

THE ROLE OF A HIGH SCHOOL ONE-TO-ONE LAPTOP INITIATIVE IN SUPPORTING  
CONTENT AREA LITERACY, NEW LITERACIES, AND CRITICAL LITERACY

by

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B.S., Kansas State University, 2001  
M.S., Baker University, 2004

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Curriculum and Instruction  
College of Education

KANSAS STATE UNIVERSITY  
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## **Abstract**

The purpose of this study was to explore participants' (teachers, students, administrators, and parents) experiences and perceptions regarding the perceived impact a rural high school's one-to-one laptop initiative had on content area literacy, new literacies, and critical literacy. Through a case study, data were collected through multiple sources and viewpoints to obtain an in-depth perspective of how this rural high school's one-to-one laptop initiative had perceivably impacted teacher's instruction to enhance student learning.

Data were collected and analyzed through a blending of direct interpretation and categorical analysis, presenting the following findings. The one-to-one laptop initiative's technology was utilized: (a) by student participants for academic purposes, personal efficiency, and recreational purposes, (b) by teacher participants for educational purposes, and (c) within content area instruction. Resulting from the access to laptop technology, this study documented the purposes of finding information for assignments, facilitating "just in time" learning, and stimulating schema about curricular content. Content area literacy instruction was perceivably effected because of the multiple textual formats the technology provided, and instructional occurrences were documented as developing vocabulary and fostering either content comprehension or reading comprehension. The new literacies and how they were implemented within the mathematics, language arts, science, and social studies classrooms were discussed. The role of critical literacy was presented in relation to students' sense of agency, and the power dynamic within various content area classes.

The majority of participants were documented having a positive perception regarding the one-to-one laptop initiative. Although integration of technology was occurring, there were opportunities lacking that could further develop teachers' instruction to enhance student learning.

When considering professional development within schools implementing a one-to-one technology initiative, administrative teams should: (a) consider what will be requisite versus elective technology integration tasks, and (b) ensure professional support is provided to teachers regarding integrating technology within their pedagogical practices. Additionally, teachers should instructionally integrate the technology tools and literacies that students currently employ. Pedagogically, this study implies that teachers must expand their comfort zones regarding content area literacy, new literacies, and critical literacy.

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Approved by:

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## **CHAPTER 1 - Introduction**

I am in 5<sup>th</sup> grade, 10 years old, reserved and shy. I am sitting in a big blue fabricated plastic chair that is too big for me, and ahead of me is a black screen. My school has just recently installed a computer lab in a room that was once used for storage. All of the classes are taking their turn visiting and using the new computer lab. Today it is our turn. My monitor comes to life . . . a little green blinking light in the upper left corner precedes the flash of letters and symbols signaling that my machine is booting up. As my classmates and I arrive at the opening screen, our teacher threatens that if we do not follow her directions exactly, we will lose our computer privileges for the day. We are given directions on how to precisely move from screen to screen through the different icons until we have accessed our program. The program consists of a little digitized worm-like creature that is constantly moving through a maze of lines. We are to hold our hands over the keyboard in a proper keyboarding position and use four keys to move our digital worm up, down, right, and left in order to avoid hitting the walls of lines. If and when we collide with these pixel barriers, our digitized worm returns to its starting position and slows down its pace. My classmates and I interact within this program for what seems like mere seconds before our time is up in our new computer lab. We'll return next month if time and scheduling allows. As far as my fifth grade perception is concerned, my school has advanced technology, but whenever we visit the computer lab I inevitably walk out disappointed with my experience.

I am a first year teacher, 22 years old, and a cosponsor of WJLB. WJLB is a student operated news program that airs every morning to broadcast the school's announcements, lead the pledge of allegiance, recite the school mission statement, share the daily weather and a fun

fact about that day in history, and tell a joke of the day. This news program is broadcast into each of our elementary school's classrooms. This news program is comprised of fourth, fifth, and sixth graders who have applied and demonstrated their leadership and reliability. Our news team rotates on a weekly basis allowing for many to participate. Positions within the broadcast include co-anchors, meteorologist, camera person, sound and screen, script writer, and director. Our equipment consists of video cameras, microphones, televisions, computers, a digital audio workstation, and editing software. The crew collaborates and cooperates to get the broadcast aired; constructive chaos often describes our environment. We have 30 minutes from the time everyone arrives until the bell rings that starts school, indicating its time for us to "go live."

I am 26 years old, the director and founder of a private preschool. We have 90 students from 30 months to six years of age and it is summertime. Our preschool is the only one in our area to have a summer enrichment program. One of our classes is a computer class, hosted in our computer lab with five desktop computers. This session I am teaching and have 10 students ages four to six years old. Each computer hosts two students who take turns "driving" and "co-piloting." The drivers are in charge of manipulating the mouse and keyboard. The co-pilots help the driver navigate, problem solve, and provide general input. These collaborative roles will alternate frequently throughout the session. This week, we are working on a multimedia project called "All about Me." Today, we are putting images into our project using KidPix. Tomorrow we will add audio tracks of our favorite songs that we sing. Our culminating project will be a digital presentation (similar to PowerPoint) in which students will burn a CD to present to their parents and classmates.

I am currently a doctoral student and graduate teaching assistant, surrounded by technology. My course materials and information are managed using a web-based graphical user

interface (GUI). A message board allows for asynchronous discussions, permitting my undergraduate students to converse and share their thoughts in a digital environment and at a time that it is most convenient for them. E-portfolio assignments encourage my students to represent their work and learning within a multimedia format. Hypertext documents accompany student research presentations. Quicktime videos, downloaded from the Internet, permit my students to view pedagogical practices and instructional techniques of other professional educators.

As a digital native (Prensky, 2001), I have grown up with technology, attending innovative schools rich in technology, and working in positive educational settings; yet I have had uneven experiences with technology and its implementation. The technology in my elementary school was treated as an extra, a frill, not an instructional tool. Comparatively, as a cosponsor for WJLB, and a director/teacher for a preschool summer enrichment class, I was astounded at what the students could do, would do, and wanted to do with technology. As a result of my coursework and readings, I have been driven to reflect upon my history with how technology has been used within educational settings. I notice differences, not only in what technology was available, but how the technology was being utilized and how students interacted with it, including what skills they employed to successfully navigate and manipulate the technology. The discrepancy between accessibility and usage caused me to pause and consider this fact. My background, combined with the unsettling perception of the inconsistency in what technology was used and how it was used within educational settings, sparked the curiosity and drive that led me to embark upon this research to investigate how a rural high school (9<sup>th</sup>-12<sup>th</sup> grade) within America's heartland has implemented their one-to-one laptop initiative program.

To reach today's digital native, educators need to expand their thinking and explore the possibilities of technology integration within classrooms.

## **Overview of the Issues**

Through my experiences, I have observed the discrepancy between student access to technology and how that accessible infrastructure is utilized. The National Center for Education Statistics (2006) reported that nearly 100 % of public schools had access to the Internet by 2005. The report continues, revealing that 97 % of high school students (grades 9-12) use computers, and 79 % use the Internet. However, the report maintains that inequality exists between how students are using the computers and the Internet. In order to support the learning and development of all students, educators must encourage students to “engage with a technology-driven, diverse, and quickly changing ‘flat world’ . Teachers need to prepare students for this world with problem solving, collaboration, and analysis – central to community success,” (NCTE, 2007, p. 1). Yet there is a deficit of research data regarding the quality of the experiences students have while using computers and technology (NCES, 2006).

Gee (2003) notes that the technology today's students are engaging in require new ways of thinking and learning. “Learning is or should be both frustrating and life enhancing” (p. 6). As technology advances and becomes more prevalent within our lives, education, too, needs to maintain steady usage and integration of technology in the classroom to keep pace with society and students themselves. To become effective consumers of technology, content area competencies, skills of the new literacies, and critical literacies are requisite. As educators, we need to incorporate the new literacies into classroom instruction, finding ways to enhance and facilitate new learning. The new literacies encompass the literacy skills, strategies, and dispositions necessary to effectively utilize the Internet and other Information and

Communication Technologies (ICTs), to ultimately function successfully within our global community (Leu, Kinzer, Coiro, & Cammack, 2000). Embarking on the 21<sup>st</sup> century, students need literary, critical, content-based, and technological skills to successfully thrive within society. Unfortunately, too many educators do not view these skills as complementary and suitable for integration, but perceive them as separate entities (Draper, Smith, Hall, and Siebert, 2005). The International Reading Association (2002) released a position statement expressing its support of literacy curriculum that integrated new literacies into instruction, instruction that develops the critical literacies which are essential for effective information use, and equal access opportunities to these new literacies. The proposed research study addresses foundational issues impacting content area instruction. In order to effectively prepare students for their futures, additional research is needed to determine how to optimally impact education through content area literacy, the new literacies, and critical literacy in order to marginalize the still existent digital divide.

### *The Digital Divide*

The digital divide is an issue of access to and quality of technology. A dichotomy exists between the “haves,” those who have access to and quality use of technology, and the “have nots,” those without or with drastically less accessibility. Although nearly 100% of United States public schools have been connected to the Internet, situations still exist that allow for some students and schools to be considered as “have nots” (NCES, 2006). Within these areas, student-to-computer ratios tend to be low, and the type of connectivity that is available (broadband versus dial-up access) can vary drastically across different socio-economic levels (Monroe, 2004). Oppenheimer (2004) shares the story of meeting a teacher from inner-city New York, whose new 16 computer lab was waiting for a stable Internet connection. The teacher was

told the lab would be connected in September, but instead the installation date was pushed to November, then December, and the end of the academic year came and went with still no access. It was over a year between the time she obtained new computers and when they eventually were connected to the Internet. This illustrates one of the issues faced among those classified as the “have nots.”

The National Telecommunications and Information Administration (NTIA, 1995) reported that socioeconomic class was the common denominator for locations within which access is not available. Poor rural areas and urban/central cities, like the one in Oppenheimer’s (2004) story, are typically areas that “have not;” there is a lack of infrastructure and/or limited finances for the telecommunications services necessary to grant access to technology. However, access to the technology is only the first step. Andy Carvin, director of the Digital Divide Network (DDN), warned:

...as mainstream America moves online in larger numbers, the problem actually becomes worse for those who are not connected. More and more information is shared through the Internet, and people begin to think there’s not a problem. While access, by itself, is not enough, it is a first step. We cannot allow the privileged majority to be the only ones who have access to essential information. We need to extend this right to everybody (Salpeter, 2006, p. 23).

The International Reading Association (2002) states that equity is needed and that, “it is essential that literacy educators and others support equal access to information technologies for all students to ensure that each student has equal access to life’s opportunities” (p. 2).

Henry (2007) reports that rather than closing the digital divide, it is becoming tertiary in nature, characterized by who has *access*, how that access is *used*, and what *skill base* is

encouraged and employed when students read on the Internet. Valadez and Duran (2007) support the notion that the more traditional binary definition of the digital divide is no longer sufficient. This envisioned digital divide stresses the integration of technology within instruction, emphasizing what students are being encouraged to do with the technology, and how it's being used pedagogically. Integration based on low-level technology use, learning *with* technology, occurs during more teacher-centered instruction, such as reading to locate information; whereas higher-level technology integration, learning *from* technology, is typified by constructivist instructional practices, including reading to critically evaluate information (Bruce, 1999; Ertmer, 2005; Henry, 2007; Labbo & Reinking, 1999). With the flattening world (Friedman, 2005), our global marketplace is requiring and valuing different skill sets. Students still need basic computer skills; however, these skills in the workforce will continue to decrease in value (Apple, 2003; McAdoo, 2003). To level the playing field for students and truly close the digital divide, students need to have skills that allow them to think carefully, creatively, and critically, and to have the interactive aptitude for future success (McAdoo, 2003).

The metaphor of old wine in new bottles needs to be replaced with new wine for those new bottles (Lankshear & Knoble, 2003). Computer activities that support traditional pedagogical practices are old wines; the technology is just another tool used to deliver the same instruction. Although often more comfortable for teachers, keeping what is familiar does not necessarily serve the needs of students. Cuban (1986, 2002) found that teachers often take from technology what they find immediately useful and leave the rest because it “fits” easily within their current instructional practices. Pedagogical practices that serve as new wine touts exploratory, nonlinear, constructivist approaches, challenging students to problem solve, communicate, and think in critically creative way. This re-conceptualization of the digital divide

is a reminder that access alone does not mean that students are having similar experiences; how computers and technology are integrated is just as significant as student access to the technology (Beach & Bruce, 2005; McAdoo, 2003; Valadez & Duran, 2007).

### ***Content Area Literacy Instruction***

Vacca and Vacca (2002) define content area literacy as “the ability to use reading and writing to learn subject matter in a given discipline” (p. 15). In an interview, Donna Ogle shares how fostering content area literacy instruction, or reading across the curriculum, is difficult at the secondary level because of the organizational structure (D’Arcangelo, 2002). The departmentalization of secondary schools presents challenges when attempting to have faculty collaborate on cross-curricular endeavors. No Child Left Behind (NCLB, 2002) legislation has assisted schools and staff by drawing attention to the importance of literacy across the curriculum and throughout the educational system. Teachers are being encouraged to foster student literacy and literacy skills within their respective content area classrooms.

To be literate in content area classrooms, students must learn how to use reading and writing to explore and construct meaning with texts, other learners, and teachers. . . .

Reading and writing are tools that they use to think and learn with text in a given subject area. . . . Students need to know how to think with text in order to respond to, discover, organize, retrieve, and elaborate on information and ideas they encounter in content learning situations (Vacca & Vacca, 2002, p. 17).

Literacy activities are most meaningful and comprehensible when they are contextualized or have a purpose (Gutherie, 2001). Therefore, a natural connection can be drawn between supporting student’s literacy skills, within a literacy framework, and their development of



content area knowledge. “Content area literacy instruction is a legitimate and unavoidable part of meaningful content-area instruction” (Draper, Smith, Hall, & Siebert, 2005, p. 14).

All students currently passing through content area classrooms are digital natives (Prensky, 2001), since at birth these learners entered a digital world. Walking through a shopping mall, one can observe these digital natives listening to their iPods and text messaging their friends or family on their cell phones. Technology is seen as “elements of their environment,” not “mere tools for their learning” (Pitler, Flynn, & Gaddy, 2004, p. 1). Therefore, schooling centered on foundational literacies provide a very limited picture of the possibilities that can be employed by students to create, negotiate, or demonstrate knowledge and learning. New literacies (Leu, 2002a) and multiliteracies (New London Group, 1996) provide new ways to construct and communicate meaning across content areas.

Technology integration in any content area is most effective when the instructor, an expert in his or her discipline, makes important connections between the objectives and pedagogy of his or her content area and the available technology tools. This process involves asking how technology can support and expand effective teaching and learning within the discipline, while simultaneously adjusting to the changes in content and pedagogy that technology by its very nature brings about (Swenson, Young, McGrail, Rozema, & Whitin, 2006, p. 357).

### ***The New Literacies***

The new literacies are those that have emerged within a “post-topographic era” (Reinking, 1998). The literacies that are needed to utilize the Internet and other ICTs comprise the new literacies. A finite and precise definition is impractical since they are constantly emerging, morphing, and changing. The International Reading Association (2002) affirms that

changes in literacy are unmatched in that “they are defined by regular and continuous change,” “they are taking place with breakneck speed,” and “the Internet includes the most powerful capabilities for information and communication we have ever seen, permitting access to people and information in ways and speeds never before possible” (p. 1). No longer are the foundational literacies of paper and pencil technologies sufficient. New technologies that are emerging require new literacies in order to effectively exploit their full potential (Coiro, 2003; Leu 2000; Smolin & Lawless, 2003). Within this realm of new literacies there are skills, strategies, and dispositions that are necessary in order to optimally use and adapt to their deictic nature and ultimately function successfully within this emerging world (Leu, Kinzer, Coiro, & Cammack, 2000). Foundational literacies are a necessary piece in new literacies, but the new literacies advance to include new reading, writing, viewing, and communication skills; they are more complex and multidimensional, thus requiring additional skills (Coiro & Dobler, 2007; Leu & Coiro, 2004).

“One who is literate knows how to gather, analyze, and use information resources to solve problems and make decisions, as well as how to learn both independently and cooperatively” (Kasper, 2000, p. 105). To become fully literate within today’s society, one must become proficient in foundational literacies as well as the new literacies. Proficiency with new literacies requires instruction that encourages students to identify important questions, locate information, critically evaluate the usefulness of this information, synthesize the information to answer the questions, and finally communicate these answers to others (Leu, Kinzer, Coiro, & Cammack, 2000). To accomplish this, effective instruction will need to “take an integrated approach” (NCTE, 2007, p. 5) when addressing literacy skills needed for the 21<sup>st</sup> century.

In a content area classroom, the teacher might encourage students to use the Internet to research a particular topic. Students must have the skills necessary to locate the topic, determine whether or not the information on the topic is valid, biased, and accurate, then sift through websites to find the most pertinent knowledge regarding that topic, and share their findings with others. While requiring more of student competency in functional, academic, critical, and electronic skills, the Internet offers an information-rich environment to identify recent, relevant, and diverse sources of information from which to choose. “Learning how to learn continuously new literacies becomes just as important as becoming proficient in a current definition of literacy (Leu, 2002a); learning to learn is at the core of the new literacies” (Leu, 2002b, p. 466).

Leu (2002a) revealed that the new literacies of the Internet and other ICTs tended to “generate greater interest and motivation” (p. 321) in students and teachers alike. Increased motivation due to new literacies can enhance the quality of student work and achievement (Kratcoski, Swan, & Van’t Hooft, 2005). Reinking (2001) believes this enhanced quality of student work could be since literacy within these environments requires a more active stance when reading. Kist (2003) discovered that in classrooms that were truly integrating and incorporating new literacies into their instruction, students were expected to be “active, engaged, doers. In these classrooms, student achievement equals student engagement” (p. 11).

The infusion of technology in our world, our lives, and our educational system is undeniable and unavoidable. However, the impact technology and the new literacies have upon teacher instruction and student learning remains uneven. At the present time the new literacies are not formally assessed. Until the new literacies are included on state and national exams, new literacies will not be a focus in instruction (Ezarik, 2003). If new literacies are not emphasized within instruction, students will face a deficient skill set for their future success (Leu, 2002a).

“A print-centric focus for student achievement in our schools may be holding some of our adolescent readers and writers back from achieving to their utmost capabilities and developing meaningful literacy lives that will last them well into this century” (Kist, 2003, p. 13).

### *Critical Literacy*

Critical literacy focuses on “understanding the ways in which language and literacy are used to accomplish social ends. Becoming critically literate means developing a sense that literacy is for taking social action, an awareness for how people use literacy for their own ends, and a sense of agency with respect to one’s own literacy” (Dozier, Johnston, & Rogers, 2006, p. 18). New literacies necessitate the need for critical literacies. ICTs allow not only for access to more information, but also permit more people to publish materials for others to access. Therefore, it is essential for critical literacy skills to be advanced in order for students to be able to critically think about and analyze all the information they encounter. This information-rich environment of the Internet and other ICTs can create tremendous opportunities as well as significant challenges for educators. “Since success with technology depends largely upon critical thinking and reflection, even teachers with relatively little technological skill can provide useful instruction” (NCTE, 2007, p. 3). While overflowing with practical information the Internet also is laden with social, commercial, and political messages and undertones (Kalantzis & Cope, 2000). When searching and encountering text and information on the Internet, students must be taught how to critically evaluate the information they find, the message that is being sent, and the intentions of the author.

Street (2003) suggests that, “In practice literacy varies from one context to another and from one culture to another and so, therefore, do the effects of the different literacies in different conditions” (p. 77). At any one time, texts, digital or print-based, portray dominant perspectives

while marginalizing or omitting other perspectives. As teachers, we often “teach, research, and otherwise practice what we know and feel. In short, we teach...who we are” (Cole & Knowles, 2000, p. 188). When teachers are white and middle-class and their students are not, attention needs to be focused on validating, legitimizing, and presenting knowledge from multiple perspectives. Critical literacy empowers students to realize the legitimacy of their own knowledge and recognize how they can use their literacy skills to critically impact and influence their social environment. Educators must encourage students to become more critical consumers of the information in which they encounter (Alvermann, Moon, & Hagood, 1999). Development of critical literacy skills requires students to have agency in order to question and challenge the norm leading to social transformation. These skills will become more important and valuable as information references continue to expand and grow.

When students believe in themselves and trust that they are capable of affecting change, they have agency (Johnston, 2004). Agentive students read purposefully and actively, questioning the author and the text, viewing what is read from multiple perspectives. Critical literacy discourages the unconstrained and non-reflective transfer of information; rather it encourages discussions about readings, problems, and issues that arise out of literacy activities, a critical consciousness. “By developing critical consciousness, students learn to take control of their lives and their own learning to become active agents, asking and answering questions that matter to them and to the world around them” (Elmborg, 2006, p. 193).

Critical literacy within instruction tends to unfold in classrooms that promote constructivist pedagogy, encourage inquiry, foster connections between the content and texts to the lives of students, and are sensitive to discussions maintaining a low affective filter (Dozier, Johnston, & Rogers, 2006). Within these classrooms both students and teachers must learn to

“feel comfortable with discomfort: understanding that important learning often begins by confronting issues we have learned to avoid” (Dozier, Johnston, & Rogers, 2006, p. 43). Fostering critical literacy within students require educators to re-conceptualize their classrooms and their purpose. New literacies encourage learning to learn (Leu, 2002b); in order to successfully thrive in these emerging environments, critical literacies must encourage the same stance. As educators within the 21<sup>st</sup> century we are not, and do not have to be the all-knowing experts within the classroom, but we are the facilitators of learning within our classrooms, helping students “access, evaluate, synthesize, and contribute to information” within our society (NCTE, 2007, p. 5).

### **Rationale for the Study**

Literacy is evolving to include the new literacies. New literacies include the Internet and other ICTs that encourage the adoption of skills and strategies for the successful utilization of these new literacies. Constantly changing, as new technologies emerge and grow, so must new literacies to promote their effective application and implementation across content areas. The challenge for researchers and educators becomes not necessarily that the new literacies are changing, but how *quickly* they are changing, growing, and evolving. During the 1980's, the notion of introducing computers into schools was revolutionary and cutting edge. The literacy lives that students will know upon entering school will likely undergo profound changes by the time they graduate from school, participating in unimaginable new literacies that have not yet been created (IRA, 2002). It is vital that researchers continue to probe what is characteristic of practice in schools, and what lies ahead in relation to literacy instruction and learning.

A growing number of educators are using technologies to grant access to online texts and other multimedia resources to help students build new literacy skills (Hobbs, 2006).

However, there are still many classrooms in which technology integration is viewed just as an extra, an add-on, or a reward for finishing their “real work” (Turnbill & Murray, 2006). When talking with some teachers who resist integrating technology within their instruction, Leu (2002b) found that teachers often provided the excuse of a lack of time or professional opportunities within their already hectic instructional schedule, or lack of time to learn new instructional strategies in order to integrate them within their instruction. The difference is that this generation of digital natives (Prensky, 2001) has been born into a technological age; digital immigrants (Prensky, 2001), those not born into this digital age, may view technology as a frill, while their students perceive it as a necessity. We must prepare our students for their future, not our past (Thornburg, 1999).

“Far too many secondary school students do not graduate or graduate without the skills necessary to become successful citizens in a global community . . . The ability to read and write is an access skill to all other content areas” (Fisher & Ivey, 2005, p. 3). Making the assumption that high school students can read proficiently enough to comprehend content area textbooks is naive. The disagreeable nature of content area textbooks often make it so students struggle to comprehend concepts and understand terminology. Each content area with its unique discipline constructs unique texts, making mathematic texts very different from Spanish texts.

Additionally, within a textbook, there is often inconsistent organization between chapters, insufficient definitions of essential vocabulary, and densely worded paragraphs that include an overwhelming number of concepts, and details with minimal explanation (Mastropieri, Scruggs & Graetz, 2003). Therefore, because content area teachers are experts within their fields, “they are the best equipped to show students how to read the texts unique to their subject” (Fordham, 2006, p. 390). Furthermore, the textbooks within classrooms are often outdated. By the time a

book has been researched and written, much of its content is immediately outdated. Students realize that the Internet can provide legitimate and current information. With the Internet and ICTs, one can check to see how recent the information is; often times the source has been updated within the past few months.

These issues of new literacies and legitimate literacies tend to intensify within the perspectives of content area educators. Content area teachers sometimes do not make the connection between teaching 21<sup>st</sup> century literacy skills and foundational literacy skills, nor do they utilize literacy to advance comprehension of their content instruction (O'Brien, Stewart, & Moje, 1995; Fisher & Ivey, 2005). Sweeny (2007) highlights that through the use of the new literacies, the connection can be made between reading and content area instruction. Using the Internet and other ICTs, content area teachers can draw upon information sources related to their content area, enhancing student learning. New literacies can elicit multiple modes of texts within the content area, motivating students, and providing them with choice. Both teachers and students have choices in texts, modes of texts, and thus options to engage students in learning and teachers in their ability to differentiate instruction (Sweeny, 2007). "Adolescent learners ... will continue to respond to emerging technologies, challenging teachers across all content areas to push against traditional ideas of reading/writing/communicating meaning while also providing students with authentic, meaningful opportunities to engage actively in meaningful work that extends and elaborates on academic literacy" (Kajder, 2007, p. 97).

This study investigates and explores a rural high school's integration of a school wide one-to-one laptop initiative. Through internal funding, the school district purchased iBook laptops for all the students and staff at the high school, thus initiating a one-to-one laptop program. Through further exploration of this school's innovative use of technology in content



area classrooms, perhaps more can be learned how students are developing 21<sup>st</sup> century literacy skills, and how teachers are integrating technology within their content area classrooms.

### **Purpose of the Study**

Studies have been conducted investigating the impact one-to-one laptop initiatives have had on instruction and student learning (Bebell, 2003; Development Associates, 2005; Silvernail & Lane, 2004; Warschauer & Grimes, 2005). This study, however, takes a more in-depth look at how this rural high school's one-to-one laptop technology initiative has impacted teacher's daily instruction, specifically the perceived impact of new literacies through content area literacy, and as a result, how teacher's instruction has affected student's overall learning and comprehension. Therefore, the purpose of this case study is to explore how the one-to-one laptop initiative has been infused into content area classrooms, thus exploring how content area literacy is being taught, how the new literacies are being utilized, and how critical literacy is being fostered within participating content area classes.

Methodologically, this study is qualitative in nature to achieve a holistic yet deeply embedded understanding of the impact this laptop initiative has had on teacher instruction, instruction to enhance student learning, parental attitudes, and administration decisions. Taking a case study approach in framing the study, Stake (1995) states that, "the function of research is not to necessarily map and conquer the world, but to sophisticate the beholding of it" (p. 43). This study comprehensively examines the one-to-one laptop initiative from multiple perspectives - teachers, students, administrators, and parents - in order to intensely examine the multiple forces interacting with teachers' instruction and how that instruction affects students' learning.

Data were collected through multiple sources and multiple perspectives. All participants - teachers, students, administrators, and parents - were given open-ended qualitative surveys to

elicit initial data utilized to direct questions in further individual interviews and focus group interviews. School wide and classroom based observations provided a substantial portion of the data collected. Documents and artifacts supported, confirmed, or challenged data collected from other sources. Data were analyzed through direct interpretation and categorical aggregation (Stake, 1995) to draw together the data and analyze them and synthesize them thus creating a more meaningful perspective.

It is with this plan, method, and purpose that I embarked upon this study. The study seeks to explore and describe participants' experiences and perspectives regarding the perceived impact the rural high school one-to-one laptop initiative has had on content area literacy, the new literacies, and critical literacy.

## **Research Questions**

Guiding the research and data collection of this study, I posed the overarching question: What is the *perceived impact* that the one-to-one laptop initiative has had on *teacher's instruction to enhance student learning*? To create a framework for this exploration, I intend to answer the following related questions:

1. How is the one-to-one laptop initiative's technology being utilized by participants?
2. How has content area literacy instruction been effected as a result of the one-to-one laptop initiative?
3. What has been the role of the new literacies as a result of the implementation of the one-to-one laptop initiative?
4. What has been the role of critical literacy within content area classrooms with the one-to-one laptop initiative?

