 environment?

Appendix B

Interview Guide for Student and Focus Group Interviews

1. Describe how laptop access has affected the way you write.
2. How do you use your laptop for writing assignments? Please try to be specific.
3. What types of assignments do you usually have to do? What types of writing do you enjoy?
4. What were your initial thoughts when you learned that you would have your own computer for class and home use every day?
5. What concerns or difficulties did you initially have with your laptop? How have these been resolved? What, if anything, is still challenging for you concerning your laptop?
6. How do you believe laptop learning has impacted your interest in school and desire to do well – make good grades, complete projects and homework, etc.?
7. How do you feel the laptops have impacted your ability to learn?
8. Explain what you see happening in your classes when students are using their laptops. Is everyone equally successful?
9. How do you feel having the laptops has impacted your writing ability? Are there still parts of the writing process that you do using paper and pencil?