## **Significance of the Study**

Similar research studies have been conducted to determine the impact one-to-one laptop initiatives have had in schools (Bebell, 2003; Development Associates, 2005; Silvernail & Lane, 2004; Warschauer & Grimes, 2005). The foci of these studies have been on a wide scale, typically evaluating their effectiveness and success, in order to recommend their continuation or termination. This study proposes to research in depth the impact a one-to-one laptop initiative has made upon a rural, Midwestern high school; researching in detail how teacher's content area instruction and instruction to enhance students' learning are being effected as a result of this one-to-one technology initiative. More specifically, the proposed research will highlight how new literacies are influencing and impacting content area literacy and critical literacy, to better prepare students for the demands of the 21<sup>st</sup> century and our global community. "The Partnership for 21<sup>st</sup>-Century Skills (<http://www.21stcenturyskills.org>) advocates for core academic subjects, learning and innovation skills, and life and career skills along with technology skills" (NCTE, 2007, p. 2). Through the integration of these skills and knowledge-bases, students will be better equipped to move forward and take advantage of opportunities that arise. When one area is lacking the equipment, facilities, or support to provide the necessary skill, educators and schools can struggle. However, when the resources are present, the opportunities for instruction and learning are limitless.

The study will build upon prior research in order to address some of the issues that have been described as limiting. For example, in an evaluative report on the Maine Technology Learning Initiative (MTLI), the researcher mentions that even though the impact on student learning is perceived as successful, additional research needs to be conducted to validate these findings (Silvernail & Lane, 2004). This Maine study claimed that there was limited "concrete

evidence” (p. 28) to create the validity necessary to begin generalizing findings. This study focuses on exploring the specific nuances of content area teaching and learning within the one-to-one laptop initiative program at this rural high school of 82 students. Due to the small size of the school, regular and extended observations allow for a detailed account of teaching instruction and the perceived impact on instruction to enhance student learning. Documentation provided by the district provides further crystallization (Richardson, 2000) of data analysis findings. Additionally, individual perspectives are heard through a combination of individual and focus group interviews, which supported data obtained through other sources.

During data collection, teacher participants within the proposed study engaged in interviews, reflecting upon their pedagogical practices and explaining their instructional decisions, thus encouraging their growth as professionals. Students also participated in this research and were encouraged to reflect upon their learning and the commitment to their education. Upon completion of the research, preliminary findings were shared with the high school and school district administration, thus providing them possible insights not previously attained.

Literacy and literacy instruction are evolving and constantly changing. Educators must recognize this reality and respond to the changing new literacies to effectively respond to the instructional needs of learners (Hobbs, 2006). This research explores how new literacies are impacting the content area literacy of students when the technology has been made readily available by the one-to-one laptop design. As a result of these new findings and aligned with findings from prior studies, educators and administrators alike may make more informed decisions regarding instructional choices and programmatic implementations of one-to-one laptop uses in educational settings.

## **Limitations of the Study**

The researcher biases toward technology create a limitation to the study. As with any qualitative research, the researcher views and perceives situations, comments, and experiences through a unique lens. Thus experiences and preconceptions brought into the study will influence the viewpoint and angle from which data are collected. During observations a concerted effort will be made to record events objectively and open-mindedly to minimize this limitation.

Another limitation is the rural nature of the school and district. The high school is set in a very rural area, drawing its enrollment from a 319 square mile radius. Covering so much area, students from different small towns attend the same high school. Therefore, even though this is the same school, perspectives of students could vary widely because of norms, dispositions, and values brought by the community in which they live. Caution will be taken and effort focused to collect data from as many students within the school as possible, to gain a thorough and complete perspective of teaching and learning in the school as a whole within the auspices of the one-to-one laptop technology initiative.

A major limitation to this study is its size. Only one school will be included in the research since it is the only school within the district that has implemented such a laptop program. The high school itself is very small, with 69 students enrolled and only one content teacher per subject area. Therefore, comparisons cannot be made between different classrooms within the same content area. Yet due to its size, more in depth data can be collected revealing a higher fidelity for the study.

## **Organization of the Dissertation**

The dissertation for this study is divided into five main chapters. The overview, Chapter 1, provides a brief explanation and introduction into the framework and the direction for the study. Appendix A lists and defines terminology that is key to the study. Chapter 2 provides the review of literature and research. Within this chapter the theoretical underpinnings of the study will be discussed followed by a broad review of related literature including four main studies that have impacted and influenced this study. In Chapter 3, the methodology of the study is explained. A rationale for decisions and choices that have been made regarding the data collection and data analysis methods are provided to guide the reader through the qualitative research processes of the researcher. Chapter 4 presents the data findings that were collected and analyzed from the case study. Findings align to the theoretical foundations presented in Chapter 2. Finally, Chapter 5 discusses the overall findings, conclusions, implications and recommendations for research and practice based upon the presented data findings. These implications and recommendations support and extend the current research base and practical applications based on the findings from this case study research.

## **CHAPTER 2 - Review of the Literature**

This chapter reviews the theoretical foundation and research-based literature that surrounds, supports, and provides the bases for this study. Divided into four main sections, this chapter (a) grounds the proposed research in theoretical foundations, (b) attends to issues concerning content area literacy, (c) explores technology's impact on literacy instruction and learning, and (d) reviews recent research specifically related to laptop computer technology initiatives within schools. The purpose of this study was to explore how the one-to-one laptop initiative has been infused into content area classrooms, thus exploring how content area literacy is being taught, how the new literacies are being utilized, and how critical literacy is being fostered within participating content area classes.

Literacy has been an integral and transactional part of society for centuries. Consistently as society has changed and developed, literacy also has evolved in order to meet the needs and functions imparted by societal forces and contexts (Gee, 1996). For instance, literacy skills were required to record business transactions within societies that no longer functioned within subsistence economics (Boyarin, 1993), literacy was utilized by societal oppressors, and as resisters of oppression strove to communicate literacy morphed again (Teras, 1994). Revolutionaries within Czarist Russia created a secretive system of reading and writing, samizdat, in order to communicate and publish propaganda without being caught by officials. As the world and people's lives change, so does literacy and the technologies that support effective literate acts during that time.

The theoretical underpinnings of this study include the emerging theory of new literacies, social constructivism, and the multifaceted critical literacies. Relevant research and literature

closely related to the basis of this study is reviewed to provide further insight and perspective into the study.

## **Theoretical Foundations**

The theoretical foundations forming the backbone of this study include (a) the emerging theory of new literacies, (b) the theory of social constructivism, (c) and the theory of critical literacies. The new literacies are critical, socially constructed, and require access to the Internet and other ICTs to fully access their potential among other principles.

Social constructivism touts that knowledge is created through shared collaborative experiences. The Internet and other ICTs require social constructivism through cooperation and collaboration as individuals work to optimally utilize this continually changing and complex new literacy environment. Sole responsibility for navigating, using, and transmitting knowledge about the technologies of new literacies does not have to burden teachers alone; rather, each individual within the classroom will hold a unique knowledge that is useful to others. “It is simply impossible for one person to know all the new literacies and teach these directly to others” (Leu, Kinzer, Coiro, & Cammack, 2000, p. 121).

Critical literacies challenge individuals to question the legitimized norms of literacy, looking at situations through multiple lenses, and recognizing the agency within their own personal literate practices to bring social transformation (Dozier, Johnston, & Rogers, 2006). Open networks, like the Internet, allow anyone to publish and dispense practically anything. Therefore, when accessing information within these environments, individuals must critically examine and evaluate the legitimacy of the information (Leu, Kinzer, Coiro, & Cammack, 2000).



The following sections review and examine the theoretical foundation that ground this qualitative research study. The emerging theory of new literacies will reveal the foundation of the study, supported by the theories of social constructivism and critical literacy.

### ***Toward a Theory of New Literacies***

Literacy has moved beyond paper and pencil technologies to include other forms of literacy such as visual, informational, and media literacies. Literacies have become multiple in nature and are continually emerging.

While it is clear that many new literacies are emerging rapidly, we believe the most essential ones for schools to consider cluster around the Internet and allow students to exploit the extensive ICTs (information and communication technologies) that become available in an online, networked environment. In an information age, we believe it becomes essential to prepare students for these new literacies because they are central to the use of information and the acquisition of knowledge. Traditional definitions of literacy and literacy instruction will be insufficient if we seek to provide students with the futures they deserve (Leu, Kinzer, Coiro, Cammack, 2000, p. 109).

Literacy today requires more than decoding text and basic linear comprehension. It requires a critical approach to literacy and reading comprehension (Street, 2003), comprehension that is socially constructed and situated within context (Gee, 2003; New London Group, 1996), and comprehension based on intertextuality (Bakhtin, 1981; Bazerman, 2004; Smolin & Lawless, 2003).

This theoretical perspective of new literacies is one of the most inclusive perspectives because it takes the constantly deictic nature of new literacies into account. However, new literacies themselves have been difficult to define because of this continuous change, thus

creating a challenge when theorizing them. The closest conceptualized definition of new literacies is:

The new literacies of the Internet and other ICTs include the skills, strategies, and dispositions necessary to successfully use and adapt to the rapidly changing information and communication technologies and contexts that continuously emerge in our world and influence all areas of our personal and professional lives. These new literacies allow us to use the Internet and other ICTs to identify important questions, locate information, critically evaluate the usefulness of that information, and synthesize information to answer those questions, and then communicate the answers to others (Leu, Kinzer, Coiro, Cammack, 2000, p. 110).

To more precisely define new literacies would be likely impossible since additional new literacies are constantly being developed. This emerging theory is grounded within the sound theoretical foundations of a critical literacies perspective, a transactional stance, and a socially situated constructivist framework (Leu, Kinzer, Coiro, & Cammack, 2000). These viewpoints support and guide the following ten key principles to the emerging new literacies theory.

### ***Key Principles of the Emerging New Literacies Theory***

As a result of these emerging and ever present new literacies, a theory is being formulated by Leu, Kinzer, Coiro, and Cammack (2000) that identifies ten key principles on which the new literacies perspective should be based:

- The Internet and other ICTs are central technologies for literacy within a global community in an information age.
- The Internet and other ICTs require new literacies to fully access their potential.
- New literacies are deictic.

- The relationship between literacy and technology is transactional.
- New literacies are multiple in nature.
- Critical literacies are central to the new literacies.
- New forms of strategic knowledge are central to the new literacies.
- Speed counts in important ways within the new literacies.
- Learning often is socially constructed within new literacies.
- Teachers become more important, though their role changes, within new literacy classrooms (p. 117).

The following sections elaborate and provide researched-based studies to assist in defining and explaining each theoretical principle.

***The Internet and other ICTs are central technologies for literacy within a global community.*** Print text has traditionally shaped the concept of literacy. Now, with the rapidly changing nature of the Internet and other ICTs, one must recognize how these technologies are central to literacy in the global community within this information age. “We can no longer afford to think that a literacy program should only prepare students for reading traditional texts or writing with paper and pencil technologies. The Internet and other ICTs demand new literacies for their effective use” (Leu & Coiro, 2004, p. 6). Traditional reading skills are important when comprehending new literacies, but they are not solely sufficient in order to successfully read and comprehend information on the Internet, comprehension is considerably different (Coiro, 2003; Coiro & Dobler, 2007).

Internet Projects (Leu, 2001) are used by teachers to not only encourage necessary technology skills within their students, and allow them to utilize new literacies, but also to provide opportunities for students to connect and engage with other students in different

locations enabling them to solve problems and investigate common topics. Internet Projects are geared toward advancing student learning and success in the ever growing global information age. Students must gather and critically evaluate relevant information in order to use it to solve the project that is being worked on, and to then communicate the proposed solution clearly and efficiently. Internet Projects “create new definitions of authentic reading and writing experiences,” with students “communicating daily with others in our global village, . . . making new friends and sharing new insights about the world around them. At the same time they develop the new literacies of Internet technologies” (Leu, 2001, p. 584).

***The Internet and other ICTs require new literacies to fully access their potential.*** New literacies demand skills and strategies, in addition to those typified by foundational literacies, in order to effectively use the Internet and other ICTs. There are five dispositions that encourage fully accessing the potential of the Internet and ICTs: (a) identifying important questions, (b) locating information, (c) critically evaluating the usefulness of that information, (d) synthesizing information to answer those questions, and (e) communicating the answers to others (Leu, Kinzer, Coiro, & Cammack, 2000). Internet text contains added obscurities thus complicating the process of reading comprehension (Coiro, 2003; Coiro & Dobler, 2007).

***New literacies are deictic.*** “Literacy is rapidly and continuously changing as new technologies for information and communication repeatedly appear and new envisionments for exploiting these technologies are continuously crafted by users” (Leu, 2000, p. 1). This deictic nature of new literacies is a foundational and a defining quality to this emerging theory. It will continue to be so in the future, accelerating as new literacies come into view and new skills and strategies are requisite in order to be used effectively. The 3 sources of deictic literacy include: (a) transformations of literacy because of technological change, (b) envisionments of new

literacy potentials within new literacies, and (c) the use of increasingly efficient technologies of communication that rapidly spread new literacies (Leu, Kinzer, Coiro, & Cammack, 2000). New literacies will not be limited by technology, but will be limited by people's ability to adapt to the new literacies that emerge. Learning how to learn becomes just as important, if not more so, than merely learning how to use particular technologies (Leu, Mallette, Karchmer, & Kara-Soteriou, 2005).

***The relationship between literacy and technology is transactional.*** As technologies are being used to foster literacy, new literacies are being created, and as literacies are evolving their forms and functions, they are transforming the use of technologies. The new literacies are thus multimodal with popular culture often impacting literate behaviors at home and school (Dyson, 1999). Literacy becomes multidimensional and interactive while taking on multiple forms and functions. Being able to express knowledge in a multimodal way in which there is a transaction between the technology and the literacy allows individuals to articulate themselves in a much richer and complex way than through just standard written reports (Kist, 2005).

The transaction between literacy and technology maintains the intertextuality of new literacies. With intertextuality, "texts do not appear in isolation, but in relation to other texts" (Bazerman, 2004, p. 53). The plethora of new literacies require individuals to be conversant with the transaction and intertextuality of the textual modes that can be read from photographs, video, interview data, to print text, email, and hypertext.

***New literacies are multiple in nature.*** "A new literacies perspective recognizes that a singular label, literacy, fails to capture the complexity of the changes that can only be captured by a plural label" (Leu, Kinzer, Coiro, & Cammack, 2000, p. 119). A set of open-ended and flexible multiple literacies required to function in diverse contexts and communities define the

concept of multiliteracies (New London Group, 2000). This multiple nature of new literacies or multiplicity exists at three levels: (a) meaning is represented with multiple media forms, (b) multiple tools are offered for constructing multiple forms of communication, and (c) the new skills that are demanded by our students as they encounter information from individuals in different social contexts (Leu, Coiro, Kinzer, & Cammack, 2000).

Tierney & Rogers (2004) illustrate the multiplicity of new literacies through the creation of a multimedia project. Based on a common interest centering on the topic of Imperial China, students read books and pamphlets, used the Internet to search for information, scanned photographs, and interviewed experts. Through this research, students' final projects were the conglomeration of these informational sources resulting in a multimedia project.

When there is textual diversity and multiplicity, one can "ensure the negotiation of multiple perspectives by starting from multiple source texts on a given topic of inquiry" (King & O'Brien, 2005, p. 46). The multiple contexts of new literacies create significant implications for educators when preparing students to critically understand, interpret, and comprehend what is read on the Internet.

***Critical literacies are central to the new literacies.*** Critical thinking when encountering new literacies is essential for the successful acquisition of knowledge and valid understanding. When one reads critically, the meaning of text is being constructed, extended, and examined; the reader, "investigates sources, recognizes an author's purpose, distinguishes opinion from fact, makes inferences, forms judgments and detects propaganda devices" (Coiro, 2003, p. 29). The Internet and other ICTs require increasing critical examination to ensure information found is legitimate and truthful, and that authors of websites are not promoting ulterior motives with the information that has been published.

*New forms of strategic knowledge are central to the new literacies.* Within each technology, there are different contexts and resources for constructing meaning which require different strategies to do so (Mayer, 1997; Semali, 2001). For example, Reinking (1997) said, “Hypertext is a particularly good example of how a technology of reading and writing always affects the way we communicate and disseminate information, how we approach the task of reading and writing, and how we think about helping people to become literate” (p. 628). Of the many forms of strategic knowledge necessary to navigate new literacies like the Internet, the ability to locate, evaluate, and effectively use the extensive resources are among the most important.

*Speed counts in important ways within the new literacies.* The rate which one can acquire, evaluate, and use information to solve problems is key to success in competitive information economies (Leu, Kinzer, Coiro, & Cammack, 2000). Leu (2001) challenges that, “the world of work has changed” (p. 1). Globalization is flattening the hierarchy of organizations and business. To succeed within this environment one must quickly, accurately, and effectively accomplish tasks via new literacies. Students who are slower readers may struggle, quickly skim an Internet webpage, and discriminate between what is pertinent information and what is not, thus likely exacerbating the Matthew Effect (Stanovich, 1986) within student’s literacy skills.

*Learning often is socially constructed within new literacies.* Social learning is essential and includes the exchange of new skills and strategies needed in order to interact within a new literacies platform. Social learning is not only important for how information is learned, but how the information is constructed within the technologies themselves (Leu, Kinzer, Coiro, & Cammack, 2000). Hence, learning and construction of knowledge become collaborative

ventures. These collaborative learning communities facilitate literacy development because, “when learners juxtapose [their differences], they gain substantively in metacognitive and metalinguistic abilities and in their ability to reflect critically on complex systems and their interactions” (New London Group, 1996, p. 69).

*Teachers become more important, though their role changes, within new literacy classrooms.* The fundamental role of the teacher will be to orchestrate complex contexts for literacy, not maintaining an Atlas complex (Lee & VanPatten, 2003) through simply dispensing literacy skills. Effective new literacy classrooms require teachers to shift from the role of expert (teacher-centered) to the role of facilitator (student-centered) (Leu & Kinzer, 2000; Pope & Golub, 2000). The teacher may no longer always be the most literate person within the classroom (Leu, 2000; Leu, Kinzer, Coiro, & Cammack, 2000). As a result, the roles between teacher and student will at times be reversed. Greater attention will need to be placed on teacher education and professional development to effectively prepare teachers in literacy instruction within the world of new literacies (Ertmer, 2005; Karchmer, 2001; Leu, 2002a; Wepner, Tao, & Ziomek, 2006).

The emerging theory of new literacies is pivotal within the current study. The integration of a one-to-one laptop program, in which all students and teachers have access to the Internet during the school day, has implications to how each teacher’s content area instruction and student learning are impacted by the new literacies.

### ***Social Constructivism***

Vygotsky’s (1978) theory of social constructivism implies that a student can learn more when working with a knowledgeable adult or a more capable peer. Collaboration can foster a



deeper understanding of not just content but the process of comprehending the content. “The inter-dependence between peers is unique in how it pushes children to take the perspective of the other and to function at a higher level than in other contexts” (Cassell, 2004, p. 6). The emerging new literacy theory supports this notion of social collaboration. The very nature of new literacies like the Internet and other ICTs promotes communication between individuals. There is communication between the reader’s perspective of content and the perspective the writer intends. This has always been the case, but the accessibility of communication has grown exponentially with new literacies. Paper and pencil technologies used to record business transactions are being replaced in favor of the Internet and ICTs, enabling individuals, groups, and societies to access the best information in the shortest amount of time, evaluate that information and communicate the information to others. “Inevitably, workplace demands in an information economy will require students to become proficient in using these new literacies of the Internet” (Karchmer, 2001, p. 445). Karchmer (2001) further states that there are four skill areas that are important within this global marketplace all of which support the social construction of new literacies: (a) the ability to work in collaborative teams, (b) the ability to work effectively with others, (c) the ability to acquire and sift through information, and (d) the ability to problem-solve.

Piaget (1963) contended that individuals construct their learning through assimilating or accommodating new information with existing knowledge. Dewey (1963) asserted that a school setting is a community, in which students work together in a social environment to construct knowledge in order be able to fully participate within society. Aligning with these culturally sensitive viewpoints, Street (2003) asserts that literacy is social practice, not simply a technical and neutral skill; literacy remains embedded within socially constructed principles. A research

study supported the new literacies constructivist framework, “as students constructed meaning, they often communicated these meanings to others electronically; as students communicated electronically with others, they often constructed new meanings about the information in the program” (Leu, Hillinger, Loseby, Balcom, Dinkin, Eckels, Johnson, Mathews, & Raeler, 1998, p. 217).

Boxie and Maring (2002) conducted a study that integrated literacy skills within a web-based project to further develop the writing practices of students. The students were part of a middle school science classroom and embarked on a web-based project, the Dynamic Earth Project. This project permitted students to work cooperatively and take part in an authentic learning activity. Students chose a specific topic within their cooperative groups, researched it, organized the information they found, and submitted an electronic essay about it to their cyber-buddies. Preservice teachers acted as cyber-buddies, mentors to these middle school students, fostering literacy skill development within the students. The cyber-buddies scaffolded and supported students learning by creating a zone of proximal development (Vygotsky, 1978). Depending on the needs of the students, cyber-buddies would provide relevant encouragement, suggestions, and strategies to foster and advance student’s writing skills. Through ongoing communication via email between students and their cyber-buddies, meaningful, active, and co-constructed literacy learning was achieved.

It is unrealistic to expect that teachers should be experts in all new literacies, especially because of their deictic nature. Therefore, it is logical to encourage students to work with their peers and teachers to collaboratively construct meaning in form and function of the new literacies. “As the reader’s knowledge changes, as the reader interacts with other readers and with the teacher in a social context, constructed meanings can be expected to change” (Ruddell

& Unrau, 1997, p. 110). New literacies, like the Internet and ICTs, permit students to access information resources and construct meaning appropriate for their individual learning needs (Leu, 2000). “Collaborative learning facilitated by networked technology environments tends to make practices of knowledge processing more accessible and widespread that would be present in conventional learning environments,” (Järvelä, 2001, p. 47).

The theoretical foundation of social constructivism supports the basis for the current study. Within the high school’s implementation of a one-to-one laptop initiative program, students and teachers alike will have to acclimate to the available technology. This study strived to explore, through the lens of social constructivism, the perceived impact that the one-to-one laptop initiative has had on the dynamic between teacher instruction and instruction to enhance student learning.

### ***Critical Literacy***

Critical literacy is grounded in the theoretical foundations of critical theory. “Critical theory means to show only the specific social conditions at the root of philosophy’s inability to pose the problem in a more comprehensive way” (Marcuse, 1992, p. 14). Critical theorists like Freire and Macedo (1987) and Giroux (1987) are well versed in critical theory and its implications for and impact on education, pedagogy, and curriculum. Freire (2007) writes that to acquire literacy is more than to psychologically and mechanically dominate reading and writing techniques. . . . It is to *communicate* graphically. . . .Acquiring literacy does not involve memorizing sentences, words, or syllables – lifeless objects unconnected to an existential universe – but rather an attitude of creation and re-creation, a self-transformation producing a stance of intervention in one’s context (p. 43).

It is through the lens of critical theory that the current research seeks to focus on critical literacy.

Critical literacy and critical teaching require awareness of the social, historical, and linguistic factors that influence teaching, learning, and literate practice in order to work toward socially just ends. It requires an awareness of privilege and the ability to imagine different possibilities in perspectives and practices (Dozier, Johnston, & Rogers, 2006, p. 168).

Critical literacy encourages individuals to read attentively and actively, focusing on the message the author intends to send, and maintaining awareness that the language being used is a method for this accomplishment (Dozier, Johnston, & Rogers, 2006). Teachers who encourage critical literacy within their classroom do more than just address instructional goals and literacy skills. Rather, there is an emphasis on consciously attending to relationships, dispositions, and values with respect to social justice. This is particularly important when most teachers are “white and middle-class and the students they teach are not, and when much of what students will read reflects a gendered, classed, racist society” (Dozier, Johnston, & Rogers, 2006). “Some forms of knowledge have more power and legitimacy than others” (McLaren, 2007, p. 197). Teachers must encourage students to act with agency, to actively engage and purposefully explore literacy situations. Therefore, students are able to recognize that there are multiple forms of knowledge, viewpoints, and perspectives, and that their vantage point is of valid consequence.

***Agency and Accelerating Critical Literacy Skills.*** Johnston (2004) utilizes the term *agency* – the idea that by acting thoughtfully, one might affect change. Teachers who promote critical literacy instruction and students who practice critical literacy within their lives can have an impact on other students, teachers, schools, and society as a whole. Becoming critically literate implies that one develops awareness that literacy is for taking social action, recognizes

how people use literacy to address their own agenda, and develops a sense of agency with respect to one's own literate practices.

To encourage agency and accelerate a student's literacy learning, teachers must be consciously aware and respond to the needs of their students. They need to become "sensitive observers" (Clay, 1993), or "kid-watchers" (Goodman, 1978). Teachers recognize what support students need, and when they need it in order to maximize their potential learning. This is a delicate balance between being ready for instruction and being unable to accept instruction because of frustration. Students with agency learn to feel comfortable within the zone of proximal development (Vygotsky, 1978), their self-talk says some version of, "Yes, I imagine I can do this," (Dyson, 1999, p. 396). This attitude of agency allows students to take risks in learning, valuing "error and surprise as productive spaces for learning and self-correction for its contribution to independence and development" (Dozier, Johnston, & Rogers, 2006, p. 15). Situations for learning do not exist if students are not taking risks and making errors.

When viewing agency through a critical literacy lens, one must view texts "not as fixed and complete objects but as places for discussion, argument, and challenge as well as for enjoyment, information, and pleasure" (O'Brien, 2001b, p. 40). Critical literacy asks agentive students to read purposefully and actively, to question the author and the text, to view what is read from multiple perspectives. Critical literacy asks students not to just understand the use of language and literacy for others to accomplish social ends, but to encourage students to "use literacy for their own ends, and a sense of agency with respect to one's own literacy" (Dozier, Johnston, & Rogers, 2006, p. 18).

***Promoting Critical Literacy within the Classroom.*** To promote critical literacy within the classroom teachers must uphold, "critical thinking that enables one to 'read the world'

critically and to understand the reasons and linkages behind the facts” (Macedo, 2006, p. 16).

Critical literacy is asking questions, challenging the status quo, and becoming independent thinkers that are fully literate and are able to express their unique and original opinions to others. It is created within a space where, “students and teachers work together to (a) see how the worlds of texts work to construct their worlds, their cultures, and their identities in powerful, often overtly ideological ways; and (b) use texts as social tools in ways that allow for a reconstruction of these same worlds,” (Luke, 2000, p. 453). Conversely, critical literacy is not mindless and meaningless, doing drills, “in preparation for multiple choice exams and writing gobbledygook in imitation of the psycho-babble that surrounds them,” (Macedo, 2006, p. 16).

Henry (2006) researched critical literacy’s role within a new literacy classroom. Effectively reading and comprehending information on the Internet takes additional skills and strategies beyond those required for success with the foundational literacies (Coiro, 2003; Coiro & Dobler, 2007). Henry (2006) suggests that educators use the acronym SEARCH to assist students in critically reading the Internet. SEARCH represents six stages: (a) set a purpose for reading, (b) employ effective search strategies, (c) analyze search-engine results, (d) read critically and synthesize information, (e) cite sources, and (f) how successful was the search. The fourth stage, reading critically and synthesizing information, is vital within a new literacy, online environment. Through practice evaluating websites, students will begin to recognize what to attend to in order to verify the legitimacy of a website or source; for example, noticing the author and institution the author is associated with, the purpose of the website, the intended audience, and the copyright information. Henry (2006) states that students must be supported when developing these critical literacy skills, “especially when reading on the Internet is extracted not only from multiple sources but from multiple contexts” (p. 621).

In essence, fact-based assignments leading to objective-style assessments do little to help students better understand meaningful issues that either directly or indirectly affect their social lives (Fabos, 2004). “At its best, a theory of critical literacy needs to develop pedagogical practices in which in the battle to make sense of one’s life reaffirms and furthers the need for teachers and students to recover their won voices so they can retell their own histories and in so doing check and criticize the history they are told against the one they have lived” (Giroux, 1987, p. 15).

**Power Dynamic.** The question, “Who do you teach?” is not typically asked; however, the question, “What do you teach?” is frequently asked and more accepted as a norm. Teachers attend college to learn how to teach content, but in reality it is the students who we want to reach, they who should be the focus. The change for some teachers is shifting their instructional paradigm from *delivering* the curriculum *to* students, to *constructing* the curriculum *with* students (Lyons, Pinnell, & DeFord, 1993). The teacher being the most knowledgeable one in the classroom is not necessarily the ideal power dynamic. Classroom relationships are more productive in a critical literacy learning environment when there is a more symmetrical give and take, classroom relationships focused on caring, respect, and trust versus power and control (Dozier, Johnston, & Rogers, 2006). When critically and effectively introducing new literacies, teachers can “empower individuals and groups traditionally excluded and thus reconstruct education to make it more responsive to the challenges of a democratic and multicultural society,” (Kellner, 2000, p. 1). McLaren (2007) argues that empowerment is not only helping students “understand and engage the world around them, but also enabling them to exercise the kind of courage needed to change the social order where necessary” (p. 211).

***Social Transformation.*** “Teaching and learning should be a process of inquiry, of critique; it should also be a process of constructing, of building a social imagination that works within a language of hope” (McLaren, 2007, p. 217). This is best made possible when knowledge is made relevant, critical, and transformative. Knowledge is relevant when students *bring* with them their experiences from their lived culture. McLaren (2007) states that knowledge is critical, only when these lived experiences that are brought become problematic to some extent (gendered, classed, or racist). Knowledge becomes transformative, linked to social reform, when students begin to use this knowledge to help empower others. Students are encouraged and empowered to think about how language can link “culturally appropriate forms of knowledge that exist outside of their [the students] immediate experience, and to envision versions of a world which is “not yet” – in order to be able to alter the ground on which life is lived” (Giroux, 1987, p. 21).

The theory of critical literacy supports and guides the research for the current study because it is through thinking critically about what is read and making the connection between content and life experiences that true learning is fostered. It is through this lens of critical theory that teacher’s instruction and students’ learning will be analyzed.

The three theories that have been reviewed and discussed – the emerging theory of new literacies, the theory of social constructivism, and the theory of critical literacies – provided the bases and theoretical underpinnings of this study. The emerging theory of new literacies is foundational within the setting of the study. Due to the integration of a one-to-one laptop program, the new literacies of the Internet and other ICTs will be researched to explore their



impact on teacher's instruction and the instructional enhancement of student learning. The study will also investigate the climate and the culture within the classroom and school through the lens of social constructivism, attending to the dynamic that exists as teachers instruct and students learn. Critical literacies, another theoretical framework, are components of new literacies. The current study investigated how the high school's implementation of a one-to-one laptop initiative program has critically impacted student learning and sense of agency, the dynamic between those involved within the study, and the social transformation within the school environment.

### **Technology, Literacy, Teaching, and Learning**

"They [computers] are only as effective as the teacher who implements them," (Grenawalt, 2004, p. 14). Technology alone will not revolutionize curriculum and instruction, but it is evolutionary, and it is changing how teachers teach and students learn. As these changes ensue, the roles of those within the educational environment are evolving, too.

The following sections will explore how technology impacts teacher instruction to enhance student learning. There will be four main areas in which technology's impact will be investigated: (a) curriculum, (b) the role of the teacher, (c) professional development opportunities, and (d) student learning.

#### ***Technology Integration and Curricular Implications regarding Literacy***

When infusing technology into the curricular framework, gaps that teachers have been able to spread sometimes become exacerbated. For instance, setting students in front of a computer screen without the support of a teacher to guide their learning isolates the student (Elstad, 2006). Students, especially those who struggle with reading certain texts, need the

support and collaboration of others to work through the text and negotiate the text's meaning. Isolated islands of instruction do not serve students well. Another challenge to overcome with technology is that not all students are at the same skill level when using technology.

“The roles students and teachers play in the classroom have everything to do with the way in which teaching and learning are approached” (Armfield, 2007, p. ii). A case study was conducted to describe teaching and learning in Teaching Integrated Learning Environment (TILE). Findings supported that TILE was focused on technology integration; however, there was a definite disconnect between what the teacher had intended and perceived and what was actually happening and/or the perceptions of students. Teachers intended for students to be encouraged to think critically and complete assignments that required higher levels of Bloom's taxonomy, namely evaluation. However, students typically were assigned to tasks that required them to compose an answer within a short time that often was a right or wrong answer. The researcher provides several suggestions including one major recommendation for teachers to reflect upon their teaching and through action research “checking intended and actual outcomes” (Armfield, 2007, p. 191). This study illustrates the separation that can exist between what the teacher intends instructionally within the planned curriculum, and how learning is perceived by students.

Technology is neither inherently good nor bad; its value lies in how it is used and integrated within the curriculum and the classroom setting. After all, education and instruction is, “not about technology; it is about learning” (Cuban, 2001, p. 184). It is clear that teachers are the ones who have the most impact on student learning; thus, it is the role of the teacher that becomes so highly important when considering the impact technology has on teaching and learning. The current study investigated how the technology from the rural high school's one-to-

one laptop initiative program was being utilized within the curriculum, the perceived impact it has on a teacher's instruction, and how it is influencing instruction to enhance student learning.

### ***Technology Integration and the Role of the Teacher***

Technology is not the silver bullet of instruction; it is teachers who are among some of the most important factors in student learning (Allington, 2006; Ruddell, 1997; Ruddell & Unrau, 1997). Teachers design instruction and develop the guidelines that structure and foster student learning. Technology does not create great instructional activities, since it is teachers who design and create instructional experiences. A teacher leader, in a school that was studied, fostered interdisciplinary curricular integration, believed in the potential power technology has as a teaching and learning tool, said "it's how you use the tool. ...if we are only using it to word-process then we may as well have typewriters" (Cuban, 2001, p. 69). Teachers can decide which tools to use within their instruction and how they want to use them. It is ultimately the teacher who designs, creates, and scaffolds the instruction for students (Cuban, 2001). However, when students are more familiar with and better understand how technology works, the role of the teacher and the classroom power dynamic can shift (Hagood, Stevens, & Reinking, 2005; Stolle, 2007).

Coote-Thompson (2007) examined teachers' perceptions and attitudes regarding peer tutoring in technology instruction and integration. Using a mixed-method approach, the researcher sought to determine the factors that contributed to teachers' use of peer tutoring in technology instruction and integration. The findings supported that individually factors such as a teacher's gender, age, teaching level, or teaching experience did not have a significant impact on perceptions and attitudes; however, when interacting factors were combined, such as teaching experience and teaching level or gender and teaching experience, there was an influence on

teachers' perceptions and attitudes. Overall, teachers had positive impressions and attitudes toward using peer tutoring in technology instruction and integration. Teachers who participated in the study were aware of the "competence of students who were born in the technological age. They agreed that there are benefits to teachers capitalizing on the technological competence of their students to enhance technology instruction and integration" (Coote-Thompson, 2007, p. 126). Although there were some concerns expressed regarding the role of the tutor, the tutor within in this study "duplicates the teachers' role" (Coote-Thompson, 2007, p. 129). Some teachers expressed concern that the peer tutoring might portray the teachers' incompetence. This shift in power or dualism of power can create anxieties within the classroom inhibiting integrating of technology into instruction.

Stolle (2007) conducted a study focusing on content area teachers' use of ICTs within their classroom literacy practices. Her findings established that there were four main tensions that existed for content area teachers between what they conceptualized and the curriculum that was enacted within the classroom. These tensions included: (a) accessing the necessary and appropriate ICTs needed for a task, (b) having adequate knowledge of the ICT in order to accomplish the task, (c) fearing of what is unfamiliar, and (d) recognizing who benefits from using the ICTs and how these benefits can be assessed. These tensions inhibited teachers within the study from moving past what they knew and that with which they were comfortable.

Within classrooms that are regularly integrating technology, teachers are facilitators of learning, guiding and supporting students as they work and learn. Labbo (2005) reported that, "Teachers who effectively use the Internet for literacy instruction share one characteristic in common – having and sharing of good ideas, which results in the best type of borrowing, because borrowed ideas are eventually transformed to reflect each teacher's instructional style

and the local context” (p. 169). An example is shared regarding a first grade teacher who has leaned from another teacher on a listserv, to preload the webpage she wants her students to visit. This way there will be less time devoted to downloading the site thus maintaining on task student behaviors. Labbo (2005) highlights four key characteristics of teachers who successfully integrate the new literacies within their instruction and curriculum: “(a) making the cutting edge a comfortable place to be, (b) having and sharing good ideas, (c) not allowing a digital divide (the socioeconomic gap between communities that have access to computers and the Internet and those who do not), and (d) making a good print-based literacy curriculum even better” (p. 167). Well designed Internet Projects allow teachers to enhance and extend literature read in classrooms. Through this culture of open collaboration and striving for success, teachers can continue to grow and develop in their technology integration within their curriculum and instruction. The current study researched how the role of the teacher has been influenced as a result of the one-to-one laptop initiative. Exploring how teacher’s instructional decisions have been affected and how they have met the challenge of integrating technology within their instruction provides an essential study perspective.

### ***Technology Integration, Literacy Pedagogy, and Professional Development***

“Staff development needs to have strong, direct connections between technology and the classroom,” (Chamberlain, 2005, p. 51). Providing professional development opportunities that just focus solely on using the technology is important yet insufficient. A different mindset needs to be employed by educators, administrators, and policy makers that emphasize “pedagogy before technology, rather than technology before pedagogy, to help teachers constructively re-envision . . . technology in their classrooms” (McGrail, 2007, p. 83).

Bauer and Kenton (2005) conducted a study investigating teachers, who were considered “tech-savvy” (p. 522), exploring what challenges they faced in order to accomplish the integration of computer technology within their classrooms. The major barriers that existed for these teachers included limited or substandard hardware, insufficient time, and uneven student skills with technology. This study revealed that teachers, who were skilled and competent at using technology, innovative and accomplished when overcoming obstacles, struggled to consistently integrate technology as both a teaching and learning tool. One teacher within the study emphasized, “It would be great if all schools had a tech teacher to coordinate lessons with the classroom teacher. I believe then technology would be best integrated into the curriculum” (p. 531). It was evident within the context of the study, that although there were some similarities in teacher perceptions regarding computer technology integration, the teachers had individual concerns that were unique to them or their content area. Therefore, professional development opportunities addressing the integration of computer technology must focus on helping teachers know “what to do with them” (Bauer & Kenton, 2005, p. 530).

Scott (2006) developed and assessed a professional development experience focused on integrating technology with writing instruction, called the Delaware Writing Project Technology Initiative (DWPTi). This opportunity was content-based and situated within learning. The premise maintained that writing is a social act and technology is able to facilitate its teaching. The DWPTi sought to assist teachers by: (a) increasing their knowledge and skill with technology, (b) increasing their comfort in using a range of technology tools like blogs and wikis, (c) integrating technology within writing instruction, and (d) strengthening their leadership skills. Various activities were conducted to support and assist teachers in achieving these objectives. Through a pre- and post-survey of teacher participants, the researcher collected

and analyzed data as they related to the four objectives of the DWPTi professional development experience. Overall, teachers reported growth within all areas; however, Scott (2006) suggested that by providing additional support for teachers when they returned to their classrooms, even more favorable results might have been obtained.

Ceppi-Bussmann (2006), in another study, analyzed the professional development program, Technology for Improved Achievement (TIA). The program assisted teachers in integrating technology into their instruction, implementing pedagogical practices that were more student-centered, and encouraging collaboration analyzing classroom teaching and learning. The TIA program sought to have a clear purpose, maintain ongoing support, relate its applicability to the classroom, and be collaborative, engaging, and supportive. Overall, participants of this study believed that their time was well spent while taking part in the TIA program, and the collaborative nature of the program took “professional relationships to new levels and helped them make connections between their own learning and their students’ learning” (Ceppi-Bussmann, 2006, p. 191). A facilitator would visit classrooms, thereby continuing teacher’s professional support and collaboration. The facilitator would take the role that was necessary and needed while in the classroom, whether it was a technical support person, co-teacher, or guide. Through customization, a participant teacher was supported in a way that was necessary for him/her at that moment, thus facilitating more favorable experiences with technology integration with instruction. “My ah-ha moments have come when she has been in my room” (Ceppi-Bussmann, 2006, p. 193). The TIA program supported teacher’s professional growth, making professional development learning connect back to the classroom learning environment, transforming concepts into practices.

Leu and Kinzer (2000) report that the deictic nature of literacy-technology integration creates a challenge when trying to conceptualize professional development as it has been traditionally envisioned. It is necessary to rethink how best to disseminate effective knowledge and instructional practices, whether through mentorship, basic collaboration, or planned partnerships. One time or infrequent professional development opportunities on technology are not enough (Leu & Kinzer, 2000). However, if teachers feel pressure to change their instruction in order to accommodate technology, they are less likely inclined to be open to the idea. Therefore, when considering how best to address the issue of professional development, it is important to know the thoughts and opinions of the teachers and to begin in a simplified manner allowing for differentiation for those ready to move forward more quickly in their development (Ertmer, 2005; Zhao & Cziko, 2001). The current study explored the professional development opportunities provided to the teachers who are participating within the rural high school's one-to-one laptop initiative program.

### ***Technology, Literacy, and Learning***

“The emergence of the Internet as an important new information and communication tool demands that we think in new ways about what it means to provide effective literacy instruction” (Leu & Coiro, 2004, p. 3). Integration of computers can be utilized with different pedagogical frameworks; yet, the ultimate effectiveness of computers is based on their implementation, and how it affects student learning. This section highlights research studies that demonstrate how technology can successfully impact student learning and how technology can ineffectively impact student learning.

Research conducted by Pflaum (2004) details that computers are often observed being used as teaching machines, productivity tools, Internet portals, test givers, and data processors



within school settings. Some of these uses are more effective and beneficial for student learning than others. Kist (2005) realized through his research that there was less of a focus on the novelties of technology and a stronger emphasis on supporting literacy skills through social practices in classrooms which regularly integrated technology. “Building on traditional literacies and expanding new literacies can support this generation [Gen M] of technology savvy students’ literacy development by deepening their understanding of and engagement with the written, visual and auditory communication vehicles in their world” (Sweeny, 2007, p. 21).

Researchers support that students are demonstrating increased motivation, engagement, and performance when working in well orchestrated, technology rich, new literacy environments. “Teachers and researchers are finding students are more engaged, relaxed and involved in the learning process when they are allowed to use technology as a learning choice and tool” (Sweeny, 2007, p. 17). Learning becomes more relevant to students when technology can be incorporated into their classroom (Prensky, 2005/2006).

O’Brien (2001a) conducted a four year research project with at-risk adolescents and concluded that they were, “capable and literate if we view them from the perspective of multiliteracies in new times” (p. 1). When sensibly integrated into instruction, technology can move students past traditional methods to include new ways to present information and engage students in meaningful collaborative learning. Technology has the potential to seamlessly infuse instructional lessons and activities that are designed to foster (a) social collaboration, (b) student access to materials, (c) student use of comprehension strategies to promote understanding, and (d) increase student motivation for tasks.

Kist (2003) documents how students in one classroom learned about life of a local fisherman through telephone interviews, digital recordings and pictures for an onsite visit and

field notes they had taken in their notebooks. These students then worked collaboratively with their teacher to sort through their information to create a Webpage report. These uses of multimedia created a rich base of data for students to collect, connect to, and sort through. A deeper learning was achieved as a result of this project in contrast to a more traditional research paper approach. Within the classrooms Kist observed, he rarely found students sitting and listening, but rather observed students actively reading, writing, and thinking. One student said:

I don't dread coming to school in the morning as I did in my previous school. . . . Back in my old school I think I was in school like 50 days out of the whole school year. I had no intention of waking up and going to school. I thought staying home was funner. Now, I was sick one day and it was boring at home (Kist, 2003, p. 11).

Ultimately, when talking with teachers about their curricular choices and instructional decisions regarding literacy, the focus of the discussion was on literacy practices and events, the technology and media employed were of cursory importance. Educators were making conscious decisions to use technology, but its usage was based on curricular and pedagogical outcomes and experiences they desired for their students.

Tierney and Rogers (2004) further illustrate the potential success of student learning when infused with technology. A fourth grade teacher and teacher-librarian worked collaboratively with students in order to create a multimedia project on poetry. The teachers began by immersing students with poetry, and then worked with students to discuss different types of poetry, read them, dramatize them, and discuss their characteristics. The culminating project was a multimedia poem completely written, performed, videotaped, and edited by the students with the guidance of the teachers. The final product included video clips, voice-overs, background music, titles, and transitions. Due to the instructional environment that was created

within this research, students were participating in 21<sup>st</sup> century literacies (NCTE, 2007), since they were able to become, “capable information technology users, information seekers, analyzers and evaluators, problem solvers and decision makers, creative and effective users of production tools, communicators, collaborators, publishers and producers, and informed responsible, and contributing citizens” (ISTE, 2002, p. 4).

To provide instruction that will prepare students for the futures they deserve (Leu, 2002a), educators must take an integrated approach to 21<sup>st</sup> century literacies to help students understand how to access, evaluate, synthesize, and contribute information (NCTE, 2007). When technology misses its mark in successfully integrating into educational and instructional practices, student learning suffers.

For example, Oppenheimer (2004) all too often observed a lone computer in the corner of a room with a dust cover on, used only as a drill-the-skill center, or solely as a reward for good behavior. This is not effective use or integration of technology for optimal learning. Oppenheimer (2004) reports that in Harlem, within one computer lab, students work on ILS (integrated learning system) packaged software that on the exterior looks like a game, but poses questions about basic reading and math problems. These ILS packages are often known as drill and practice programs that work to reinforce a particular skill. After completing at least two of these ILS lessons, the computer lab teacher allows students to play computer games or surf the Internet, a dangling carrot on the end of a stick for “on task” behaviors. The educator within this example should not be criticized though. Initiatives to get technology into the hands of students should be commended. Using ILS lessons occasionally can create learning; however, it is through habitual use that pedagogically they become undesirable.

Teachers can make decisions that intend to support a constructivist framework, but factors surrounding technology implementation and classroom management can create ineffective integration and execution. McGrail (2007) conducted a study that reported somewhat undesired outcomes including students' feelings of social isolation and their off-task behaviors as a result of using laptops within their language arts classroom. During data analysis of the four classrooms that participated, the researcher was amazed at a phenomenon she described as "computer-dependence" in which she observed and noted how little human support students relied and drew upon when working on their final projects. It seems that students preferred to work as individuals, to isolate themselves, in order to get the work done and be finished with the project. This resulted in projects that were of lower quality. The dynamic within this setting was of students sitting in a group working individually instead of individuals sitting together drawing upon the group potential to learn from one another. The student decisions that lead to this phenomenon could be tied to the classroom culture and environment that was created. Participating teachers employed a combination of teacher-centered pedagogy, constructivist pedagogy, and learner-growth pedagogy while data were collected during the study. The research discovered that, "it is their pedagogies and the ways they attempted to support these communities through instructional engagements that played a key role in shaping these teachers' and students' experiences with technology in this study, often contributing to somewhat negative social behaviors and interaction patterns" (McGrail, 2007, p. 70).

With such a wide range of research that demonstrates the successes and inefficiencies of technology integration, attention must continue to spotlight how the integration of technology can positively impact student learning. The current study explored the varied ways in which the integration of a one-to-one laptop initiative has impacted student learning.

This section addressed literature and research surrounding how technology has impacted teaching and learning by focusing on the integration of technology in terms of curricular implications, the role of the teacher regarding technology, the role of professional development in technology infused environments, and how technology impacts student learning. The current study investigated these issues, with regards to how the technology from the rural high school's one-to-one laptop initiative program: (a) has influenced content area literacy instruction and learning within the classroom, (b) has been supported through professional development opportunities for teachers, and (d) has impacted and influenced overall teacher's instruction to enhance student learning.

### **Content Area Literacy Instruction**

Content area literacy is the reading, writing, and literacy that take place across the curriculum and within each content discipline. Vacca and Vacca (2002) posit that content area literacy is needed in order for students to “learn subject matter in a given discipline” (p. 15). Content area literacy is not a skill to be taught in isolation. “The separation of literacy and content area instruction in the schools is often paralleled by the equally disconnected ways that educators conceptualize literacy and content knowledge” (Draper, Smith, Hall, & Siebert, 2005, p. 12). When truly imbedded into instruction, content area literacy instruction allows students to gain contextual, subject-based knowledge in addition to improving literacy skills within that content area, “capitalizing on reading and writing” in order to promote content knowledge (Fisher, & Ivey, 2005, p. 6).

Content area textbooks vary dramatically from one discipline to another; mathematic texts read differently than Spanish texts, than does Shakespeare. Fordham (2006) supports that it

is “precisely because they [content area teachers] are experts in their fields that content area teachers are best equipped to show students how to read the texts unique to their subjects” (p. 390). Draper, Smith, Hall, and Siebert (2005) state that in order for students to “gain facility with content texts, teachers must explicitly instruct their students” in how to read, negotiate, and use these specialized texts (p. 14). However, as new texts are written, immediately after publication they become outdated, not addressing the most current issues, trends, or topics. The information age within which we live allows for a plethora of resources that can assist and support the exploration of content based topics of study. The Internet has been termed the “defining technology for literacy and learning” (Leu, 2005, p. 2). Students currently in classrooms are digital natives (Prensky, 2001), at ease, acclimated, and accustomed to the ever emerging digital tools within this technological age.

By utilizing multi-modal texts that capture the interests of students and give them an opportunity to feel successful as readers, perhaps they will remain turned on to reading and engaged in the learning process across all content areas. Building on traditional literacies and expanding new literacies can support this generation of technology savvy students’ literacy development (Sweeney, 2007, p. 21).

Technology and the new literacies have the potential to enhance and expand curricular content instruction in addition to fostering literacy skills, but each content teacher must establish how best to make the connection between curricular objectives and instructional practice within the content classroom (Swenson, Young, McGrail, Rozema, & Whitin, 2006).

In a study conducted by Andrews (2006), a laptop and online curriculum initiative documented students making “astonishing achievement gains” (p. 42). This initiative reported increased student motivation, increased enrollment, decreased disciplinary issues, and superior

curricular competency that were both measurable and observable. An instructor at the school touted, “The students could learn about a new tool or jig or fixture in class, over lunch or in the evening, design a part on Mastercam, and come into the lab and actually create the part the next day by plugging the laptop into a milling machine” (Andrews, 2006, p. 42). For this school and within these classes, content area literacy was imbedded as part of their conceptual learning, and achieving academic success by implementing tools that fostered this pairing between content knowledge, and content literacy.

Currently, there is limited research focusing on the connection between content area literacy and technology integration. The current study contributed to this incomplete research base, focusing on how a one-to-one laptop initiative’s implementation has impacted teacher’s content area literacy instruction.

### **Technology Initiatives within Schools**

Computer labs are not uncommon in schools and mobile computing labs are frequent fixtures within schools as well, but schools that create the ability for every student to use and work on a laptop are distinctive within this nation, with approximately 35 schools/districts nationwide embarking upon this endeavor (Educational Technology Clearinghouse, 2007). Often referred to as a one-to-one laptop initiative or laptop program (Center for Digital Education, 2004), there are some schools and districts that are on the cutting edge and forerunners in this venture. Four recent initiatives have will be reviewed in this section: (a) the Maine Learning Technology Initiative (MLTI) (Silvernail & Lane, 2004), (b) Virginia’s Henrico County laptop initiative (Development Associates, 2005), (c) New Hampshire’s Technology Promoting Student Excellence (TPSE) program (Bebell, 2003), and (d) the California’s Fullerton School District laptop program (Warschauer & Grimes, 2005). The first laptop initiative was

launched in 1989 at the Ladies's Methodist College in Australia. Since then laptop initiatives have been established throughout Europe. The first large-scale computer initiative within the United States was the 1992 Apple Classrooms of Tomorrow Project (ACOT) (Sandholtz, Ringstaff, & Dwyer, 1997). Overall, there has not been quite this same history with innovative laptop initiatives within the United States; however, Maine's MLTI (Maine Learning Technology Initiative) is the largest serving all the public middle school students and teachers within the state.

The following research highlights four recent studies that have been conducted evaluating laptop initiatives within schools. They have been reviewed in the order of relevance to the current study, the largest scale study that includes the greatest number of participants, the statewide MLTI initiative, to California's Fullerton School District Laptop Program impacting just three of the district's schools, and approximately 1,000 students. The current study was much smaller in comparison, with one rural high school with 82 students enrolled and 12 teachers on staff. Although, due to the size of the current study, it strived to reveal data that provided a more in depth view of the impact a one-to-one laptop initiative has on teacher instruction and the instruction to enhance student learning.

### ***Maine Learning Technology Initiative***

The initial phase of the Maine Learning Technology Initiative (MLTI) was during the 2002-2004 academic year, providing all seventh and eighth grade students and their teachers laptop computers (Silvernail & Lane, 2004). Participant schools (over 240 across the state of Maine) and teachers were also provided with technical assistance and professional development in order to integrate the laptop technology into their curriculum and instruction. A major incentive for the MLTI was to provide support, assistance, and professional development to



create successful implementation. The Regional Integration Mentors (RIM) was the MLTI's first step in training teachers, selecting one teacher from each region to serve as the RIM representative for that region. The selected teacher would help develop practices and procedures for laptop use while assisting with professional development sessions within the participating middle schools. In addition, each participating school nominated a Teacher Leader and a Technology Coordinator to receive extra training in order to serve as leaders within their school. More recently created roles were Content Mentors and Content Leaders. Content Mentors are content area specialists that are statewide leaders in their specialty area. Content Leaders serve in the same capacity as Content Mentors only the area they serve is within their superintendent region.

As a result of Maine's laptop initiative, the MLTI expected to find long-term changes in three main areas: (a) teachers and teaching, (b) students and learning, and (c) school and community. However, for the initial phase, the evaluators of the program sought to answer three main questions: (a) How are the laptops being used? (b) What impacts did the laptops have on teachers and students? and (c) What obstacles did schools, teachers, and students encounter in implementing the laptop program (Silvernail & Lane, 2004)? To research these questions, the evaluation team used a mixed methods approach to collect and analyze data. Data were collected through surveys, interviews at site visits, observations, and document analysis. A limitation of the study was that there was a very limited set of questions that were addressed; more in-depth research was encouraged to generate a fuller understanding regarding the laptop initiatives impact.

The results from the evaluation of MLTI suggested that teachers' use of laptops were contingent on their skill level and their participation in professional development activities

(Silvernail & Lane, 2004). The data showed that the majority of laptop use by teachers was to construct research for lesson plans, develop instructional materials, and to communicate with colleagues. Students were found to use their laptops mainly to find information, while other uses included (but to a much lesser extent) e-mailing, organizing information, creating presentations/projects, taking notes, doing group work, and taking assessments. The level of usage by students correlated to the level of usage by the teachers. In other words, students used their computers more in classes that documented more use by the teacher.

Overall, the data reported that the laptop initiative had a substantial impact on instruction and learning. “I like the individuality that the laptops provide. Lockstep is not required. Students can explore...and create new and creative products to share their learning” (Silvernail & Lane, 2004, p. 15). There was a consensus between both teachers and students that laptops were highly beneficial to access and learn about the most up-to-date information; something that both parties felt were lacking with their traditional textbooks. One teacher commented:

A text book, particularly a social studies textbook, becomes obsolete or very dry after a short period of time and because the World Wide Web and the wireless access that we have here, it’s an almost unlimited amount of resources that we can access. It gives the teacher a lot more flexibility to find things that are relevant, that tie into the curriculum, that tie into the learning results, whereas before I felt more constricted in what I could do (Silvernail & Lane, 2004, p. 16).

A student said:

Well, I think that it makes them [classes] a lot more interesting because before hand we had to use mostly outdated textbooks and so the laptops are a lot more up-to-date and

actually it does help you motivate, motivates us a little bit because it's a lot more interactive (Silvernail & Lane, 2004, p. 19).

Teachers and especially students realized that the Internet allows access to legitimate and current knowledge. Researching on the Internet creates more meaningful, motivating, and engaging situations for learning.

Even though the MLTI implementation had positive impact on teachers and students, there were three areas in which obstacles arose: (a) professional development, (b) logistics, and (c) expenses (Silvernail & Lane, 2004). Teachers believed that more could be done for professional development, and for those who were acquiring skills. They still considered that there was a lack of time to develop and hone these skills. Some believed that support was not always available or would show up to "put the fires out" when there was a problem. Half of the schools worked to lessen this obstacle by creating iTeams, student technology support teams.

This research and initiative evaluation found the MLTI to be a success. The researchers suggested that additional research still needed to be conducted regarding similar initiatives impact on student learning, their academic performance, student attendance, and impact on disciplinary issues. Silvernail and Lane (2004) found that one factor that seemed to contribute to the success of the initiatives implementation was the presence of "key individuals in the schools who served as champions of the laptop program and provided strong leadership during implementation of the program" (p. 34). This initial report of the MLTI, supports the basic framework for areas in which to conduct inquiry and collect data.

### ***Virginia's Henrico County Laptop Initiative***

During 2001 the Henrico County Public School system implemented a technology program. By the 2003-2004 school year, over 20,000 students, their teachers and administrators

were being impacted by this program (Development Associates, 2005). The goal of the program was to integrate the electronic technology throughout the curriculum including staff development courses for teachers. The technology initiative established a virtual classroom eLearning platform within all the high schools and middle schools. iBooks were also given to each student and teacher within the program. This evaluative study was conducted so that decisions could be made about the future of the program. This study collected data through survey research. Parent surveys were conducted by telephone and mail. Teacher, administrator, and student surveys were self-administered, web-page surveys. Statistical sampling was not used because all participants within the laptop initiative were surveyed.

After the data were analyzed, research revealed that students used their iBooks more frequently at school than at home (Development Associates, 2005). The laptops were used by students mainly to work within Appleworks (an office suite for Apple computers), to complete class work and homework, to use Virtual Share (a shared server for HCPS), and to conduct research on the Internet for school work. Students reported that laptops made research easier, but there was some dissatisfaction with its need for maintenance and repairs. The majority of students had to turn their laptop in for repairs at least once during the 2004-2005 academic year. When laptops were being repaired, students obviously would not have them for use in their classes. This was not just an inconvenience for students, but for teachers as well. Teachers reported that their work load increased resulting from this laptop initiative, taking more time to prepare for courses. For the small number of students who did not have a computer that day, for whatever reason, teachers would prepare for materials via technology, as well as paper copies for those without available technology to use. However, despite this increased work load, teachers believed that technology use positively impacted student attitude and behavior. The training that

was provided to teachers was reported to be relevant and useful by most, but almost two-thirds of teachers indicated they would like to have had specific training on developing digital curricula (Development Associates, 2005). Administrator comments fell heavily on concern for laptop misuse by students. Almost two-thirds of administrators believed that the filtering system being used was not sufficient in preventing students from accessing inappropriate websites.

In the conclusion of the study, the researchers recommended that to increase the value and success of the laptop initiative, all students have access to a laptop in class each day (whether it's their own, or one that's borrowed while theirs is being repaired), and additional training opportunities for teachers and administrators. It was also suggested that the district might consider reviewing software to be installed that would allow teachers to have more access to what was on student computer screens (the ability to block access to everything but what was pertinent to the lesson). The data analysis from this study informed the current research regarding how the technology is used within one-to-one laptop initiative program, and what support or professional development teachers want and need within these environments.

### ***New Hampshire's Technology Promoting Student Excellence***

Fueled by the success Maine had with their MLTI laptop initiative, New Hampshire's governor in 2003 announced his plan to spearhead a similar program across six of the state's struggling schools (Bebell, 2003). He sought to replicate some of the same successes that Maine had, specifically increased attendance and decreased disciplinary issues. A program that was completely privately funded, New Hampshire launched its one-to-one laptop initiative in January 2004 called Technology Promoting Student Excellence (TPSE). The program began providing professional development and program support the year prior to implementation; therefore, by the time the official program launch began, all were versed and prepared to immediately begin

implementing the initiative's technology. The program provided Apple iBooks to each student, teacher, and administrator within the six participating schools, along with digital cameras, printers, video cameras, and a video conferencing camera as well.

With a drive to research the impact of the newly integrated program, this study (Bebell, 2003) reported findings as a result of the program's first six months in implementation. Data were collected through a pre- and post-survey administered to students, teachers, and administrators. Data sought to document changes in instructional practices, classroom culture, and overall perceptions about the educational technology.

Bebell (2003) reported that technology use increased within classrooms after the implementation of the TPSE program, at times increasing from practical non-existence to nearly daily integration. Teachers reported using technology for lesson planning, research, and preparation, communication, adaptation of lessons for special need students, and general classroom instruction. There was a statistically significant increase in teacher beliefs regarding the importance of computers within teaching, and their confidence in using computers as a teaching tool. Teachers also expressed their perception that due to the TPSE program, students worked harder and the quality of that work improved, it assisted students in grasping difficult concepts, and it helped students gain a deeper understanding of content being studied. In addition to shifts in perceptions at the classroom level, teachers reported that there was an overwhelming shift in the culture and environment school wide.

Data also reported that the TPSE program did in fact meet its desired goals of increased student participation, attendance, motivation, and engagement/ interest level. Data analysis reported striking transformational effects even as it was just in its infancy stages of implementation. This study provided initial indications of participant perceptions within a one-

to-one laptop initiative environment. The current research intended to collect more in depth data regarding participant perceptions of the impact the technology has made on teaching, learning, culture, and climate within the school and classroom.

### ***California's Fullerton School District Laptop Program***

During the 2004-2005 academic year, the Fullerton School District launched a one-to-one laptop learning program within three of its schools (Warschauer & Grimes, 2005). In total there were over 1,000 students who were provided with laptop computers. Funding for this program was through a combination of federal and parental funds. The program included not only the Apple iBook computers, but also appropriate educational software, establishment of wireless Internet access, technical support to maintain equipment, and a professional development program to prepare teachers to make use of the laptops.

Research was conducted by Warschauer and Grimes (2005) to evaluate the success and impact this initiative had made within its first year of implementation. Multiple data sources were collected and analyzed including surveys, observations and field notes, interviews, and documents and records from students and teachers who participated within this program. HyperResearch, a qualitative analysis computer software program, assisted in coding the data, ultimately resulting in the overall themes of (a) types of laptop use, (b) response of participants, and (c) benefits and drawbacks of the laptop program. Positively, researchers found that laptops were used regularly within all three participating schools. However, within two of the schools there seemed to be more of a push or commitment to the program hiring teachers who expressed a special interest in using technology within instruction and structuring the building to encourage collaboration between teachers. The other participating school, while still dedicated to the

program, had a number of challenges that made for overall steeper learning curves, slower implementation, and less usage than the other two schools.

Research showed that laptops were used by students to (a) write and revise, (b) gather online information, (c) analyze data, (d) use multimedia, (e) interact with educational software, and (f) study individually (Warschauer & Grimes, 2005). Whereas some might argue that using a laptop to write and revise work is not true integration of technology for learning and the computer is acting as a glorified typewriter, this study found many advantages when students used computers to write and revise. Students tended to write more, revised their work more readily (turning in multiple drafts), provided easier access to teachers to assess student progress and provide feedback, and wrote in a greater variety of formats and genres for more authentic purposes. The instance in which these advantages were not valid were when students used the computers but had weak keyboarding skills which inhibited writing.

When accessing online information, students tended to have three main purposes: (a) creating background knowledge, (b) facilitating “just in time” learning, and (c) supporting research projects. “People are much better able to make use of, and remember, information if they receive it at the point of need,” technology facilitating perfect opportunities for “just in time” learning (Warschauer & Grimes, 2005, p. 7). For example, when students were observed in class, they might access the Internet to gain additional background information about a topic thus providing “just in time” learning in order to be successful on an assignment. Analyzing data typically took place in science and math classrooms through work with spreadsheets, and in social studies classes when creating timelines, maps, or charts. Use with multimedia impacted students through instruction, interpretation, and the production of knowledge. Students were observed using GarageBand (an audio editing software) to compose music that they believed



reflected the meaning and emotion within poetry, using iMovie (a video editing software) to create an advertisement trailer for a novel they read, and using iMovie to illustrate the underlying concept of each of the Ten Amendments in the Bill of Rights. In prior research that had been conducted, multimedia usage was also witnessed. Conversely, within the three participating schools of the initiative, student tended to work on projects that “focused more on academic content and communication skills, rather than on learning the software” (Warschauer & Grimes, 2005, p. 9).

One of the earliest and easiest ways to begin integrating technology within education is through interactions with educational software (Warschauer & Grimes, 2005). Successful software was very content specific including software like Cells Alive! and Froguts for science classes. Finally, students used their laptops to individually support their studying and learning in a number of ways, through creation of digital flashcards, recording and organizing homework assignments, and note taking. Taking notes, although simple enough, is a very important skill for success in higher education, and laptops facilitated this skill. Students preferred to type than write by hand, notes were more legible, easier to work with (revise, cut/paste into other documents, share), and they were easier to store and access. The challenge of laptop usage was that some students used it to play games within class, and some students were able to navigate around the firewall to access and share inappropriate material like pornography.

Teachers who were both surveyed and interviewed were in overall support of the laptop program with the majority perceiving that it raised student interest in class, promoted collaboration and cooperation, encouraged more in depth exploration of topics, produced higher quality student work, and encouraged students to worked harder (Warschauer & Grimes, 2005). The biggest frustration for teachers was the technical problems. Teachers also commented that it

was frustrating learning how to integrate laptop use into instruction with so many other educational challenges. Students, too, supported the laptop program and had overall positive evaluations of its implementation. The vast majority reported that they believed schoolwork was more interesting after receiving the laptops. When asked what students thought the best thing was about the laptop program, students shared they liked the laptop as a study tool; it was valuable for online research and information, and for the computer-based project work.

Researchers also collected data with regards to discipline and attendance rates for the participating schools. Attendance within all participating schools was high, over 95% during the year the laptops were introduced (Warschauer & Grimes, 2005). It was reported that there was a reduction in suspension rates after the implementation of the laptop initiative. Interviews and observations suggested that “laptop use (was) very engaging, and we are thus not surprised that students attended more frequently and tended to avoid behaviors that would force them to stay home through suspension” (Warschauer & Grimes, 2005, p. 17).

In the midst of all the data and research collected and analyzed, the biggest benefit and greatest success was in promoting 21<sup>st</sup> century learning skills, information and communication skills, thinking and problem solving skills, and interpersonal and self-directional skills. Students were found to be highly engaged, referred to as “sponges,” absorbing all types of instruction that involved combinations of texts, images, audio, and video. Teachers were also able to flexibly use technology on a daily basis. The stress and unpredictability of having to schedule a time for a computer lab was removed from the equation. Teachers were also able to differentiate their instruction with greater ease; students could choose from a wide and varied array of materials, and demonstrate their learning through more individualized assignments.

The major challenges faced by this program involved technical support, scheduling and implementation, teacher development and collaboration, financing, and community support. Although these challenges were significant to consider, the participating schools were creative in how they sought to ease the impact these challenges had upon the overall experience. For instance, one school involved knowledgeable student volunteers who would intern as technical support in a program called “SWAT” (Students Willing to Assist with Technology). Another school decided to implement block scheduling as opposed to the more traditional 45 minute classes to allow time for more autonomous and integrative project work and research activities within classroom instructional periods.

The first year implementation of this laptop program was fairly smooth considering some of the challenges that were faced. The district continued to expand the program weighing carefully their decisions. Because programs like these impact not just student education for that year, but for how education will look for the district’s future students. One thing was for certain - collaboration was key for these ambitious programs to thrive and succeed. This study impacted and influenced the current research by spotlighting how a one-to-one laptop initiative program’s technology was being utilized by students to support their learning and addressing multiple perspectives of participants regarding the value of technology on student learning.

All four of the reviewed research studies (the MLTI, Virginia’s Henrico County Laptop Initiative, TPSE, and California’s Fullerton School District Laptop Program) provided guidance to the current study and influenced the direction of the data collection. Maine’s MLTI guided and supported a basic framework for areas in which to conduct further inquiry and collect data. Virginia’s Henrico County Laptop Initiative was very large in nature, but provided insight

regarding how the technology was used, and what participant perceptions were pertaining to what professional support and development was needed to more effectively utilize the available technology. New Hampshire's TPSE provided participant perspectives regarding successes and struggles that were faced as a result of the initiative which will guide this inquiry when collecting data on technology's impact on teacher content area instruction, student learning, and the overall culture and climate within the school and classroom settings. California's Fullerton School District Laptop Program impacted and influenced the current research by spotlighting how a one-to-one laptop initiative program's technology was being utilized by students to support their learning and addressing multiple perspectives of participants concerning the value of technology on student learning.

### **Summary**

The current study builds upon the theoretical foundations of the new literacies, social constructivism, and critical literacy discussed within this chapter. It is with earnest intent that this study attempts to contribute and extend the current research base that has been provided within this chapter. This chapter also concentrated on the literature and research base focusing on technologies' impact on teaching and enhancement of learning, addressing its curricular implications, the role played by teachers, implications for professional development, and its overall impact on student learning. The literature base for content area literacy was reviewed as well. Previous research on one-to-one laptop programs offers a framework by which to understand the successes and drawbacks these early adopters of technology faced; however, the research tends to analyze the data through a wide lens and with an evaluative agenda. Greater understanding and higher resolution is critically needed pertaining to the integration of these resources within literacy instruction in content area classrooms. It is this focus on content area

instruction and the instructional enhancement of student learning that is central to this study, differentiating it from previous work in this field.

The following chapter emphasizes the methodological framework and foundation for the current research. The purpose of the study will be revisited and attention focused on the research design, setting, participants, the role of the researcher, the projected research timeline, data collection and data analysis procedures, and actions that were taken to establish trustworthiness.

## **CHAPTER 3 - Methodology**

The purpose of this research is to explore how the one-to-one laptop initiative has been infused into content area classrooms; thus, exploring how content area literacy is being taught, how new literacies are being utilized, and how critical literacy is being fostered within participating content area classes. Information relating to the methodological framework of this study is organized into the following sections: (a) research design, (b) participants, (c) research setting, (d) role of the researcher, (e) research timeline, (f) data collection, (g) data analysis, and (h) establishment of trustworthiness.

### **Research Design**

Using a qualitative tradition of inquiry, this study will follow a case study methodology (Stake, 1995). According to Creswell (1998), a qualitative inquiry is a tradition of inquiry that “explores a social or human problem....builds a complex, holistic picture, analyzes words, reports detailed views of informants, and conducts the study in a natural setting” (p. 15). Bogdan and Biklen (1998) identify five common features that are typified within qualitative research which are: (a) naturalistic, (b) descriptive, (c) inductive, (d) concerned with process, and (e) concerned with meaning. Naturalistic is a word typically associated with ecology and biology, but it is also commonly linked to qualitative inquiry (Bogdan & Biklen, 1998). Qualitative researchers believe that the context and the actions within which they occur cannot be separated. More can be understood by looking at situations as a result of the context that surround them. Therefore, qualitative research is naturalistic.

The data collected in qualitative studies is descriptive, relying not on statistics or numbers, but rather on rich descriptive words that paint a picture of the study for the reader. Descriptive data are filled with quotations and descriptions that aim to portray the situation as closely as possible reflecting how it actually happened. Once data are collected, qualitative researchers analyze the data inductively, a bottom-up or emergence of themes approach (Bogdan & Biklen, 1998). Another basic concept of qualitative inquiry is its concern with the process and not just the outcomes. The path people take and how they negotiate meaning within situations is highly valuable to the qualitative researcher. Finally, meaning is of the utmost importance; how individuals make sense of their lives and the perspective of the participants is valuable, and capturing it within an accurate light is one of the goals of a qualitative researcher. This research seeks to obtain an “insider” perspective for the study – collecting thick descriptive data, focusing on the context, gathering participant perspectives, and developing an overall understanding as a result of the study, thus making qualitative inquiry an appropriate choice for the research design.

Case study, a research tradition that is classified within qualitative inquiry, is chosen as the specific research design for its succinct fit with the proposed research. Case study research (Stake, 1995) is conducted in a natural setting with the researcher being a noninterventionist, to allow for the ordinary activities of the case to not be disturbed. Unique to and typical of case studies is the case itself. The case, within a case study, is a bounded system with clear parameters. The bounded case within this study is the high school within which the one-to-one laptop initiative has been implemented.

Stake (1995) groups case studies into three different categories: intrinsic case studies, collective case studies, and instrumental case studies. Intrinsic case studies are utilized when a researcher’s interest lies within the case itself, collecting data to learn more about the specifics of

the case. A collective case study is the collection of multiple cases that are chosen to better explain and highlight an instrumental case. This study's case would be classified as an instrumental case study. Instrumental case studies focus on a certain program or process. With case studies, the intent is not to generalize, but to particularize and truly understand the case. Researchers of cases are highly concerned with the context surrounding the case because of the insight it provides regarding that particular case. Discovering the background and the history regarding origin of this one-to-one laptop initiative program becomes vital in order to understand the context of the case.

All case studies contain issues which are the foci of case study research. They often create effective research questions as well. Issues can be categorized as *etic* and *emic* in nature (Stake, 1995). Emic issues are those that emerge from the participants within the case. These issues are found internally within the case study. Whereas, etic issues are ones that are of interest to the researcher and are external in nature. It is the goal of this proposed case study to begin the research guided by questions that are etic in nature; however, it is also the goal of the researcher to remain open to emic issues that emerge as the researcher collects data and becomes immersed within the setting of the study.

The unique and bounded nature of this study lends itself to the case study research design. Capitalizing on the natural setting of the research in a rural high school setting, data collection procedures invite rich descriptive data and inductive analysis. Therefore, this study is well positioned within the qualitative inquiry of research.

### **Research Setting**

This study was conducted at a singular site, Cardinal Creek High School (all proper names have been omitted to maintain the privacy of participants). Cardinal Creek High School



was chosen for its innovative one-to-one laptop initiative. Entering its third year of the initiative, the high school maintains dynamic evolution and development as the entire high school population, students and staff, continue to participate and persist within the one-to-one initiative. The Cardinal Creek School District is a small, rural, Midwestern, public school system, including one grade school (K-4), one middle school (5-8), and one high school (9-12). The district can trace its roots back to 1899 when its common school was voted on to become a graded school. There were originally four rooms, three teachers, and roughly 76 students. In 1905 the school became an accredited four-year school; there was one graduate in 1909. Cardinal Creek became a rural high school in 1923. During the late 1940's and early 1950's, the district consolidated with another smaller rural district to become reflective of what the district resembles today, serving 319 square miles with one elementary school, one middle school, and one high school. As the school's community and needs have changed, so too has the district evolved to meet the trends and demands of the time.

For the past two decades the Cardinal Creek School District has been forward thinking in regards to its use and availability of technology. Originally, a computer lab was created at both the high school and middle school, and then as laptop technology grew, the district made the decision to add COWs (computer carts on wheels). These COWs were comprised of laptop computers that could be checked out and wheeled into individual classrooms for special projects or for special lessons. In 2005, the district expanded the reach of their technology to institute a one-to-one laptop initiative, all the while maintaining the computer labs and the COWs. Within Cardinal Creek's one-to-one laptop initiative, every student, 9<sup>th</sup> grade to 12<sup>th</sup> grade, and every classroom teacher was issued an iBook laptop. The initiative began mid school year in 2005 by providing an iBook laptop to all students within the high school. Several weeks later, the district

issued iBook laptops to all full-time teachers within Cardinal Creek High School. Teachers were not provided professional development regarding the utilization of the laptops or integration of the laptops within pedagogical practices prior to the initiative. Then, during the first year of the laptop initiative, there were some semi-regular Wednesday afterschool opportunities for teachers to attend professional development sessions. During these afternoons, the District Technology Consultant and the High School Instructional Technology Coordinator would facilitate and encourage teachers' growth and development as they utilized the laptops and implemented their usage within classroom instruction. Often the session topics were centered upon interests and specific requests made by the teachers themselves.

There was not one driving reason behind the ultimate decision to implement this one-to-one laptop initiative, but rather, the motivation was varied and multiple, ultimately leading to the decision to implement the one-to-one initiative. One such motivation to implement the one-to-one laptop initiative at Cardinal Creek High School was to help prepare district students for the technology they would encounter and need in college and by extension during the 21<sup>st</sup> century. Another motivation behind the implementation of the one-to-one laptop initiative was to attract students to the school and district, thus increasing enrollment.

### ***School Site and Population***

Research was conducted within a small, rural, Midwestern high school. Located within America's heartland, Cardinal Creek High School serves an area of 319 square miles and has an enrollment of 69 students within the high school. The average classroom within the school is between 7-10 students. With a student to teacher ratio of 10:1, the school prides itself on being able to provide individualized instruction to its students. Within the district there are a total of 25 certified staff members with an average of 16 years of experience and 48% have earned a

master's degree. The high school employs 11 teachers, each teaching within a different content area. The teaching staff is comprised of a mix of both veteran teachers and teachers who are early within their teaching careers.

Cardinal Creek High School contains 9<sup>th</sup> through 12<sup>th</sup> grades. There are 11 students in the freshman, 9<sup>th</sup> grade, class; there are 19 students in the sophomore, 10<sup>th</sup> grade, class; there are 14 students in the junior, 11<sup>th</sup> grade class, and 25 students within the senior, 12<sup>th</sup> grade class. Of the 69 students enrolled within the high school, 33 students are female and the remaining 36 students are male. Regarding the ethnicity of the student population, 100% of Cardinal Creek High School students are Caucasian.

Based upon the standardized scores from the MAP (Measures of Academic Progress) test, AYP (Annual Yearly Progress) reports, and Scholastic's Reading Counts summaries, a foundation was established for Cardinal Creek High School students' literacy competence. The MAP exam reports scores through a RIT (Rasch unit) score. In Scholastic's Reading Counts report, lexiles are referenced. A lexile score accurately pairs a student with a text that is readability appropriate for him/her. The texts should not be too easy for the student so that they are not challenged, but it should not be too difficult eliciting frustration from the student.

Therefore, the lexile range allows for students to choose books that are instructionally and developmentally appropriate for them. On the other hand, RIT scores are intended to measure what skills and concepts students have mastered versus what skills and concepts they are working on within a certain subject. Therefore, there is a difference in purpose between the RIT score and the lexile scores. The RIT score supports and guides instructional decisions based upon data of what a student is academically ready to do. Whereas, the lexile score is meant to be used by the teacher and the student in determining texts that are instructionally suitable. So, it

would be inaccurate to make any direct comparisons between lexile and RIT scores. However, RIT scores and lexile scores have been aligned to grade levels so that there can be a common point of reference when discussing students' reading proficiencies. Table 3.1 shows the alignment of lexiles and RIT scores with what is considered "at grade level."

Through MAP data, students mean RIT scores were generated at each grade level. Table 3.2 illustrates that students at the secondary level are on average falling below grade level in regards to the skills and concepts in reading.

**Table 3.1 Alignment between Score Ranges and Grade Levels**

		RIT Score Range	Lexile Range
<b>Grade Level</b>	<b>1</b>		200-400
	<b>2</b>		300-500
	<b>3</b>	191-200	500-700
	<b>4</b>	200-207	650-850
	<b>5</b>	208-214	750-950
	<b>6</b>	215-221	850-1050
	<b>7</b>	222-226	950-1075
	<b>8</b>	227-230	100-1100
	<b>9</b>	231-233	1050-1150
	<b>10</b>	233 - above	1100-1200
	<b>11</b>		1100-1300
	<b>12</b>		1100-1300

Note:  
 Information retrieved from:  
<http://whs.wsd.wednet.edu/Faculty/Zobelr/RITScores.htm>  
<http://www.lexile.com/DesktopDefault.aspx?view=ED&tabindex=6&tabid=18>

**Table 3.2 Mean RIT Scores of Cardinal Creek Students (based on MAP data)**

	9th Grade	10th Grade	11th Grade
<b>Winter 2008</b>	222.9	223.7	223.3
<b>Fall 2007</b>	217.3	221.8	221.5
<b>Spring 2007</b>	224.4	218.9	231.8
<b>Fall 2006</b>	226.1	221.8	229.1

**Legend:**  
Below Average for Grade Level  
Above Average for Grade Level

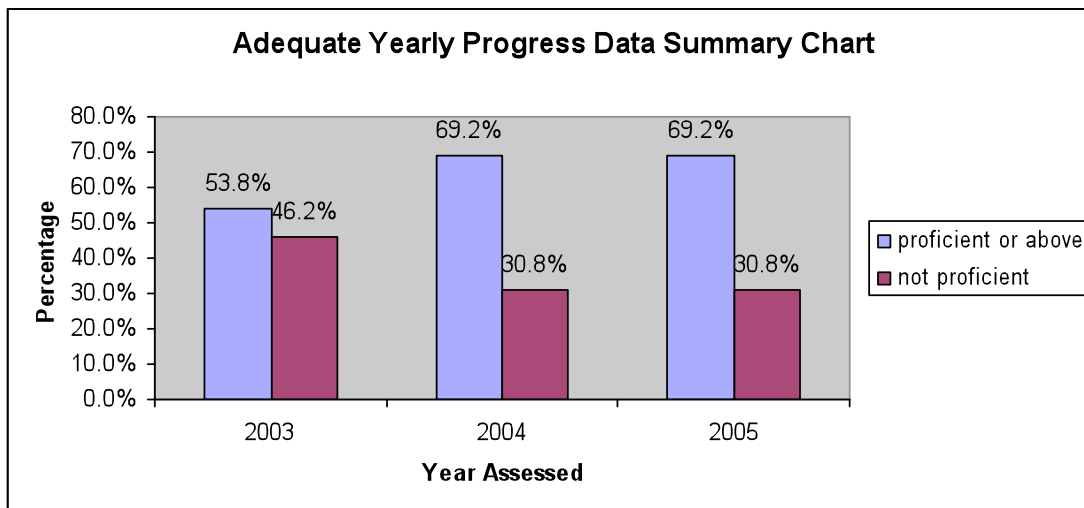
**Table 3.3 Mean Lexile Scores of Students (based on Reading Counts data)**

	9th Grade	10th Grade	11th Grade	12th Grade
<b>2005</b>	968	1028	847	1232
<b>2006</b>	968	1028	847	1232
<b>2007</b>	968	1028	847	1232
<b>2008</b>	968	1028	847	1232

**Legend:**  
Below Average for Grade Level  
Above Average for Grade Level

Table 3.3 illustrates the lexile levels of students at Cardinal Creek High School. It is apparent that there is consistency in student scores from year to year; the mean lexile score of students is exactly the same for the past four years. These data support the data retrieved from the mean RIT scores of students; at the high school level students are reading texts that are instructionally appropriate for them, but at a level below what is considered grade level. Based upon the AYP scores obtained over a 3 year period from 2002-2005, students at Cardinal Creek High School have met the AYP standards in reading. Figure 3.1 illustrates the AYP data summary over a 3-year time span for Cardinal Creek High School.

**Figure 3.1 Adequate Yearly Progress (AYP) Data Summary**



Overall, students within the school have been meeting the benchmark score or above in order for the school to meet AYP. However, in the past two years, students achieving proficient or above scores have evened out. The percentage of students needed at proficient or above to meet AYP continues to rise. In 2003 the reading target was 44% of students at or above proficient, in 2004, 51% of students at proficient or above on reading was necessary to make AYP, and in 2005, 58% of students had to score in reading at proficient or above in order to meet AYP.

The district's mission is to "develop and maintain a functional curriculum that will give maximum opportunity for achievement to all students." To support this mission, and to provide students with the latest in technology to compete in today's world, the school implemented a laptop initiative in 2005. Each student and teacher within the high school had been issued a Macintosh iBook laptop as a part of the initiative. At the onset of the initiative, students were the first to receive their iBooks at the start of the fall 2005 semester, while teacher iBooks were distributed at the end of the fall 2005 semester. Funding for this initiative was included as a line item for the district's budget. The decision not to fund the one-to-one laptop program with a grant was made in order to ensure the continuation of this program. Cardinal Creek High School's principal stated, "grant funding can come and go, but the district and its surrounding community wanted this one-to-one laptop initiative to endure." Due to limits in budgetary allocations, Cardinal Creek purchased sufficient iBooks for students and staff at the high school for this one-to-one laptop initiative. Additionally, an insurance policy was taken out in order to cover, maintain, or replace any of the iBook laptops, when/if that was necessary. However, the district did not opt for blanket installations of supplementary software onto the laptops, and there were not additional service or support packages included within this initiative for either technical or pedagogical issues. This one-to-one laptop initiative supports the pre-established presence of

a computer lab, classroom computer, a computer network, and connectivity to access the Internet. Cardinal Creek High School also uses a program that allows students and parents alike to check on assignments, grades, and attendance on an ongoing basis.

The district also participates in the Accelerated Reader program (AR), just recently transferred over from Scholastic's Reading Counts program. AR is designed as a K-12 program for computer-assisted, student self-evaluation regarding reading comprehension. A part of Renaissance Learning, AR touts that its technology personalizes reading practice to each student's level, is able to manage reading activities, is able to assess students' reading skills with four different types of quizzes, and "builds a lifelong love of reading and learning" (Renaissance Learning, 2008).

## **Research Questions**

To guide the research and data collection of this study, I explored the overarching question: What is the perceived impact the one-to-one laptop initiative has had on teacher's instruction to enhance student learning? To create a framework for this exploration, I answered the following related questions:

1. How has the one-to-one laptop initiative's technology been utilized by participants?
2. How has content area literacy instruction been effected as a result of the one-to-one laptop initiative?
3. What has been the role of the new literacies as a result of the implementation of the one-to-one laptop initiative?
4. What has been the role of critical literacy within classrooms with the one-to-one laptop initiative?

## **Participants**

Gaining access to a school to conduct research can often be challenging, yet I was fortunate to be welcomed into the school, the community, the classrooms, and the academic lives of participants within this study. Approval was sought and attained from the IRB to initiate and conduct this research study (Appendix B). Permission to carry out research was also granted by the principal of the high school (Appendix C). Additionally, the superintendent and members from the school board voiced their support for my presence and the focus of my research. The next access point was obtaining informed consent from the specific, individual participants within the study: (a) teachers, (b) students, (c) administrators, and (d) parents. All participants were associated with the one-to-one laptop initiative, but all had unique views and perspectives regarding Cardinal Creek High School's one-to-one laptop initiative.

### ***Teachers***

All high school teachers were solicited to participate in this study. To obtain a diverse and representative cross section of the perceived impact the one-to-one laptop initiative was having on content area literacy, the new literacies, and critical literacy within Cardinal Creek High School, the researcher encouraged all teachers to participate. In the end, 10 out of the 11 total teaching staff at the high school chose to participate in some way. The teacher who chose to abstain, taught art part-time at the high school, she was rarely accessible during data collection. Table 3.4 illustrates the different content areas and the teachers (pseudonyms) who agreed to participate in the study.



**Table 3.4 Teacher Participants**

<b>Content Area</b>	<b>Teacher Pseudonyms</b>
Agricultural Technologies	Mr. Tom Klein
Business/Computer Technology	Ms. Pam Nichols
Family and Consumer Services	Ms. Jamie Day
Instrumental and Vocal Music	Ms. Carrie Parker
Language Arts/ Spanish	Ms. Amy Hamilton
Mathematics	Ms. Donna Apple
Physical Education	Mr. Bob Baker
Science	Ms. Janet Thompson
Social Studies	Mr. Mark Smith
Special Education	Ms. Carly Michael

### *Students*

Observing within different content area classrooms, I saw a vast majority of the student population. Due to the manageable size of the school, all students were given the opportunity to directly participate in the study by completing an informed consent form with parental approval (Appendix D). Data from any student were only collected after informed consent forms were completed and returned to the researcher. Forty-three out of 69 students (62%) within Cardinal Creek High School agreed to participate in the study, 22 of the senior class (88%), 5 juniors (36%), 10 sophomores (53%), and 6 of the freshman class (55%).

In addition to student observations, I also collected data through structured and informal interviews. The structured interviews were based upon focus group interviews; however, due to the enthusiasm and support by students who wanted to participate in the study, the focus group process was modified into “tandem focus group interviews.” During these tandem focus group interviews, students were divided into two sections - those who were seniors (12<sup>th</sup> graders), and all other classes (9<sup>th</sup>, 10<sup>th</sup>, and 11<sup>th</sup> graders). Krueger and Casey (2000) caution not to group students outside a two-year age span when conducting focus groups with adolescents, because

the influence of peer pressure can influence comments. By purposefully grouping students this way, varying perspectives were elicited. Although I slightly extended the suggested age span to when conducting student group interviews, I wanted the unique perspective of the senior student group. Therefore, throughout all group interviews with the 9<sup>th</sup>, 10<sup>th</sup>, and 11<sup>th</sup> graders, I was attentive to minimizing any peer pressures, and validated comments and perceptions of all students who choose to participate. Since this one-to-one laptop initiative was within its third year of implementation, senior students were able to provide insights on their perceived impact the one-to-one laptop initiative had upon teaching and learning within the school over time. When these seniors were freshman (9<sup>th</sup> graders), the initiative was not yet implemented. Now as 12<sup>th</sup> graders, most students will have had three years of experience with the one-to-one laptop initiative.

### *Administrators*

Administrators include a variety of individuals who are responsible for making decisions regarding the overall implementation and direction of the one-to-one laptop initiative. Those who were willing to participate in the proposed study completed an open-ended survey, participated in informal interviews, and were asked to participate in structured individual interviews. As the study progressed, administrators who were most closely related to the one-to-one initiative were asked for follow-up interviews to extend, clarify, and confirm initial findings that were being generated. Through the collection of data from administrators within a variety of roles, a broader understanding of the entire laptop initiative was generated, discovering the justifications behind its implementation and the vision guiding its future development. Table 3.5 delineates a list of the roles of administrators who participated within the study.

**Table 3.5 Administrator Participants**

<b>Administrator Participant Roles</b>
District Superintendent
High School Principal
District Technology Consultant
High School Instructional Technology Coordinator
School Board Member(s)

***Parents***

The parents of high school students provided yet another unique perspective regarding the one-to-one laptop initiative at Cardinal Creek High School. All parents of high school students were eligible and encouraged to share their views and participate in this study. My initial contact with parents was through attending Cardinal Creek High School’s parent/teacher conference night. During conferences, I set up a table with an informational brochure highlighting key elements of this study and my presence within Cardinal Creek High School. I displayed a poster soliciting input about the one-to-one laptop initiative (Appendix E). To access this participant group for data collection, in addition to attending the parent/teacher conferences, I mailed home a copy of the informational brochure, an open-ended survey, an informed consent form, and a self-addressed envelope to ease and expedite the return of each parental participant’s documentation and data.

**Role of the Researcher**

I, as the researcher in the study, played the role mainly as that of an observer. On the continuum from participant observer to complete observer (Bogdan & Biklen, 1998), my role leaned more heavily toward that of a complete observer, not participating in the activities within the setting. As I become acclimated to the setting, and as participants grew in comfort and acceptance of my presence within the school and individual classrooms in which I observed,

participants would infrequently draw me into the role of a participant observer. I was never in the role of a participant observer for an entire class period, but rather for only short periods of time before transitioning back into the role of complete observer.

During tandem focus group, individual interviews, and impromptu informal interviews, I posed open-ended questions that made participants think critically about their every day practices and their perceptions. Due to the extended and extensive time at the study site, I had the opportunity to engage in frequent dialogues with participants, always aiming to enhance and collect data for the study. Due to the data collection questions being posed, participants were required to think about and rationalize their actions and decisions regarding teaching and learning; therefore, sparking reflective thought on the part of participants. Therefore, teachers who participated within this study had the ability to collaborate as reflective practitioners. Students who participated could perceivably gain a sense of empowerment through questions and situations that valued their voice and perceptions. It was through this unanticipated role as a facilitator of reflective thought that participants potentially benefited professionally and/or personally throughout the study.

I endeavored to blend into the setting of the school as much as possible, to become a natural addition within the school setting. In order to accomplish this goal, careful attention was paid to the surroundings within the school environment noting reactions toward me, underlying norms, and the overall culture of the school. On multiple occasions, I was told that my presence within classrooms was non-threatening, and at times, unnoticeable by either the students and/or the teachers. Through this careful attention, my perception was that I was quickly able to assimilate to the setting.

## **Research Timeline**

Data collection for the study began Monday, February 11, 2008, and concluded the week of May 10, 2008. The first day on site, the researcher began acclimating and assimilating to the site, the teachers, the students, and the overall culture of the school. Therefore, I commenced collecting preliminary data through general observations within the corridors and common spaces within the school. As I met potential participants of the study, I explained the purpose of my presence, including a general overview of my research. Within the first week of data collection, I spoke with and distributed informed consent forms for individuals to complete who were invited to and interested in participating within the study. On Wednesday, February 13, 2008, there was a faculty meeting at which I introduced myself, and this research study officially, to the entire faculty, teachers and support staff. For students, I distributed informed consent forms for them to take home to be signed individually and by his/her parent(s)/guardian(s), in addition to mailing a copy home. Included within this mailing, I inserted an open-ended survey and informed consent form for parents to complete as well. The initial week on site was devoted mostly to developing a relationship with the teachers so that they felt comfortable with my presence, to establishing a presence within the school environment so that students became accustomed to my presence, and to collecting preliminary data to help focus my efforts for additional data collection. Within the first week of the study, I began receiving signed informed consent forms allowing me to enter classrooms the second week to collect observational data.

Throughout the study, as the researcher, I attempted to be as minimally intrusive as possible so that every day activities could be carried out unaffected by my presence. I became enough of a regular fixture within the school setting and classrooms to minimize the distraction

of my presence. During fieldwork, I typically remained onsite for 3 hours/ 3 class periods daily in order to collect observational data. Depending on additional events/activities scheduled for specific day, I sometimes remained onsite for briefer or longer periods. I logged approximately 85 hours of observational data collection in addition to substantive time spent conducting interviews. Table 3.6 highlights the research timeline I followed.

**Table 3.6 Research Timeline**

<b>Date</b>	<b>Duration in Field</b>	<b>Purpose of Visit/ Data Collected</b>
11-Feb	3 hours	Observe culture and climate of the school
12-Feb	3 hours	Observe culture and climate of the school
13-Feb	3 hours	Attend faculty meeting – Distribute consent forms for teachers and to teachers to send home with students
18-Feb	3 hours 4 hours	Observation in Language Arts, Spanish 1, and Spanish 2 classes Attend parent/teacher conferences @ 4:00 – 8:00
19-Feb	3 hours	Observation in Algebra 2, College Algebra, and Math Enrichment classes
20-Feb	2 hours	Observation in US Government classes
25-Feb	3 hours	Observation in Computer Applications, Document Processing, and Physics classes
26-Feb	7 hours	Observation in Language Arts and Spanish 2 classes Observation of Assembly on Bullying with Miss Kansas
27-Feb	2 hours	Observation in US Government, and US History classes
28-Feb	3 hours	Observation in Algebra 2, Chemistry, and Reading classes
29-Feb	3 hours	Observation in Computer Applications, Document Processing, and Reading classes
3-Mar	5 hours	Observation in Advanced Biology, Computer Applications, InHouse Design, Publications, and US Government classes
5-Mar	4 hours	Observation in World History Class, Science, Social Studies, and World History classes
11-Mar	3 hours	Observation in Health, College Algebra, and Social Studies classes
12-Mar	2 hours	Observation in Geometry class Attend faculty meeting
24-Mar	3 hours	Observation in Learning Academy, Resource Room
25-Mar	2 hours	Observation in Learning Academy
26-Mar	2 hours	Observation in Learning Academy, and Geometry class
27-Mar	4 hours	Observation in Chemistry, Language Arts and Learning Academy classes
8-Apr	3 hours	Observation in Language Arts classes
14-Apr	4 hours	Observation in Geometry, Resource Room, and US Government classes
15-Apr	2 hours	Observation in Language Arts and Entrepreneurship classes

21-Apr	3 hours	Observation in Earth Science, Language Arts, and Geometry classes
23-Apr	2 hours	Attend Administrative Meeting regarding Laptop initiative
28-Apr	2 hours	Observation in Language Arts and Earth Science classes
29-Apr	3 hours	Observation in Language Arts, Geometry, and Recourse Room classes
1-May	3 hours	Observation in Earth Science and Language Arts classes
<b>Total - - 85 hours</b> were documented, conducting observational data collection		

## Data Collection

This research intended to explore how rural, Cardinal Creek High School’s one-to-one laptop initiative was perceived to impact the content area literacy within content area classrooms; thus, exploring how content area literacy was being taught, how new literacies were being utilized, and how critical literacy was being fostered within participating content area classes was the study focus. Data collected in this study was multifaceted to gain a thorough understanding of the case being studied. Traditionally, within case study research, there are six sources for data collection: documents, archival records, physical artifacts, interviews, personal observation, and direct observation (Yin, 2003). With each collection source there are benefits and drawbacks that should be noted so that decisions and choices can be made wisely on the most applicable data collection methods by situation. Due to the limitations of each collection source, it is wise to triangulate data collection sources.

As presented in Table 3.7, sources for data collection within this study included (a) an open-ended qualitative survey, (b) classroom observation and field notes, (c) individual teacher interviews, (d) modified student focus group interviews, and (e) review of varied documents and artifacts. All participants (teachers, students, administrator, and parents) were asked to complete an open-ended survey that focused on their unique experiences and perceptions. Observations and field notes were collected within the school and within classrooms whose teachers granted their informed consent. Individual interviews were requested of particular

teachers and administrators. Not every participant was interviewed individually. Dependent upon data that were collected, I choose to explore some participant views, experiences, and perceptions in more depth. Focus group interviews were hosted for student participant groups. Documents and artifacts were also collected from the school and district administrators, teachers, and students. Documentation such as board meeting minutes and student assessment scores provided a richer context within which to frame the study. Artifacts from teachers and students (lesson plans, hand outs, and work samples) also allowed for a richer and more complete picture of the study.

**Table 3.7 Data Collection Source and Analysis**

<b>Research Question</b>	<b>Data Collection Source</b>	<b>Analysis</b>
<p><u>OVERARCHING QUESTION</u></p> <p><i>What is the perceived impact that the one-to-one laptop initiative has had on teacher's instruction to enhance student learning?</i></p>	<ul style="list-style-type: none"> <li>• Classroom observations</li> <li>• Field notes</li> <li>• Individual interviews</li> <li>• Tandem focus group interviews</li> <li>• Surveys of all participant groups</li> <li>• Documents and artifacts</li> </ul>	<p><i>Blending of direct interpretation and categorical aggregation</i></p>
<p><u>SUB-QUESTION</u></p> <p><i>How has the one-to-one laptop initiative's technology been utilized by participants?</i></p>	<ul style="list-style-type: none"> <li>• Classroom observations</li> <li>• Field notes</li> <li>• Individual interviews</li> <li>• Tandem focus group interviews</li> <li>• Surveys of all participant groups</li> <li>• Documents and artifacts</li> </ul>	<p><i>Blending of direct interpretation and categorical aggregation</i></p> <ul style="list-style-type: none"> <li>• Initial interpretations derived through direct interpretation</li> <li>• Emerged patterns and disaggregated subcategories derived through categorical aggregation</li> </ul>
<p><u>SUB-QUESTION</u></p> <p><i>How has content area literacy instruction been effected as a result of the one-to-one laptop initiative?</i></p>	<ul style="list-style-type: none"> <li>• Classroom observations</li> <li>• Field notes</li> <li>• Individual interviews</li> <li>• Tandem focus group interviews</li> </ul>	<p><i>Blending of direct interpretation and categorical aggregation</i></p>
<p><u>SUB-QUESTION</u></p> <p><i>What has been the role of the new literacies as a result of the implementation of the one-to-one laptop initiative?</i></p>	<ul style="list-style-type: none"> <li>• Classroom observations</li> <li>• Field notes</li> <li>• Tandem focus group interviews</li> <li>• Surveys of all participant groups</li> <li>• Documents and artifacts</li> </ul>	<p><i>Direct interpretation</i></p>
<p><u>SUB-QUESTION</u></p>	<ul style="list-style-type: none"> <li>• Classroom observations</li> </ul>	



<p><u>SUB-QUESTION</u></p> <p><i>What has been the role of critical literacies within classrooms with the one-to-one laptop initiative?</i></p>	<ul style="list-style-type: none"> <li>• <i>Field notes</i></li> <li>• <i>Individual interviews</i></li> </ul>	<p><i>Blending of direct interpretation and categorical aggregation</i></p>
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### ***One-to-One Laptop Initiative Survey***

Surveys allow for an additional form of data collection in which both factual and subjective data can be obtained (Mowbray & Yoshihama, 2001). Survey questions can either be open-ended or closed-response. Closed-response questions can sometimes lead to participants guessing about what they think the expected or “right” answer might be. By leaving questions open-ended, participants can respond freely, encouraging descriptive responses. Utilizing open-ended questions can be problematic, if participants find the questions ambiguous. Therefore, it is vital to focus careful attention to the wording of questions. Mowbray and Yoshihama (2001) caution that questions should avoid being emotionally “loaded,” but should maintain a balanced wording. For example, a question that asks, “Do you support the No Child Left Behind legislation?” would be unbalanced in it’s wording, whereas the question, “Do you support or oppose the No Child Left Behind legislation?” is balanced. Wording can affect how a participant responds to the question, reinforcing how important it is to carefully compose survey questions.

Based on these suggestions, I carefully attended to how I worded my survey questions maintaining balance, and encouraging thoughtful responses. I included some close-ended questions in order to gain a more complete contextual understanding of the respondent; however, most of the questions were open-ended and qualitative in nature. A form of the Cardinal Creek High School One-to-One Laptop Initiative Survey (Appendix F) was administered to all participant groups (teachers, students, administrators, and parents). Each form was tailored to the participant group for which it was intended. Respondents should have been able to complete surveys in approximately 20 minutes. I emailed surveys to teacher participants in addition to

placing a copy in their mailboxes, to be completed at their convenience, and in the format that was most facile. Paper surveys were provided to all other participant groups with the option of being emailed digital copies. All participants from the student, parent, and administrator participant groups choose to utilize the paper surveys. Completion of these surveys was one of the first data collection tools to be distributed and collected, in order to acquire a better understanding of etic issues participants presented, thus guiding my inquiry while collecting data from other sources.

### ***Observations and Field Notes***

The majority of time spent during the study was at Cardinal Creek High School within various content area classrooms observing and recording field notes. Approximately 85 hours of observation time was recorded during this study (Table 3.6). Observation data collection is beneficial due to all the rich contexts the researcher can note, and inferences that can be made from seeing how environmental factors influence the case (Bogdan & Biklen, 1998). However, when the researcher is conducting observations, s/he can miss events/activities, therefore creating the issues of reflexivity and selectivity (Yin, 2003). If the researcher is not observing on a regular basis, there can be an incomplete picture drawn of the case, thus selectivity. The presence of the researcher can also create the issue of reflexivity. The researcher's presence may cause the participants being observed to act differently than they normally would (Yin, 2003). As a result of being in the field for an extended time collecting data (Table 3.7), I aimed to minimize reflexivity, becoming a regular presence within the school building. However, Bogdan and Biklen (1998) recommend that the researcher should remain in the field, doing observations no longer than his or her memory allows in order to recall events clearly enough to finish field

notes afterward. Therefore, even though I was on site regularly, my visits typically lasted for three to four hours, allowing for accurate recall when completing reflective field notes.

Observational notes consisted of two different types - descriptive and reflective. Descriptive field notes, “represent the researcher’s best effort to objectively record the details of what has occurred in the field. The goal is to capture the slice of life,” (Bogdan & Biklen, 1998, p. 121). When recording descriptive notes, it was better to record events as documentation of specific evidence rather than summarizing or making evaluative comments. For instance recording an observation as “the student was bored” is evaluative, rather describing what the student was doing to make the researcher think s/he was bored is what should be recorded such as, “the student had her book pushed to the top of her desk, with her head laid down and fiddling with her necklace.” Descriptive notes tend to be quite lengthy, striving to capture as much as possible and as accurately as possible. Typically, descriptive field notes include the following areas: (a) portraits of the subjects, (b) reconstruction of dialogue, (c) description of the physical setting, (d) accounts of particular events, (e) depiction of activities, and (f) observer’s behavior (the researcher is after all part of the setting being observed) (Bogdan & Biklen, 1998).

Reflective field notes allow the researcher to account for more of the subjectivity of the observations and experiences. Emphasis in reflective notes is on speculation, feelings, problems, ideas, hunches, impressions, and prejudices. These notes tend to reflect on material concerning analysis, method, ethical dilemmas or conflicts, observer’s frame of mind, and points of clarification (Bogdan & Biklen, 1998).

Due to the technology within the school and the uniqueness of the case being studied - the one-to-one laptop initiative - I choose to record my field notes from observations and reflections on my laptop, not anticipating reflexivity being an issue within this circumstance.

Sitting among students, typically in the back of the classroom, I blended into most of the classroom environments when taking notes on my personal laptop. During the observations I focused on collecting descriptive field notes. I attended to different situations, when relevant and pertinent, I also recorded reflective field notes during the observation. Upon leaving the field (the school and/or classroom) I took time to complete my field notes, recording reflective notes I was not able to document during the observation, along with any lingering questions or concerns resulting from the data collected that day. See Appendix G for an example of field notes taken during classroom observations.

When entering the school and classrooms to conduct observations and collect field notes, it was necessary to have a protocol about what was to be observed, where the attention of the researcher would focus, and possibly how the researcher would collect the data for the observations. During the first two weeks of observations and field notes, my focus was to begin recording how the laptop technology was being utilized by both teacher and student participant groups, within both the environments of the school and individual classrooms. My observations took a wide lens (using both descriptive and reflective strategies) and my notes attempted to capture what was going on within the classroom to generate how the one-to-one laptop technology was being utilized; hence, what impact it was having on teacher instruction and instruction to enhance student learning. Once I began to acclimate to the school and classroom and had a better understanding of how the one-to-one laptop technology was being generally utilized by participants, I focused more of my attention on the perceived impact the technology was having on content area literacy instruction, and the connection between technology, the new literacies, and critical literacies.

As the study progressed, the focus of my observational visits within classrooms adjusted depending upon the juxtaposition between the lesson/ learning and the focus of the study. Review of my field notes served as an integrally important part in determining and guiding decisions regarding the focus of these observational visits. Participants' perceptions of the perceived impact the one-to-one laptop initiative's technology has had upon teacher instruction to enhance student learning was critically attended to throughout all stages of the data collection. Therefore, my purpose in observing and collecting data was continually refined as I attained clearer understandings and gained deeper insights. My field notes played a substantial role in guiding my data collection for future observational visits and interviews, serving as a reflective guide. Research areas and topics which needed more data, closer consideration, or further attention were guided by reading, reviewing, and analyzing the data I collected through the field notes.

### ***Teacher/Administrator Interviews***

Morgan (1988) refers to an interview as a purposeful conversation; it is through this lens that I planed to approach the individual interviews as well as focus group interviews. When utilizing interviewing as a source for data collection, the concern of reflexivity also arises in which the interviewee says what s/he thinks the interviewer wants to hear. The researcher should also be careful with regard to how s/he phrases questions so that bias can be avoided. However, with interviews, discussion can be directed toward the topic of the study, and the researcher can gain insights into the case through nonverbal communications and probing and clarifying questions.

“The interview is used to gather descriptive data in the subjects' own words so that the researcher can develop insights on how subjects interpret some piece of the world” (Bogdan &

Biklen, 1998, p. 94). Effective interviews are ones in which the interviewee is at ease and talks willingly and freely about his or her point of view, thus generating rich, thick data shedding light on the interviewee's perspectives.

Creswell (1998) suggests designing an interview protocol to guide the researcher during the interview. Within this protocol there should be a limit of approximately five questions; however, clarification and prompting questions are important to include in case the interviewee has trouble getting started. These prompting and clarifying questions also relayed to the interviewee that, as a researcher, there is a genuine interest in what is being said. Nodding and remaining attentive helped create a sense of ease during the interview.

To lessen the pressure of the interviewer/researcher in remembering all that was being said while gathering thoughts about how to lead into the next question, and maintain the ease of this "purposeful conversation", audio recording interviews proved helpful. Yin (2003) supports their use because they tend to provide a more accurate portrayal of the interview. However, he warns that recording devices should not be used if the interviewee feels uncomfortable with it or refuses permission, if it creates a distraction, or if the interviewer uses it as a substitute for listening closely and attentively.

When conducting interviews it was necessary that the researcher be prepared and patient. "Interviewers have to be detectives, fitting bits and pieces of conversation, personal histories, and experiences together in order to develop an understanding of the subject's perspective" (Bogdan & Biklen, 1998, p. 101).

I conducted formal structured individual interviews with teachers and administrators after I had begun collecting data through observations in order to guide my line of questioning. Interviews were digitally audio recorded and lasted approximately 20 minutes and no longer than

30 minutes in order to be respectful of a participant’s time. When necessary, follow-up interviews were conducted to address additional questions that surfaced from other data collection sources.

### ***Student Group Interviews***

Originating in market research, focus group interviews bring together a group of people to talk about a topic of interest (Morgan, 1988). Focus groups are often an effective way to gain insights about a topic which to pursue further during individual interviews. It is with this mindset, that I structured this study’s focus group interviews. Table 3.8 outline projected topics of discussion for each of the focus group interviews. One of the benefits of conducting focus group interviews was the “loosening effect” it tends to elicit (Vaughn, Schumm, & Sinaub, 1996). With the researcher’s role more passive, participants tended to open up more and disclose more freely. However, when participants were in a focus group not everyone must answer every question, therefore, responses tended to be more genuine and substantial (Lederman, 1990).

**Table 3.8 Topics and Focus Group Interview Format with Students**

<b>Date</b>	<b>Participant</b>	<b>Format</b>	<b>Discussion Topic</b>
Wed. 2/27/08	Seniors	Large Group Probing Interview	Initial perceptions on the one-to-one laptop initiative
Wed. 4/9/08	Seniors	Tandem Focus Group Interview	New literacies and content area literacy
Wed. 4/23/08	9 <sup>th</sup> -11 <sup>th</sup> graders	Focus Group Interview	Initial perceptions on the one-to-one laptop initiative
Wed. 5/14/08	9 <sup>th</sup> -11 <sup>th</sup> graders	Tandem Focus Group Interview	New literacies and content area literacy

Since the focus group interviews had adolescent students as participants, additional care needed to be taken when moderating these interviews. Since adolescents often lack control over their environment, they can be hesitant to truly voice their opinions. Adolescents can find

themselves in situations in which an adult asks for their feedback to only react in an unfavorable way. Therefore, the power dynamic of a focus group where the adult (the researcher) is playing a more passive role, can take a moment of adjustment for the participant (Krueger & Casey, 2000). It is for this reason that the moderator, the researcher, needs to remain highly attentive throughout the focus group interview, “reading” the participants, and encouraging them to talk and share their views. Krueger and Casey (2000) also caution to group students within approximately a two-year age span due to fact that peer pressure can influence comments.

Based on these guidelines and within this mindset, I planned initial focus group interviews with 12<sup>th</sup> grade students, and 9<sup>th</sup>, 10<sup>th</sup>, and 11<sup>th</sup> grade students separately. As long as the students fell within the correct grade bracket and turned in their completed informed consent forms, they were invited and welcomed to attend the initial focus group interview. There was such an outpouring of participation within the 12<sup>th</sup> grade student group during the initial focus group interview. Due to the size of the group for this interview, this was classified as a large group probing interview in order to determine topics and concepts that required further investigation or to gain insights regarding questions that needed to be addressed. I was able to structure a more traditional follow-up focus group interview for the 9<sup>th</sup>, 10<sup>th</sup>, and 11<sup>th</sup> grade student group, but I was forced to reconsider how I would structure the follow-up focus group for the 12<sup>th</sup> grade student group in order to extract quality information, and at the same time not limit my data collection potentials. Due to the nature and size of Cardinal Creek High School, I perceived that students’ might be disappointed, or potentially undervalued if they were not asked back to participate within a follow-up focus group. Therefore, I decided to carefully structure a “tandem” focus group interview for my follow-up focus group interview with the 12<sup>th</sup> grade student group.



The tandem focus group interview was based upon the traditional premise and auspices of focus group interviews. However, there were multiple focus group interviews running at the same time. As the researcher, I created an interview protocol for these tandem focus groups (Appendix H) to assist and guide students within their discussion groups. In addition, I placed students into discussion group/focus group groups so that their discussions would be as rich and substantive as possible. Within each of the tandem focus group sessions, there was one group that was created based upon the diversity of responses and their insightful views from the initial focus group interview. It is with this generated subgroup that I joined in the discussion as the researcher. I did not necessarily lead this discussion. I allowed the students to act as all the other created subgroups, but as the discussion was shaped, I was present to interject clarification questions or follow-up questions based upon what was being said. Therefore, it was as if this one subgroup was facilitated as a traditional focus group, but, there were multiple focus group discussions going on simultaneously. Upon termination of the tandem focus group discussions, participants were asked to summarize the key points of the discussion and to include any final comment(s) they wished to share. This allowed for me as the researcher to gain clarity in individuals' perceptions of their individual focus group discussions, while also serving as a backup in case the audio recording device malfunctioned and did not record.

All focus group interviews were digitally, audio recorded to ensure accuracy when transcribing discussions. During the tandem focus group interview, each subgroup was provided an audio recording device to document their unique discussion. All focus groups were conducted within approximately 20-25 minutes during the student lunch period. Attendance for focus group interviews was advertised by posting flyers throughout Cardinal Creek High School (within the common room, at the front office, and on the door into the cafeteria) announcing the

time, place, and purpose. The week of the focus group interviews, a brief statement was included on the daily announcements, reminding and alerting participants of the opportunity to participate within this focus group.

### ***Documents and Artifacts***

When collecting documents, archival records, or physical artifacts, limitations arise from difficulty accessing these sources. Bias may be created by having only partial access granted to certain documentation; thus, leaving the researcher with an incomplete picture. Conversely, with these data sources, a researcher is able to review the data repeatedly.

To gain a broader and deeper understanding for the context of this study, I used documents and other artifacts to support my data collection. Some data collected through documentation and artifacts provided information unattainable or more easily attainable than through other data collection sources. However, documentation and artifacts that were gathered reinforced evidence collected via other data collection sources.

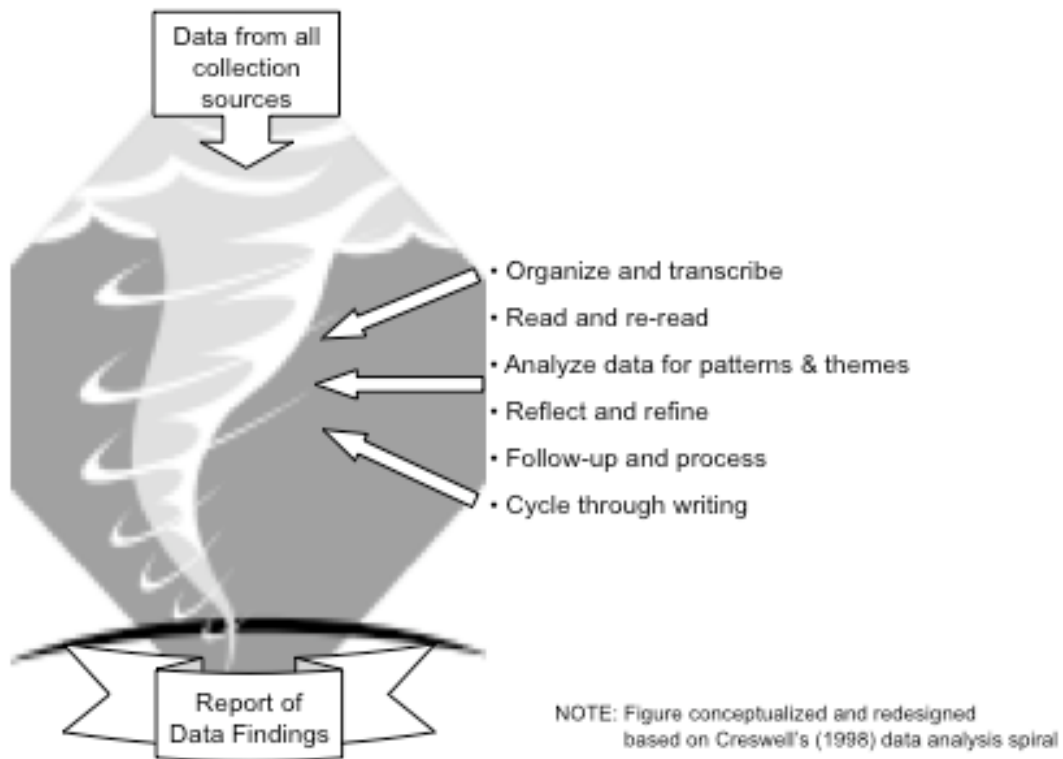
I reviewed, duplicated, and collected documentation from the district and high school in regards to the history and impact of the one-to-one laptop initiative including school board meeting notes and student test scores. From individual teachers and students, I collected artifacts such as lesson plans, handouts, and work samples. Through these materials, I achieved a richer and more complete picture of the case study.

### **Data Analysis**

Data analysis can be like putting together a puzzle that does not have a picture to reference on the box. With each new piece of data collected, the researcher has another piece of the puzzle that clarifies the picture that is being created. Case study research does not require

having all data collected before beginning the analysis. As illustrated in Table 3.7, data collection and analysis will occur simultaneously during the study, maintaining ongoing direct interpretations and categorical aggregation. The analysis cycle that will continually spiral throughout the study is more comprehensively illustrated in Figure 3.2. Interpretations of data will constantly move through this funnel to: (a) organize and transcribe, (b) read and re-read, (c) analyze data for patterns and themes, (d) reflect and refine, (e) follow-up and process, and (f) cycle through writing.

**Figure 3.2 Analysis Cycle**



At the onset of data collection, and maintained throughout the analysis process, I kept data organized by data format and sources within multiple file folders on my computer. Hard copies of data were kept in accordion-style divided folders, mirroring the filing system on my computer. This allowed for the accurate and timely retrieval of information and data during

analysis. All individual and focus group interviews were digitally recorded and stored on my computer as both audio files and transcribed word documents. As I read and re-read transcripts and field notes from observations, I began designating emerging categories, patterns, and themes. Sifting and sorting data into these different themes assisted in maintaining organization throughout the process.

Stake (1995) supports two tactical ways in which case study research can be interpreted and analyzed, direct interpretation and categorical aggregation. Within direct interpretation, individual and specific occurrences or instances are candidly and straightforwardly interpreted and analyzed. Categorical aggregation transpires when data through these individual occurrences are collected until enough of these specific occurrences can be combined to reach new or more elevated meaning. Through a combination of directly interpreting data that I collected, and categorically aggregating data until greater understanding was achieved, I analyzed the data for this case study. “The qualitative researcher concentrates on the instance, trying to pull it apart and put it back together again more meaningfully – analysis and synthesis in direct interpretation” (Stake, 1995, p. 75).

Through direct interpretation I was able to derive some of my initial data findings. Table 3.9 illustrates the color-coding strategy utilized to classify the data into initial categories.

**Table 3.9 Color Codes of Initial Categories**

	Utilization of the laptops by teacher participants
	Utilization of the laptops by student participants
	Content area literacy
	New literacies
	Critical literacy
	Overall perceptions

The more time I remained on site collecting data, the better I was able to combine some of my initial findings and verify through categorical aggregation that these interpretations were accurate. Through data analysis via categorical aggregation, emic issues would arise that I would then attend to when conducting and collecting further research. Therefore, within the analysis cycle, there was constant cooperation between direct interpretation and categorical aggregation in order to confirm, support, and guide continued data collection and analysis.

### *Utilization of Laptop Technology Data Analysis*

Data analysis within this subsection sought to answer the research question addressing how teacher and student participants' utilized the one-to-one laptop initiative's technology. Data collection sources employed to support the analysis of this content included:

- Student, teacher, administrator, and parent surveys,
- Classroom observations,
- Individual teacher interviews, and
- Group student interviews.

Through a blending of direct interpretation along with categorical aggregation, data for this section were analyzed. Initial categories of classification for how both teacher and student participants were utilizing the laptop technology was derived through the direct interpretation of data from surveys, comments made during interviews, and instances directly viewed within classroom observations. Through categorical aggregation, patterns emerged regarding the purpose for, and the intent behind, the various activities in which student participants utilized the technology. These coding categories derived from categorical aggregation included student utilization of technology based upon:

- Academic purposes,

- Recreational purposes, and
- Facilitation of personal efficiency.

Drawing upon the research of Warschauer and Grimes (2005), I further categorized and analyzed the data based upon the purpose for why students conducted academic research via:

- Finding information for projects/ assignments,
- Facilitating “just in time” learning, and
- Stimulating schema and background knowledge about curricular content.

Appendix I contains examples of data analysis from each of the four sources listed within this subsection.

Classifications for how technology was utilized during instructional time emerged from the direct interpretation of data. Then, through the categorical aggregation of this data, the subcategories emerged, allowing for any disaggregation of the original categories. Overall, the data within this section was directly interpreted, reflecting the pedagogical focus of instructional time spent within the classrooms.

### ***Content Area Literacy Data Analysis***

Data analysis within this section sought to respond to the research question addressing how content area literacy instruction had been effected as a result of the one-to-one laptop initiative. Data sources utilized to support this analysis included:

- Classroom observations;
- Individual teacher interviews; and
- Group student interviews.

Data within this subsection was analyzed through a combination of direct interpretation and categorical aggregation of data relevant to content area literacy.

Data from the digital science textbook was analyzed through direct interpretation and categorical aggregation via the three data collection sources. Through these blended, combined interpretations, general categories and patterns emerged pairing content area literacy within the parameters of the digital textbook. These categories included:

- Searching tools/ strategies utilized within digital texts, and
- Realizing the connection (or lack thereof) between the text and the reader.

Appendix J contains direct interpretation and categorical aggregation of data from the three sources listed within this subsection.

Content area literacy instruction data in this study were derived predominantly through classroom observations, and data was analyzed through a blending of direct interpretation and categorical aggregation. Categories for data analysis were adapted from a couple of the elements Vacca and Vacca (2002) have for content area literacy:

- Vocabulary development, and
- Comprehension strategies.

As data sources were collected and analyzed through direct interpretation, data were appropriately categorized. Further categorical aggregation denoted specifically what comprehension strategies were utilized, whether through:

- Content/ concept comprehension, or
- Reading comprehension.

Thus, through a blending of direct interpretation and categorical aggregation, data regarding content area literacy instruction was analyzed.

### *The New Literacies Data Analysis*

The data analysis within this section responded to the research question focusing on the role of the new literacies as a result of the implementation of the one-to-one laptop initiative.

Data that were analyzed resulted from:

- Student and teacher surveys, and
- Extended classroom observations.

Analysis was conducted predominantly via direct interpretation.

When analyzing the data for how the new literacies skills were being fostered within an instructional setting, categories were derived from the skills perceived necessary to successfully, effectively, and efficiently utilize the new literacies (Leu, Kinzer, Coiro, & Cammack, 2000).

These skills included:

- Identifying questions,
- Locating information,
- Critically evaluating the usefulness of information,
- Synthesizing information to answer questions, and
- Communicating answers to others.

Collected data was subsequently analyzed and categorized within the appropriate classifications.

Overall, each content area classroom was observed and data from the observations regarding the new literacies were directly interpreted and presented within the findings. Appendix K contains direct interpretation of the two data sources listed within this subsection.



### *Critical Literacy Data Analysis*

Within this section data analysis responds to the research question addressing the role of critical literacy within the classrooms with the one-to-one laptop initiative. Data sources utilized within this analysis include:

- Extensive classroom observations, and
- Individual teacher interviews.

Through these sources, data were analyzed employing a blending of direct interpretation and categorical aggregation. Data concerning teacher's perceptions regarding the role of critical literacy as it relates to laptop technology utilization were analyzed through direct interpretations of comments from individual teacher interviews. Then, through categorical aggregation, and based upon the foundational concepts of critical literacy (Dozier, Johnston, & Rogers, 2006) data that were collected were analyzed within these foundational concepts:

- Students' sense of agency, and
- The power dynamic portrayed within the classroom environment.

Appendix L contains direct interpretation and categorical aggregation of data from both of the data sources within this subsection.

Throughout the data analysis cycle and spiral, I continually revisited questions, concerns, and lingering data points that I struggled to classify, by continuing to observe, collect field notes, and, when necessary and appropriate, elicit follow-up interviews. As a result of constantly reviewing and revisiting my interpretations of collected data and newly acquired data, I generated a more thorough understanding of the study.

The objective of this study was to gain a richer and deeper understanding regarding the perceived impact this laptop initiative had on individual teacher's content area instruction, the role of the new literacies, critical literacy, and teacher's instruction to enhance student learning. Through categorical aggregation and direct interpretation of case study research analysis, participants' perspectives were captured reflecting a verisimilitude for the study and the perceived impact the one-to-one laptop initiative has had on teaching and teacher's instruction to enhance student learning.

### **Establishment of Trustworthiness**

The traditional criteria that appeased the canons of reliability and validity tend not to align well with qualitative research. Lincoln and Guba (1985) use alternative terms adhering more to the qualitative/naturalistic paradigm such as trustworthiness, credibility, and transferability. The essence, however, is the same; a well-conducted study needs to establish its credibility. Prior to collecting data within the school, an application for Human Subject Exemption approval from the IRB of the Office of Research Compliance of Kansas State University (Appendix B) was submitted and approved. In addition to permission to collect research at this site was granted, I sought informed consent from all who participated (teachers, students, administrators, and parents) within the study. For student participants I sought informed consent from both the individual student and his or her parent(s)/guardian(s) if the student was under 18 years of age (see Appendix D). All who participated were assured of privacy and confidentiality through the use of pseudonyms and secured storage of data.

Techniques that are employed within this study to establish trustworthiness include (a) prolonged engagement and persistent observation, (b) crystallization, and (c) member checking.

### ***Prolonged Engagement and Persistent Observation***

In order for the researcher to build trust with participants, learn the technological culture, and confirm what data was relevant to the study, I worked within the setting of the study for extended periods of time (Lincoln & Guba, 1985). Table 3.6 illustrates my commitment as a researcher to dedicating considerable time in the field collecting data. I was on site collecting data through observations for roughly 85 hours, conducted individual interviews for an additional 10 hours, spent another 2 hours of time moderating focus group interviews, and utilized 10 hours attending various meetings. Therefore, there were over 100 hours spent researching and collecting data for the duration of this study. Through this in depth engagement in the field, I aimed to increase the credibility of the data I collected.

### ***Crystallization***

Prominent qualitative researchers promote triangulation as one way to establish the trustworthiness of a research study (Yin, 2003; Stake, 1995; Creswell, 1998). Yin (2003) describes the concept of triangulation as using multiple sources of evidence in order to develop “converging lines of inquiry” (p. 98). Therefore, a study is much more likely to be convincing and accepted as credible if there are multiple sources of data to support the inferences that are drawn. However, triangulation assumes that there is one point, a superior explanation, in which all other arguments should center around and approach (Barbour, 2001). For the qualitative researcher, multiple points of view and, thus, multiple truths are acknowledged.

It is with this in mind that Richardson (2000) offers “crystallization” as an alternative to triangulation. “What we see depends upon our angle or repose” (Richardson, 2000, p. 934). Therefore, during the crystallization process, the researcher is able to tell the same story from different perspectives and multiple vantage points. Within this study, I strived for crystallization

by collecting data from multiple participants with multiple viewpoints. The variety of data sources and viewpoints contributed to a more complete picture and thorough analysis of the data. Table 3.7 illustrates the multiple ways in which I collected data.

### *Member Checking*

There is no more credible way to ensure the trustworthiness of the research than to have participants review the findings and interpretations being made by the researcher. Creswell (1998) encourages member checking, asking participants within the study to share their views on interpretations being made by the researcher to validate that the analysis is on target. Throughout the study, I conducted member checks with the participants from the student, teacher, and administrator participant groups (Appendix M). Of these participant groups, member checks were elicited from 5 students, 8 teachers, and 2 administrators. The feedback and data I received supported and solidified my interpretations and analysis, thus encouraging me to maintain and sustain the path of my data collection and analysis.

More informal member checking was solicited with an even larger participant population during earlier stages of data analysis through informal conversations with different participant groups regarding initial interpretations and preliminary patterns that began to surface. Additionally, after I wrote my report for the Cardinal Creek High School based upon the foundations of this study, I shared my current analysis, findings, and interpretations with the building principal, the district superintendent, and the high school staff as a whole. This opportunity provided another measure of member checking at a later stage of the data analysis. Feedback and comments were welcomed throughout the research study to provide additional information to apply and guide the data analysis process.

## Summary

The purpose of this proposed research was to explore how the one-to-one laptop initiative of a rural high school has been infused into content area classrooms thus exploring how content area literacy was being taught, how new literacies were being utilized, and how critical literacy was being fostered within participating content area classes. In this chapter I have outlined and detailed the methods I employed in order to conduct this study. Based in a qualitative tradition of inquiry, I used case study methods to frame my study and analyze data.

New technologies shape new literacies and new literacies mold the very way societies communicate. Educators, too, must adapt to encourage relevant and necessary learning for students to become fully literate within the 21<sup>st</sup> century. Through the thoughtfulness and reflection regarding new technology initiatives, including laptop one-to-one school programs, educators will acquire a greater understanding of changes required to advance the education process and empower student learning. The intent of this study was to help facilitate this effort.

## **CHAPTER 4 - Findings**

The data collected for this study explore how the one-to-one laptop initiative in a rural high school has been infused into content area classrooms. Discovering how content area literacy is being taught, how new literacies are being utilized, and how critical literacy is being fostered within participating content area classes are presented within this chapter. Data from individual interviews, tandem focus group interviews, surveys, observations, and artifacts and documentation have been compiled and their results create the substance for Chapter Four. Data findings are divided by the research questions being addressed: (a) the one-to-one laptop initiative's technology utilization by participants, (b) the one-to-one laptop initiative's effect upon content area literacy, (c) the role of new literacies within the one-to-one laptop initiative, (d) the role of critical literacy within the one-to-one laptop initiative, and (e) the perceived overall impact of the one-to-one laptop initiative.

### **One-to-One Laptop Initiative's Technology Utilization**

Self-reported participant data, in addition to data collected via observation for both student and teacher populations, were recorded regarding utilizing the one-to-one laptop technology for various activities and tasks. Data findings presented support that the one-to-one laptop technology was being utilized for a variety of purposes and with an array of skill levels. In order to clearly express and elaborate upon the data, this section is subdivided by (a) student's utilization of technology, (b) teacher's utilization of technology, and (c) pedagogical implementation with technology utilization.

### *Student Utilization of Technology*

Looking down the hallways of Cardinal Creek High School before the start of school, students occupy the vast majority of the space available within the narrow corridors. Many congregate around a handful of lockers, sitting on the tile in groups. Most of these student groups casually converse with bursts of intermittent laughter. On their laps sit open iBooks, Macintosh laptops issued in affiliation with the one-to-one laptop initiative at Cardinal Creek High School. Some of these iBooks are playing music, running games, checking email, accessing the Internet, and completing homework. Yet there are some computers that have all of these applications operating simultaneously. The school bell rings signaling that students have 3 minutes to get to their first hour classroom before being counted tardy. Students, who just moments ago filled the hallways casually loitering, talking, and working, now began to move with more purpose, packing up their supplies and walking to their respective classrooms. There are a few, however, who are just now arriving to school, directly going to their first class. One of these students arrives with only his laptop in hand. Laptops . . . Have they become the new “bring your pencil to class”? The principal answers, “That’s right.”

Students were documented as utilizing laptop technology frequently and for multiple purposes. When attending most courses, it was expected that students arrive with their iBooks. If all other supplies were forgotten for that lesson that day, the laptop was generally the item that students either remembered and/or brought to class. In the 1980’s at Cardinal Creek High School, the minimum students might bring to class, in order to be prepared, would be their pencil and paper. At Cardinal Creek High School today, the supply that students bring to class to be minimally prepared is their laptop.

Table 4.1 classifies how students are utilizing the laptop technology by distinguishing the purpose and intent of the activity.

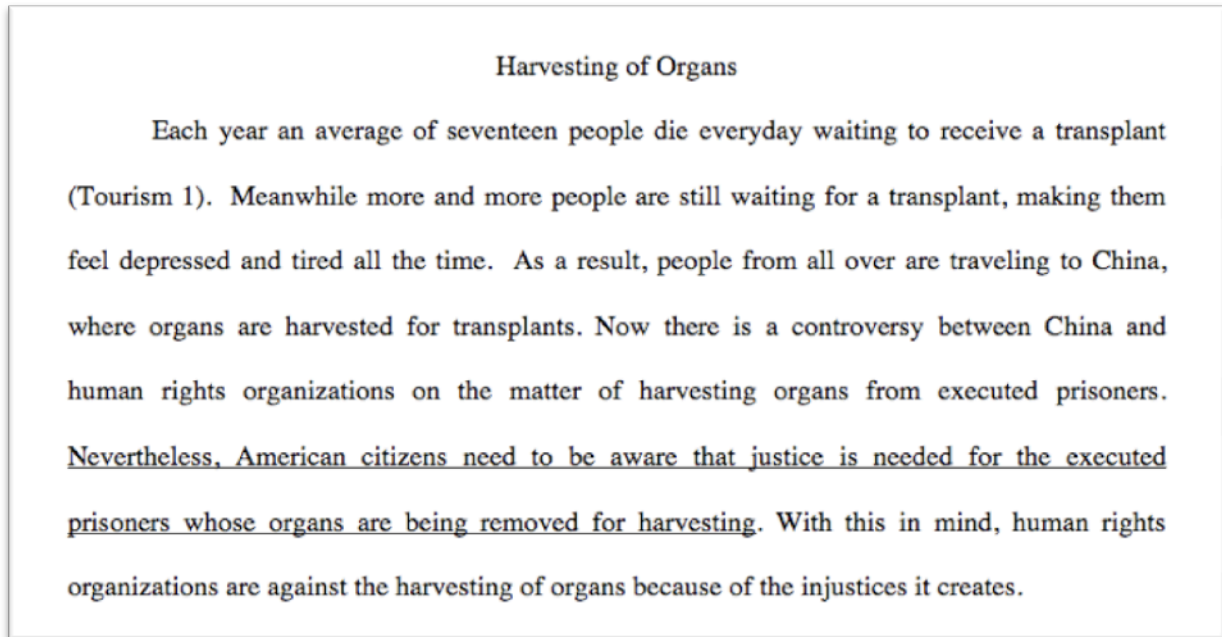
**Table 4.1 Student Laptop Usage Categories**

<b>Student Laptop Usage by Category</b>		
<b><u>Academic Purposes</u></b>	<b><u>Recreational Purposes</u></b>	<b><u>Personal Efficiency</u></b>
Taking notes	Surfing the Internet	Checking grades
Creating PowerPoints	Playing games	E-mailing
Writing reports/papers	Listening to music	Organizing personal affairs
Generating “creative” projects	Downloading & editing pictures	
Conducting research	Watching videos	
Completing assignments & homework		

*Academic purposes* denote activities and tasks undertaken by students that align with the lesson being taught. These are activities that through participation and completion, teachers consider to be demonstrating on-task behaviors. Tasks classified under academic purposes include taking notes, creating PowerPoints, writing reports/papers, generating “creative” projects, conducting research, and completing assignments and homework. An example of what one student classified as a “creative” project, was an assignment completed within Ms. Parker’s music appreciation class in which students created a multimedia presentation. Students spent several weeks composing an original score for a unique movie trailer they created. Upon composing and recording their musical score, students edited it within GarageBand, part of the iLife suite for Macintosh computers. Students then were to write a short description for the movie scene and/or trailer, in which they composed the musical score. Word processing documents were other frequently employed activities that students used to complete assignments. Image 4.1 illustrates the formatting and general word processing skills that one student utilized to write a language arts paper.



#### Image 4.1 Student's Language Arts Paper



This student sample highlights the ability for students to perform basic formatting and utilize general toolbar functions.

Another of the major classifications for how laptop technology is utilized is that of *recreational purposes*. Activities that are categorized as recreational include ones that students embark upon for enjoyment, fun, and/or leisure. Teachers typically consider students, who during class periods participate within these activities classified as recreational, to be demonstrating off-task behavior. Tasks categorized under recreational purposes include surfing the Internet, playing games, listening to music, downloading/editing pictures, and watching videos.

The other category for student laptop usage is that of activities and tasks that support *personal efficiency*. These tasks are classified as ones that support personal organization and efficiency. These activities include student laptop utilization to check the status of their grades, tasks associated with email, and activities needed to maintain personal organization like iCal

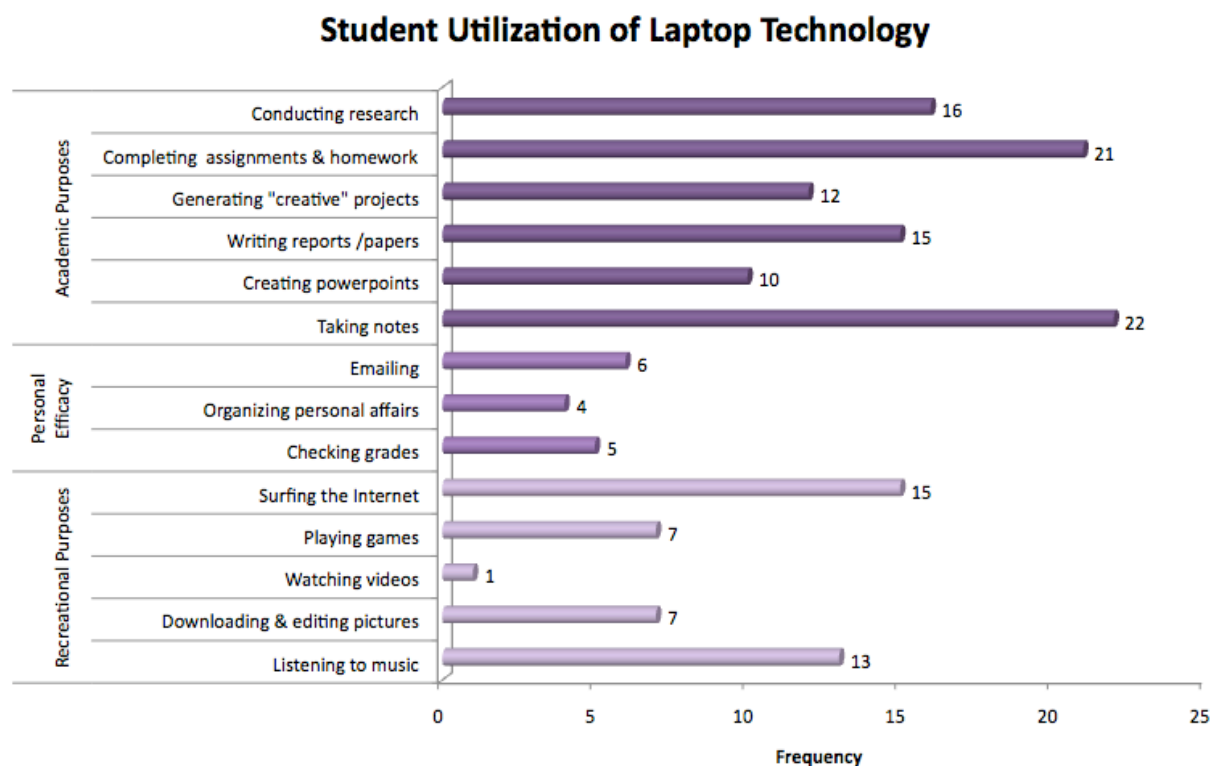
(electronic scheduling software) and digital task alerts. Some students would create and maintain elaborate organizational schemes within iCal. One student color-coded her tasks, projects, and assignments, allowing for efficient recognition of upcoming events and obligations; daily, weekly, and monthly views of her iCal entries resembled a rainbow. Personal efficacy tasks were often open windows on individual computers, simultaneously with windows associated with academic purposes, to allow for ease in toggling between active computer screens and programs. One senior participant stated, “It’s kind of like time management, doing something you need to do with something you have to do.”

Many students would toggle between open screens, maintaining multiple open applications, and depending on the focus of the student at any specific moment, would align to which window was active. Many students expressed they automatically opened certain applications immediately after turning on their laptops every day. The two most common applications to remain open all day according to students were e-mail and iTunes (a digital music repository).

Students who were surveyed, observed, and interviewed within this study were reported to utilize the one-to-one laptop technology for a variety of purposes. Almost without exception student laptop usage was documented during each class period observation. Figure 4.1 illustrates the frequency of how student participants employed laptop technology, and accounts for activities that are both academic in nature and those that are recreationally inclined. However, taking notes and completing assignments and homework were documented as occurring much more frequently than recreational tasks like playing games. Data for Figure 4.1 were derived from surveys completed by all four participant groups and group interviews with students. These

findings were further validated through classroom observations and field notes. Tallies recorded the frequency by which students utilized laptop technology.

**Figure 4.1 Student Usage of Laptop Technology**



Although not recorded as being utilized the most, there was high utilization of laptops by students for conducting research, followed by a singular frequency when writing reports or papers and surfing the Internet. Listening to music was another frequent practice. Generating “creative” projects and constructing PowerPoints straddle the median frequency with the creation of “creative” projects ranking just slightly higher. Laptops were employed considerably less frequently for downloading/editing pictures and playing games, followed closely by tasks affiliated with emailing. Students’ use of laptops to check their grades and maintaining personal organization were in the bottom quartile regarding frequency of use. Watching videos ranked

lowest in frequency when considering the list of activities and tasks that students employed their laptops.

Within Figure 4.1, surfing the Internet and conducting research are divided into separate categories. Student participants perceive their activities on the Internet as separate and depend upon the objective of the task. When teachers give students a task to complete that requires the usage of the Internet, students refer to their activities on the laptop as research or searching for information. Conversely, when students search the Internet for information that is self-directed, and with a focus that is not necessarily academically inclined, student participants refer to these activities as surfing the Internet. This terminology, surfing the Internet, holds a connotation that implies less purposeful actions, and more casual intentions, thus making the distinction between academic and recreational purpose.

Table 4.1 and Figure 4.1 assist in visually representing and explaining the varied ways in which students are utilizing laptops. It is clear that although the school issued the iBook laptops, students have employed the laptop technology for usage in addition to only academic purposes. Students value this tool, at least to some extent; otherwise, they would not use it as frequently as they do and for as many varied purposes. The laptops have perceivably impacted many, if not all, areas of daily activities for students because of their utilization within their personal life, academic life, and within the realm of recreation and leisure.

Students utilize the laptop technology of the one-to-one laptop initiative for a variety of purposes that stem from various intentions. Laptop utilization is not limited to student participants; teachers, too, utilize laptop technology and foster student usage of the laptops.

## Teacher Utilization of Technology

Welcome to Ms. Apple's math classroom. Extension cords and power strips extend from the wall outlet to the conglomeration of electrical cords accumulated around a central cart, housing an IKEE projector, iBook laptop, overhead projector, and a Texas Instruments (TI) projection graphing calculator. An Ethernet cable stretches halfway across the room between the Ethernet port behind the teacher desk and the iBook stationed on the centralized cart. It is lunchtime and the classroom teacher is animated while working with a small group of students, answering questions about a homework assignment. A mathematical YouTube video, *My Trig*, is playing, projected onto the whiteboard. Image 4.2 is a screen shot taken from the mathematical music video titled *My Trig*.

**Image 4.2 Screen Shot of My Trig Mathematical Music Video from YouTube**

The screenshot displays a YouTube video player for the video "My Trig" by the channel "IanKenn". The video content shows a hand writing the following derivatives on a whiteboard:

$$\begin{aligned} \frac{d}{dx} \sin x &= \cos x \\ \frac{d}{dx} \cos x &= -\sin x \\ \frac{d}{dx} \sec x &= \sec x \tan x \\ \frac{d}{dx} \tan x &= \sec^2 x \\ \frac{d}{dx} \csc x &= -\csc x \cot x \\ \frac{d}{dx} \cot x &= -\csc^2 x \end{aligned}$$

The video player interface includes a progress bar at 0:55 / 5:04, a rating of 5 stars, and 8,172 views. The right sidebar shows the video title "My Trig", the channel "IanKenn", and a list of related videos including "Trigonometry Rap", "Mathematicious", "WildTrig1: Why Trig is Hard", and "Numa Numa Calculus".

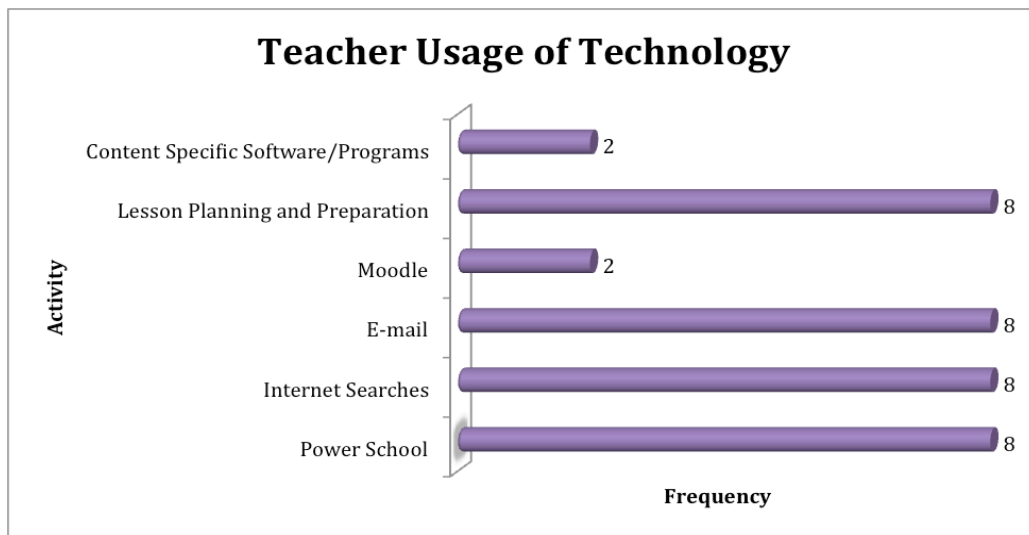
This mathematical music video is related and relevant to the content on which the teacher and small group are working; however, their focus and attention, though at one point could have been on this projection, is now background music and has blended into the classroom atmosphere.

Instead, the teacher and students alike are intent on the question and content as it specifically relates to the assignment that is being addressed.

As the next period begins, Ms. Apple purposefully and diligently readjusts this technology cart and its ancillary cords to position the overhead projector so that it can display the TI projection graphing calculator onto the whiteboard, all the while talking to students about last night's homework and expectations for the day's lesson. Ms. Apple in an interview states, "I have cords running around, and having to hook up this and this and that takes time, but I'm getting pretty good at multitasking so long as I can keep talking while spinning the cart around and doing that sort of thing." Within this classroom, there is intentional and regular employment of the laptops.

Although receiving their iBooks after students, all teacher participants documented utilizing laptop technology for an array of purposes. Data reported on teacher utilization have been gathered mainly from participant surveys, and through individual interviews. Data collection through observation was largely unsuccessful due to a lack of access. When not being used for instructional purposes, teacher iBooks were often turned so the screen faced away from the classroom, or were positioned on teacher desks; in both cases the screen was obstructed from a clear line of sight. Therefore, most data collected focuses on how teachers utilize the laptops for educational purposes. It is unclear how, if, or how frequently teachers are employing the laptops for recreational or non-academic purposes. Figure 4.2 illustrates how teachers have employed laptop technology for education, and with what regularity and consistency. Data for Figure 4.2 are derived from completed teacher surveys and reinforced during individual teacher interviews. The frequency tallies represent the number of teachers who utilize the technology for purposes denoted within each specified activity.

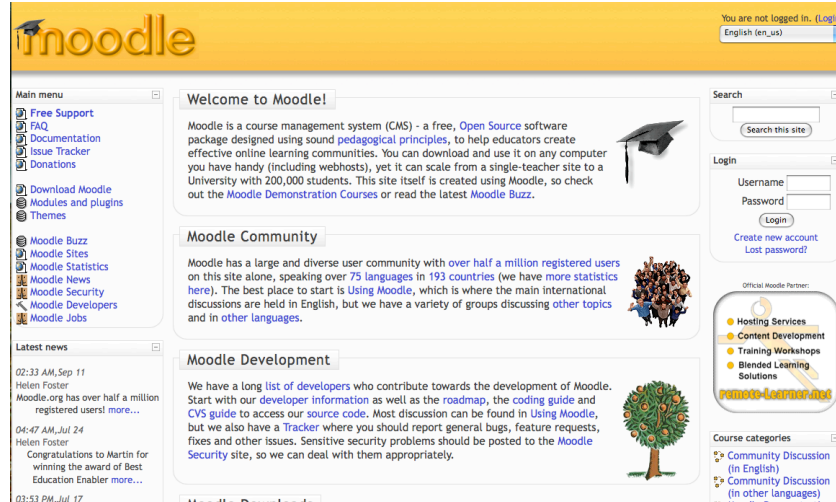
**Figure 4.2 Teacher Usage of Technology**



All teacher participants were recorded as utilizing technology for their lesson planning and preparation, tasks affiliated with e-mailing, searching the Internet for information, and accessing Cardinal Creek High School’s Power School. Power School is a closed system, web-based repository in which members (teachers, parents, students, administrative staff) can login and access information regarding a particular student. Depending on the level of authorship that has been granted, reports can be generated based upon school and district-wide data.

A negligible amount of laptop technology was utilized when employing content specific software/ programs or when accessing and employing Moodle. Image 4.3 illustrates a screenshot of the Moodle interface. Moodle is a free online course management system in which teachers and students alike can contribute and access materials specific to that particular course. Ms. Thompson, Cardinal Creek High School’s science teacher, maintained Moodle as a regular aspect of the course by posting homework assignments and encouraging students to not only access documents, but to submit assignments and projects as well. There are numerous other functions that Moodle offers, yet the teachers who are employing this tool are just beginning to utilize the available features.

**Image 4.3 Screen Shot of Moodle**



Conversely, Power School, though not specifically a course management system, has some of the same features as Moodle. Some of the key features associated with Power School include databases for attendance, grades, lunch counts and balances, and space for posting lesson plans and ancillary materials. Within Power School there is space to post lessons and materials, with a drop box for students to submit assignments, a grade management tool, as well as attendance and lunch count databases. The features that are being employed with Moodle are some of the same being utilized within Power School. A cause of the drastically higher integration of Power School by teachers versus the employment of Moodle is because certain components of Power School are required by district administration in order maintain current student grades and an accurate attendance count. Teachers and/or students no longer deliver a paper attendance sheet to the office on a daily or hourly basis, but rather, by entering this information into Power School, all students, parents, administration, and teachers are able to instantaneously access this information. During the duration of this study, teachers were also charged with posting at least one of their lesson plans onto Power School. The administration



makes a conceded effort to foster, maintain, and saturate teacher's usage of laptop technology for routine activities on a daily basis.

Teachers employ laptop technology for planning and preparing lessons through integration of a variety of tasks. Specific activities that make up lesson planning and preparation when utilizing laptop technology include the creation of worksheets, PowerPoints, Internet searches for information and examples. Some of the more popular search engines and websites utilized when searching on the Internet include KanEd, Thompson/Gale, and United Streaming. In addition to the aforementioned requirement by administration to post an electronic lesson plan onto Power School, teachers also employ laptop applications to create worksheets and study guides for students. PowerPoints that support and/or guide teacher instruction and lectures are commonly documented throughout Cardinal Creek High School. Searching the Internet for information to support instruction and examples to represent instructional concepts are routinely reported by teachers as ways in which the one-to-one laptop technology has been utilized within their lesson planning and preparation.

Teachers are actively employing the laptops for various educational purposes. Based upon both how teachers utilize laptops and how teachers facilitate student laptop utilization, there are ramifications and implications for how the technology utilization is implemented within curriculum and pedagogical practices.

### ***Pedagogical Implementation with Technology Utilization***

The one-to-one laptop initiative, being a school-wide program, has academic implications for not only individuals within Cardinal Creek High School, but also within course curricula and classroom pedagogy. Teachers' instruction and students' learning within classrooms was inevitably enhanced with the implementation of laptops for each individual. Independent of how

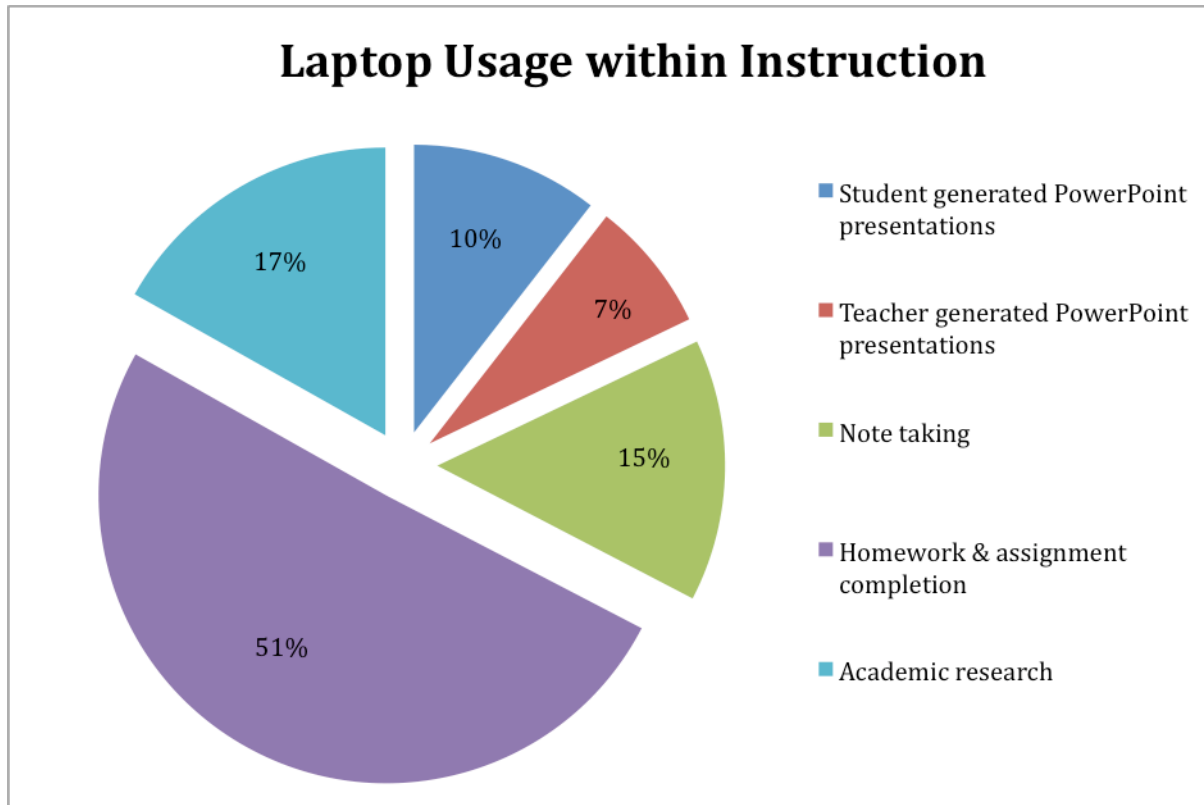
the laptops were utilized by students and teachers, their presence instantaneously created curricular and pedagogical opportunities and challenges. Opportunities have been afforded instructionally to students and teachers alike as a result of the laptops; the Internet allows the instantaneous access to the most current information available. Mr. Smith stated, “I think from the teaching point of view, it (laptops) has made my job easier. I love doing PowerPoints, and we hardly ever use a textbook just because our textbooks are somewhat outdated.” The laptops and the Internet have facilitated not only the ease in which lessons are delivered, but have provided access to information and resources that are current, relevant, and dynamic rather than outdated and static.

Contrarily, because there are so many choices and tools available with the laptops, students can become off task, not attending to what is happening within the classroom. During a tandem focus group interview, one senior student stated, “You get distracted too easily.” Another stated, “It depends on how you learn, how you retain information. People retain information different ways.” Many students demonstrated self-awareness of their learning preferences, realizing that without structure having the laptops, and all the technology afforded by the laptops, sometimes could hinder their optimal learning potential. However, this is not the case for all students, since some shared the sentiment of this student when stating, “I pay attention better if I have headphones and music on.” The laptops in the one-to-one laptop initiative, by the essence of their existence within the classroom environment, have presented pedagogical opportunities and challenges.

Data were collected predominately via extended observations with data supporting findings retrieved through documentation/artifacts, surveys, and individual interviews. Figure

4.3 illustrates how within the 95 documented occurrences, laptop technology was utilized within instruction independent of specific content areas.

**Figure 4.3 Laptop Usage within Instruction**



Instructional occurrences incorporating laptop technology were just over half (51%) being spent on student homework and assignment completion. Out of all the instructional occurrences spent utilizing laptop technology, only 7% were spent on showing, discussing, and teaching with teacher-generated PowerPoint presentations, and only slightly more spent by students presenting PowerPoints which they created (11%). A considerable amount of instruction (15%) transpired though employing laptop technology as students took notes with the aid of laptop software.

Figure 4.3, through illustration of how laptops are being utilized within content area classroom instruction, further represents how laptops remain as a *tool* in which to choose when

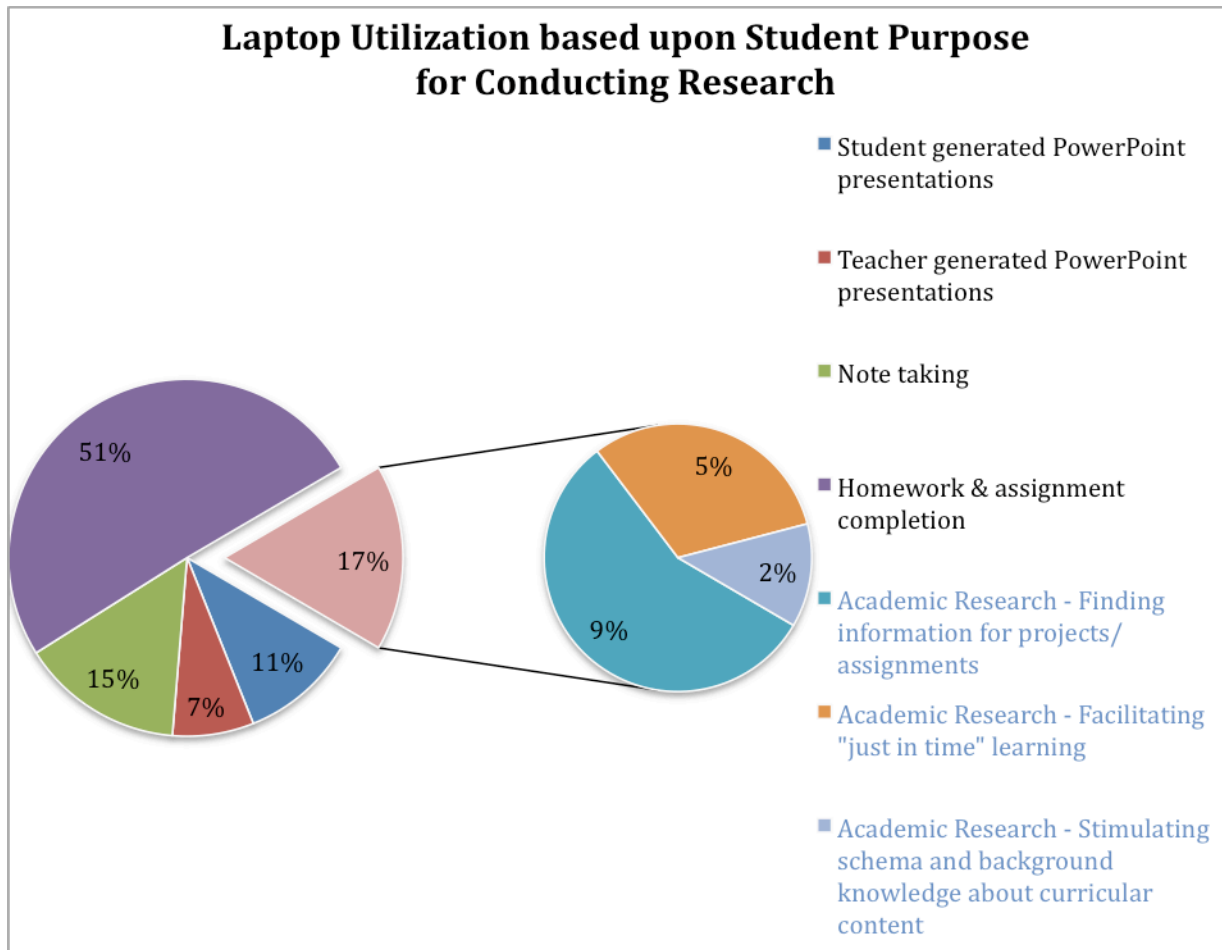
planning or enacting instructional content. Laptops were not necessarily integral for successful lesson implementation and delivery; rather, they are another tool in which teachers could choose to employ and from which students could learn. For instance, many of the PowerPoints generated by both teachers and students could have just as likely been made into overhead transparencies and been presented on an overhead projector. Only rarely was it documented that PowerPoints would hyperlink to video footage or relevant websites. Mr. Smith, who consistently and routinely presented content through PowerPoint, was only recorded during two lessons as embedding video links within his PowerPoint presentation.

Instructional occurrences (16%) were tallied as students performing research on the Internet. This research can be disaggregated into three categories: (a) finding information for projects/assignments, (b) facilitating “just in time” learning, and (c) stimulating student’s schema and background knowledge about curricular content. Figure 4.4 illustrates the percentages with which students perform research on the Internet via the aforementioned categories.

Within Figure 4.4 reflecting the different instructional purposes when using the laptop technology, conducting research (16%) could be broken down into the three subcategories. Conducting research for the purpose of finding information for projects or assignments was most frequently utilized, occurring 9%. For instance, within the social studies classroom, students are sometimes given Internet scavenger hunts that align with the theme of the unit. Mr. Smith states that assignments like these, in which students search for information on the Internet, “allow students to become familiar with the Internet, and how to use search tools, and different things like that.” A sizable portion of laptop utilization when conducting research (5%) was to facilitate students’ need for “just in time” learning. Searches for information to support this need frequently occurred spontaneously; satisfying a need for information that quickly or

unexpectedly arose. For example, when working within an Excel document, a student encountered difficulty in formatting. In collaboration with another student nearby, he accessed the Internet to locate help and assistance in answering his formatting problem.

**Figure 4.4 Laptop Utilization Based Upon Student Purpose for Conducting Research**



Note: Text in blue denotes categories taken from the research conducted by Warschauer & Grimes, 2005

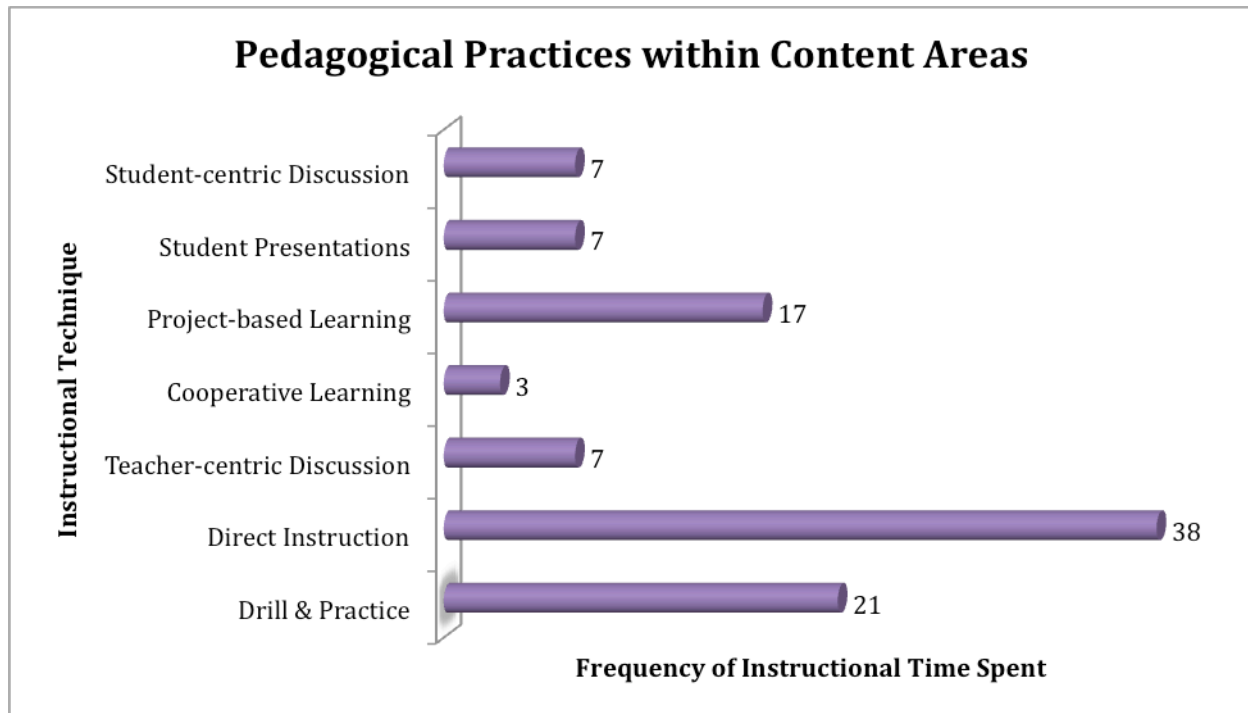
A considerably smaller portion of the occurrences (2%) accounted for conducting Internet research to stimulate schema and background knowledge about curricular content. During science class, at the onset of students' research for the PowerPoint presentation they were to complete about their assigned science content standard, many students were observed initially visiting Wikipedia and scrolling through information within the webpage regarding their topic.

After students became more involved with their project, and had a clearer understanding of the concept in which they were studying and researching, the websites that they visited became more specialized and specific.

Of the ways in which the one-to-one laptop technology was utilized within classroom instruction, it was clear when pedagogy was teacher-centric versus student-centric. Through extended observations, data supports that approximately two-thirds (66%) of instruction is spent on teacher-centric pedagogical practices, whereas one-third (34%) of instructional time is student-centric. Teacher-centric instruction includes teacher led discussion, direct instruction, and drill and practice activities. For example, during many of Mr. Smith's lessons, he would lecture from his PowerPoint about the topic of study. Many times, when there was a class discussion, the questions and discussion topics were generated by Mr. Smith, the driving force and a key individual within the classroom conversations. Conversely, student-centric instruction includes student led discussion, student presentations, cooperative learning, and project-based instruction. An example of this, was the many student created PowerPoint presentations in which the student was the driving force within the lesson. Ms. Apple and Ms. Thompson frequently employed student-centric instruction through their utilization of student-generated presentations.

Figure 4.5 illustrates the frequency of instructional techniques/pedagogical practices utilized within content areas. Data for this figure were collected predominately via extended classroom observations. The frequency is the tally of how often each instructional technique was observed occurring. The three instructional techniques within Figure 4.5 that align to teacher-centric pedagogical practices include: teacher-centric discussion, direct instruction, and drill and practice.

**Figure 4.5 Pedagogical Practices within Content Areas**



Independent of content areas, data demonstrate that a predominant amount of instructional time is spent on pedagogical practices that are teacher focused and led, with direct instruction ranking highest as the most frequently employed instructional technique within content area classrooms. Pedagogy fostering drill and practice methods ranked second in the amount of instructional time that was spent.

Figure 4.5, in addition to illustrating the frequency by which varying instructional techniques were employed within content area classrooms, further implies that while laptops were available and accessible within the classroom, teachers' pedagogical and instructional choices predominately remain teacher-centric. For instance, in an interview with Ms. Apple, when asked about her philosophy of education and if it has evolved or changed since the implementation of the one-to-one laptop initiative, Ms. Apple stated:

*I was clearly a direct instruction kind of person. I had an idea that kids needed to see authentic uses and applications for content, but I had not totally embraced the idea . . . I*

*was under the idea that, that's where you end. You teach them the skills and then they get the honor of seeing where they use it. . . . Instead, while you're doing a project, you're using it (content), and the technology allows you to have a lot more distance where you can Google just about anything and find out a lot of information. That opportunity allows for project-based learning to happen so much better.*

Although Ms. Apple perceived the benefit of more student-centric pedagogy as in project-based learning, when observing within her classroom, direct instruction still played a predominant role during lesson delivery.

The laptops within the one-to-one initiative are being utilized within instructional and pedagogical practices for a variety of tasks. The one-to-one laptop initiative was perceived as impacting how instruction was delivered and how curriculum was implemented.

### **The One-to-One Laptop Initiative's Effect upon Content Area Literacy**

Literacy practices within individual content areas vary considerably between classrooms, contents, and pedagogical styles. What constitutes content area literacy is dependent upon the necessities of the course and its curriculum, and the role literacy plays in light of these requirements. Findings presented within this section were collected through extended observations, teacher insights shared during individual interviews, and student insights shared during group interviews. To provide due diligence to data collected regarding content area literacy, this section will be divided into the following subcategories: (a) content area textual formats and modes, and (b) content area literacy instruction.

#### ***Content Area Textual Formats and Modes***

Ms. Thompson tells the class that they are to work on their study guide about Boyle's Law. Rustling ensues within the classroom as students rummage through their bags and folders to find their study guide and take out a pen or pencil. Some students also take out, open, and



turn on their laptop iBooks, while others approach Ms. Thompson about borrowing a hard copy of their textbook. Students group their desks together into clusters of three to four students. One group of students has chosen to utilize the digital textbook downloaded onto their laptop. One student has opened his iTunes application, plugged in his headphones, and put one ear-bud into the ear farthest from the students working in the group. The student groups within the classroom converse. Many focus on the task to complete the study guide. Ms. Thompson sits in the back of the classroom working on her iBook at her desk. Suddenly, one student group erupts, stating he found it, IPIPIP, the short cut he was seeking. One of the students within the group looked in the textbook while another searched for the answer on the Internet. The student who found the answer, located it on the Internet stating, “The Internet is good; book, bad.”

Not having to haul around a thick textbook, not having to worry about losing or misplacing a very expensive textbook, imagine this scenario, in addition to being able to access information instantaneously that is more current than any published textbook can be. Students within Ms. Thompson’s science classes have a digital textbook downloaded onto their individual laptop at the beginning of the year. This digital textbook looks identical to its hardcopy counterpart, but there are differences that create opportunities and challenges for those using them.

***Searching for information and content.*** To be efficient and effective when searching for and accessing information and content within a digital text, one must be aware how to approach the features and tools that are available with the digital text. The table of contents and other pre-formatted fields become important forms for students to understand and utilize in order to effectively and efficiently navigate within the digital text. As opposed to hardcopy texts, digital texts uniquely offer hyperlinks providing additional information about a topic or concept, “just in

time” learning, and/or background information. These hyperlinks can connect directly to other sections within the digital textbook, or, if access is available, directly to a relevant Internet webpage. Additionally, through control+clicking on a section within the table of contents, one can be immediately connected to the beginning of that section in the “book”. Students are also afforded other techniques to search for content and sections within the digital text. Accessing the Find task window from the edit toolbar permits one to type in a word or phrase that is of interest or that needs locating within the digital text. It will pull up all the occurrences on the active, viewable screen. The Go To task window allows for a similar function, only it is limited to searching for pages, headings, bookmarks, tables, sections, footnotes, captions, and other notable text features that are provided as options. Each of these choices permits a way into information, material, and content of the digital text that would be more limited if restricted to the hardcopy text.

***Lack of connection between the text and the reader.*** Cutting, pasting, annotating, and highlighting all allow the reader to interact with the text in order to support their ability to make meaning from the text. Digital texts commonly permit these types of activities encouraging the reader to respond to, interact with, and make meaning from the text. This particular digital textbook series did not allow for the retention of these types of functions. A student could highlight a particular section of text, but once the digital textbook application was closed, any annotations or modifications to the original text would be lost. Students gravitated toward the hardcopy text, almost unconsciously; during a particular observation, one student immediately turned to me upon entering the classroom and states, “It’s a lot of book work today so there is not really a lot of technology being used.” Thus, when the textbook was necessary as a reference or needed in order to complete an assignment, students jockeyed and negotiated for the few tattered

hardcopy texts available rather than opening their iBook with their downloaded digital version of the text.

*Supports and adaptations for struggling readers.* Within this digital textbook series, students could temporarily modify the appearance of the text in order to make it more accommodating to read. For instance, the text itself could be enlarged for those with visual impairments. However, once the screen containing the digital textbook was maximized as enlarged text it may not be able to fit the entire page on the screen, depending on the size. Therefore, one would have to not only scroll up and down, but to the right and left in order to view the entire page within the document. Many students found this feature frustrating while some benefited from it. Ms. Thompson remarked about the relationship students had with the digital textbooks, “It’s a love hate thing.”

Other features that support readers who are struggling to read and comprehend content from the digital text include the ability to temporarily highlight text as it is being read which can help students who may have difficulty with tracking text and/or maintaining fluency. The ability to intensify the color distinction of text can make it easier for some to read. Another tool that is available with the digital textbook allows for the text to be auditory “read” to students. This allows being able to concentrate on making meaning from the content rather than focusing on the skill level students need to comprehend and fluently read the words of the text. These aforementioned digital textbook characteristics allow for the text to be adapted for those who may struggle with reading.

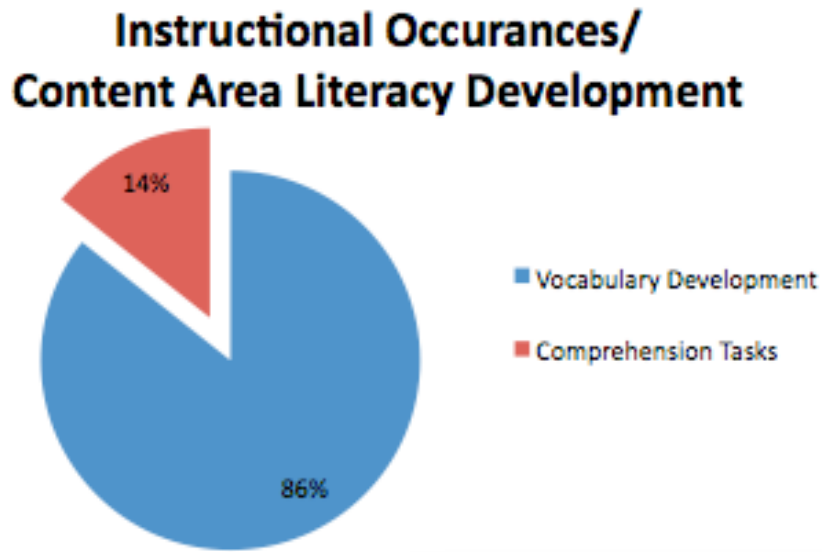
In addition to the implementation of digital textbooks that the laptops have afforded, the one-to-one laptop initiative has also provided content areas with access to current information via the Internet. The Internet offered examples and models that supported the content and

curricula being taught. The Internet also allowed for “just in time” learning. When the occasion called for it, students were able to search for and locate information that furthered their background knowledge about a subject and/or concept. Some teachers relied more heavily on the Internet and information found via the World Wide Web than they did on their textbooks. Mr. Smith, the social studies teacher, commented, “We hardly ever use a textbook just because our textbooks are somewhat outdated.”

### ***Content Area Literacy Instruction***

Ms. Hamilton, language arts teacher, states, “High School teachers are not trained to teach reading, and there are a lot of our students who are really low. Nothing can be sent home for students to read independently and be expected to understand it, so we read in class together.” Other teachers at the school share this perception as well, not feeling prepared or trained in how to support the reading and literacy needs of students. However, there remain specific literacy activities occurring within content area classes. Figure 4.6 illustrates the percentage of instructional occurrences teachers spent on tasks related to content area literacy development. Categories contained within Figure 4.6 were taken from the work conducted by Vacca and Vacca (2002), and the reported data is derived predominately from classroom observations and field notes. Individual interviews further reinforced and supported these findings. During the extensive classroom observations within multiple content areas, 14 specific occurrences were documented in which teachers instructionally attended to students’ content area literacy development.

**Figure 4.6 Instructional Occurrences/ Content Area Literacy Development**



Note: Categories from the work of Vacca & Vacca, 2002

Clearly, when viewing the pie chart, the dominant portion of instructional occurrences dealing with content area literacy tasks were related to vocabulary development (86%). This constituted of defining the vocabulary words, and recalling the vocabulary word from either a definition or example. The specific form vocabulary instruction took within the content area classrooms varied dramatically based upon the content area. A much smaller portion of instructional instances were devoted toward comprehension tasks (14%). During an interview with Ms. Hamilton, she stated, “High school teachers are not trained to teach reading. . . . A lot of our students are really low, so nothing can be sent home to read independently and expect them to understand it. So we read in class together.” Perceptions as this coupled with the data that are documented within Figure 4.6 illustrate that there is insecurity on the part of teachers to competently address the content area literacy development of their students. It becomes logical and natural to emphasize vocabulary development because of its straightforward nature. The

necessity exists for content specific vocabulary development to successfully progress and learn content area concepts.

### ***Vocabulary Development***

In the mathematics and science classrooms, a considerable portion of the instructional occurrences observed regarding vocabulary development, were through defining words and at times providing examples to further explain how the word/term was utilized. Additionally, in the science classroom, Ms. Thompson would at times provide cloze passages (Vacca & Vacca, 2002) in which student would complete their notes by reinforcing the technical, content specific vocabulary. As Ms. Thompson lectured and reviewed the content from the textbook, students completed these cloze passages with the vocabulary that had been guarded and reinforced.

In Ms. Apple's class, vocabulary and concepts were fostered and developed through the frequent use of mnemonic devices. During a lesson on trigonometric functions, Ms. Apple told students how to remember to solve them by stating, "Some old horse caught another horse taking oats away." As she said this, Ms. Apple simultaneously wrote on the whiteboard SOHCAHTOA which translates mathematically into, "the sine of an angle is the ratio of the opposite side of the angle to the length of the hypotenuse or opposite over hypotenuse, the cosine is derived from the adjacent side over the hypotenuse, and the tangent is calculated by the opposite side over the adjacent side of the triangle." Through mnemonics like these students are able to better understand and develop their knowledge about content specific vocabulary and concepts.

### ***Comprehension Tasks***

Within the 14% of content area literacy instruction spent on comprehension tasks from Figure 4.6, two qualifiers arose that further divided comprehension tasks based upon the intention of the task: content/concept comprehension and reading comprehension. The

discrepancy within comprehension tasks rested in the intention of the task, whether it fostered content area or specific concept comprehension or supported meaning made from what was read, facilitating students' reading comprehension.

Data document that the vast majority of instructional occurrences are dominated by encouraging comprehension of specific content and concepts. For instance, in Ms. Hamilton's classroom, students were asked comprehension questions about the Victorian period poem, *Rhyme of the Ancient Mariner*. Students were asked to recall the order of events within the poem, to respond to questions about the meaning, interpretations, and understanding of the poem and its message. As a result of questions of this nature, students were encouraged to comprehend the content and concepts of the poem. A slighter portion of instructional occurrences was spent on comprehension activities intending to support reading comprehension. For example, in the science classroom, during a lesson on erosion, Ms. Thompson asked students, "What kind of climate produces wind erosion? What is the difference between weathering and erosion? What types of particles can wind move?" These questions were asked intermittently during the lesson and the textual segments, seeking clarification and encouraging the comprehension of the passage that was to be read.

Teachers developed the content area literacy of students in their classroom through vocabulary development and comprehension tasks. The majority of content area literacy instruction occurred after students had completed their reading tasks (72%). Post-reading activities included worksheets, study guides, or questions that covered content from the reading. The remainder of instructional occurrences was split between pre-reading activities (14%), and during reading management tasks (14%).

Content area literacy activities that were pre-reading tasks, were characterized as occurring prior to the reading task. These activities were geared toward developing the background knowledge necessary to be successful within the reading task. For example, prior to beginning the Victorian era in the language arts class, and extended reading of texts from this period, Ms. Hamilton discussed with students the time period and set the stage for readings of that era.

During reading segments, management tasks fostered successful content area literacy skills. For instance, in Mr. Smith's social studies classroom, he routinely integrated PowerPoint presentations into his lectures. In between slides that contained large amounts of text to be read and retained, there would be intermittent slides that posed comprehension or relevant trivia questions, or slides that incorporated brief video clips that pertained to the concept. These techniques to manage reading tasks encouraged successful content area literacy practices.

The dominant portion of content area literacy instructional occurrences was through post-reading activities. These tasks often consisted of worksheets and study guides that students were to complete after reading a text passage. These activities often were structured as homework tasks.

This section illustrated the data collected regarding content area literacy instruction within a setting that has integrated a one-to-one laptop initiative. Data regarding the digital textbooks within the science courses were also highlighted and expanded upon.

### **The Role of New Literacies within the One-to-One Laptop Initiative**

The one-to-one laptop initiative at Cardinal Creek High School offered an array of potential in order to foster, promote, and exhibit skills associated with the new literacies. When

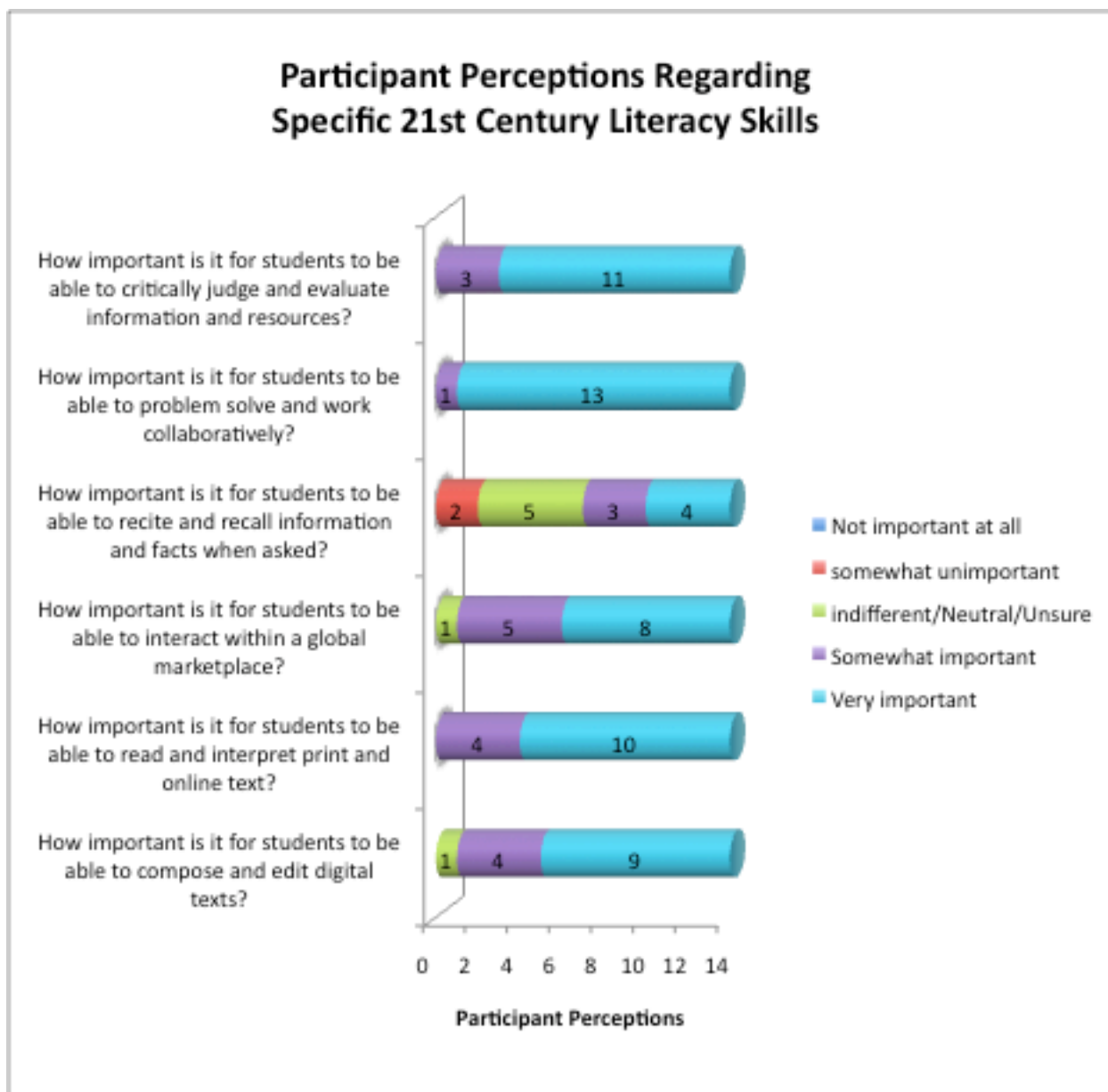


interviewing and talking with teacher and administrator participants, they found the terminology associated with the new literacies was somewhat new, foreign, and unfamiliar. Dovetailing discussions to skills associated with those needed to survive and thrive within the 21<sup>st</sup> century, participants were more familiar and confident in their responses. However, due to the ambiguity in many discussions and interviews regarding the role of new literacies within the one-to-one laptop initiative at Cardinal Creek High School, the majority of data findings in this area were collected through classroom observations, and a survey for teacher and administrator participants in which responses are based upon a Likert scale (Appendix N). Data from this survey rated how important administrator, teacher, and paraprofessional participants perceived particular skills within student's education. Figure 4.7 notes the findings regarding participant perceptions from this survey. There were three sets of skills that administrator and teacher participants perceived decisively as being important for students to be able to apply. These included the ability for students to (a) critically judge and evaluate information and resources, (b) problem solve and work collaboratively, and (c) read and interpret print and online text. The skill that held the highest importance in participants' viewpoints was the ability to problem solve and work collaboratively, with 13 participant responses identifying this skill as "very important" for students to be able to do, and one individual responding that the skill was "somewhat important" for students.

There were some skills that elicited responses from participants that were neutral, unsure, or indifferent. These included the ability for students to (a) recite and recall information and facts when asked, (b) interact within a global marketplace, and (c) compose and edit digital text. Of these skills, students' ability to recite and recall information and facts when asked was documented as having the most discrepancy within participant response rates. Seven responded

that this skill was very to somewhat important, with five being indifferent, unsure, or neutral, and two individuals perceiving this skill as somewhat unimportant for students to be able to do.

**Figure 4.7 Participant Perceptions Regarding Specific 21<sup>st</sup> Century Literacy Skills**



Overall, teacher and administrator participants viewed the skill sets presented within the survey as important at some level for students to be competently able to apply. Administrator

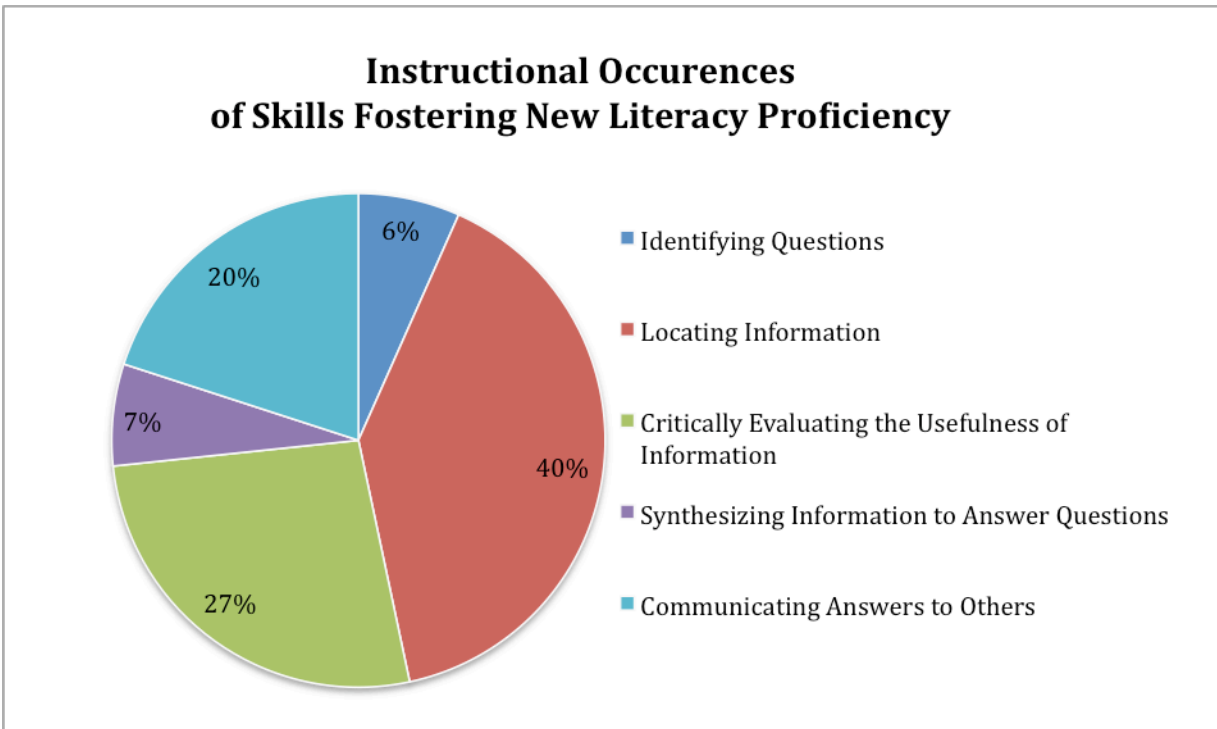
and teacher participants alike did not perceive any of the skills as “not important at all.” However, even though participants responded favorably and in support of students adeptly performing these skills, classroom instruction and learning activities did not always align with and support the viewpoints presented within this survey. These skills were not necessarily fostered within classroom instruction. Of the skill sets described on the survey, teachers were documented during classroom observations as utilizing questioning techniques in which students were asked to recite and recall information and facts. This was reportedly the skill that created the most inconsistency regarding its importance. As for the other skills, only limited opportunities existed within the classroom for these skills to be fostered and practiced.

In order to optimize the efficacy of new literacies, certain skills are utilized in order to optimally function within the 21<sup>st</sup> century learning environment. Figure 4.8 illustrates the percentage of occurrences by which these new literacies skills were utilized within the courses and classrooms at Cardinal Creek High School. Data for this figure were derived from extended classroom observations and field notes. Throughout the study, there were 15 clear and specific instances in which these new literacies skills were either addressed or fostered, and it is these occurrences in which that the data are portrayed.

It is apparent that locating information is a new literacy skill that is practiced and utilized the most frequently within instruction, activities, and teaching tasks, being documented by occurring 40% of the time. Other predominant skills associated with the utilization of new literacies are the ability to critically evaluate the usefulness of information, with 27% of instructional occurrences fostering this new literacy skill. Communicating answers to others (20%) ranked next as being utilized when promoting proficiency within new literacies. The least

utilized and practiced new literacy skills were synthesizing information to answer the questions posed (7%) and identifying questions (6%).

**Figure 4.8 Instructional Occurrences of Skills Fostering New Literacy Proficiency**



Note: Categories from Leu, Kinzer, Coiro, & Cammack, 2000

The documented data reveals that there is a sizable emphasis instructionally within the classroom for students to be able to successfully locate information. Although this is an essential skill to utilize and master when employing the new literacies, it too becomes more of a basic and foundational skill that must be built upon to truly become proficient within the new literacies. Skills associated with synthesizing information to answer questions posed are not nearly as emphasized, and these skills require higher order thinking and thought processing. Although basic utilization and employment of the laptops and the Internet may be the current aim of Cardinal Creek High School, one administrator stated:

*I think our kids are going to walk out of here after four years and have a very good understanding of just how to manipulate the computer, how to get on the Internet for*

*research reasons, how to use Word and Excel for saving data, organizing files, and things like that. I think they will be ahead of kids that don't have the laptop in their hands all the time.*

This perception and aim jointly reflected within Figure 4.8 illustrated contentment at fostering and encouraging basic, functional new literacy skills.

The new literacies were a part of instruction within the Cardinal Creek High School. However, the role new literacies played within individual classrooms varied considerably. Within the next subsections, short illustrative, observational vignettes and data findings are presented to illustrate how the new literacies were fostered and encouraged within individual content area classrooms.

### ***New Literacies within the Language Arts Classroom***

Within the language arts classroom, a laptop-closed policy was typically the norm, thus limiting the potential quantity of new literacy learning opportunities available. However, new literacies persist within the course, curriculum, and classroom.

For the final senior project, students were required to read and analyze three different writings from an author, and then to create a representative PowerPoint. In past years a Hyperstudio project was required, but with the prevalence of Microsoft Office software, a transition was made in this assignment's presentation mode. Ms. Hamilton prefaced that when scoring these final projects, visuals and images would only be constituted as 25% of the individual grade for the PowerPoint. "I'm going to only be looking at the pretty of the presentation for 25% of your grade. I don't want you to focus on the fluff of pictures and such." Within the new literacies framework there are multiple versions of what can constitute new literacies; for instance, computer literacy, information literacy, media literacy, and visual literacy

(Semali, 2001). When utilized and employed effectively, efficiently, and with discretion, images and pictures can be just as substantive as written content (Kist, 2005).

As a scaffold for the senior final project, students were required to complete a storyboard of the content they intended to include within each slide of their PowerPoint. This storyboard was completed on hardcopy worksheets and turned into the teacher prior to beginning the actual PowerPoint project in order for the teacher to provide feedback before working towards the “final draft.” While preparing the storyboards, students were to work individually, justified by the teacher because each of the students was analyzing different writings and different authors. Therefore, discussion was unnecessary, while good “concentration time” was necessary. During this process, one student raised his hand and asked if it was acceptable to cross something out if he made a mistake on a storyboard frame or decided he wanted to redo it. The teacher responded that since they were still in the draft stages, it was appropriate.

A cornerstone concept of the new literacies is change (Leu, Kinzer, Coiro, & Cammack, 2000). The nature of new literacies is deictic as are the new literacies themselves. Students within the language arts classroom were documented as being hesitant to make mistakes and encouraged to take risks when it came to working on a draft of their final senior project. Within 21<sup>st</sup> century literacies, rarely is a document or presentation finished and final. Rather, new literacies are grounded in change, thus giving way to more current information and further refined insights. The language arts classroom subscribes to the “new wine in old bottles” paradigm (Lankshear & Knoble, 2003) in which teacher instruction remains relatively unaltered; it is just packaged within a new literacies façade.

### *New Literacies within the Mathematics Classroom*

Mathematical reading and literacy often involve reading and comprehending mathematical equations. When these mathematical equations are written on a computer screen, they may read differently depending on how they were constructed, thus meaning something entirely different than what was originally intended. For instance, during a student PowerPoint presentation about the Pythagorean theorem, the equation was written as “ $C2=A2+B2$ ” which provides an inaccurate reading of the theorem. When presented with this situation, Ms. Apple was quick to verify that the individual student did indeed understand the theorem, but at the time did not have the tools to write or type it properly. A brief tutorial ensued, regarding how to superscript text in order to express exponents, turning  $C2=A2+B2$  into  $C_2=A_2+B_2$ . This teachable moment allowed students to recognize and access the tools they had at their disposal in order to better and more clearly articulate their thoughts and communicate mathematically.

In the mathematics classroom it is vital for students to have the skills necessary to read, write, and understand digitally presented mathematical equations and data. Ms. Apple, Cardinal Creek High School’s mathematics teacher, routinely utilizes an array of digital software that supports her instruction and student learning within the classroom. In addition to the Texas Instruments (TI) graphing calculators and complimentary tools, software like Grapher<sup>®</sup> and GSP<sup>®</sup>, Geometers and SketchPad are installed on the iBook computers of students. These software programs allow students to perform tasks that can be completed with graph paper, pencils, and protractors. Through the utilization of this software, however, students are able to more efficiently perform the exact same task. There is also more of an emphasis on the *why* versus the *how*.

Students are continually asked why a graphed equation looks as it does, checking to make sure the graph that was created is correct and accurate. In graphing the same equation long hand, there is considerable instructional time spent physically creating the same graph that was produced after entering in an equation and clicking the “graph” button. In addition, when a mistake or mis-entry occurs, the software programs will alert the user. In Grapher<sup>®</sup>, a hazard triangle with an exclamation point in the center appears to the side of an equation when there is something wrong with how the equation was written, thus prohibiting it from graphing. When an equation is written acceptably, a blue box with a checkmark inside it appears next to the equation. These signals and tools provide immediate feedback to students allowing students and users, in general, to check their work and support their comprehension of the process.

During instructional time, the teacher orchestrated technology usage so that it was efficiently and effectively employed with purpose and meaning always at the apex. By projecting the computer screen onto the whiteboard in the front of the classroom, one student “driver” manipulated the active software application, entering equations and graphing these equations. Concurrently, Ms. Apple was at the whiteboard with dry erase marker in hand annotating what has been projected and what should also be displayed on all student computers.

During one of these lessons, an issue arose. One student was using a “loaner” iBook while his was being fixed. The loaner computers do not have specialty software installed due to licensure reasons. The Instructional and Technology Coordinator was not in the building that day in order to temporarily install the needed software onto this student’s computer. Ms. Apple, the mathematics teacher, decided that with her class assistance, they might be able to locate free graphing software on the Internet to download onto this student’s computer. The student, who needed the software to complete the class period’s activities, identified the problem that required



solving. Ms. Apple offered permission and a possible solution, and then working together, the class focused their attention to the Internet. The student “driver” of the computer screen being projected onto the whiteboard skillfully accessed Google. Taking suggestions and comments from classmates, he entered “free downloadable graphing software” into the query text box. When the list of possible and potential websites appeared on the screen, students collaboratively decided to further investigate some site and not others based upon the URL address or the description given for the site. After a couple failed attempts, acceptable graphing software that could be downloaded for free was located and installed onto the student’s computer. This process transpired over approximately 5-7 minutes, and the class returned attention to the instructional activities Ms. Apple had planned for the day.

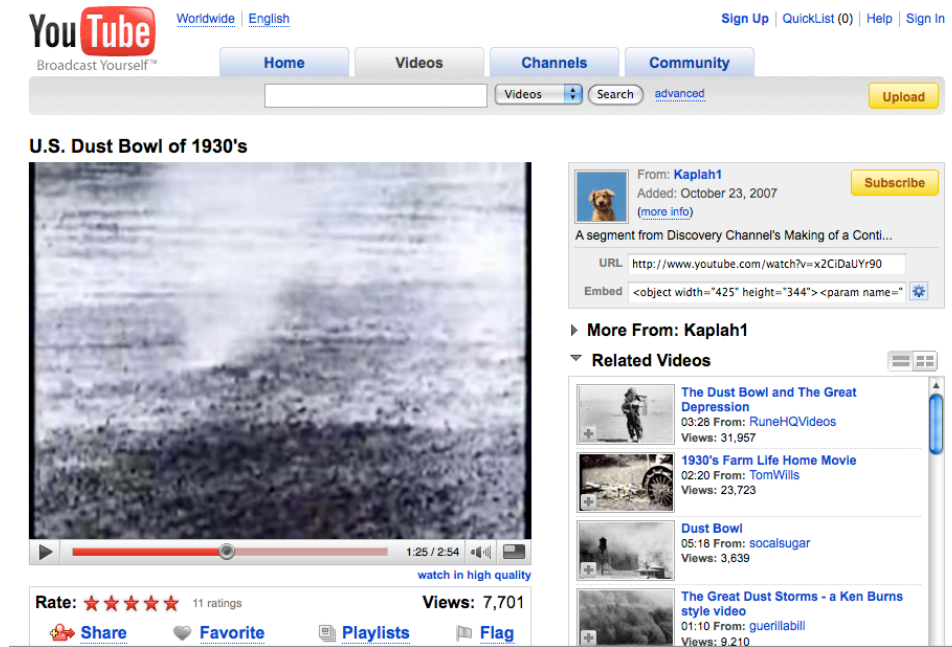
In this practical example of how new literacy skills are enacted within the classroom, a situation arose that called upon students to work collaboratively to locate information about free graphing software. Although it is not overtly, explicitly, or even consciously touted as fostering new literacy and 21<sup>st</sup> century skills, practical problems and issues similar to this example provide opportunities for students to practice these skills. Technology and the new literacies within the mathematics classroom offer new ways to work and solve both traditional mathematical applications and practical problems.

### ***New Literacies within the Science Classroom***

Without consistent and reliable access to a projector, Ms. Thompson, Cardinal Creek High School’s science teacher, encouraged students to utilize their individual iBook laptops when possible to support instruction. To begin a lesson on weathering and erosion, Ms. Thompson focused student attention by having students access a brief YouTube segment

regarding the Dust Bowl. Image 4.4 is a screen shot taken from the video that was shown as an introduction to the lesson.

**Image 4.4 YouTube Dust Bowl Exemplar**



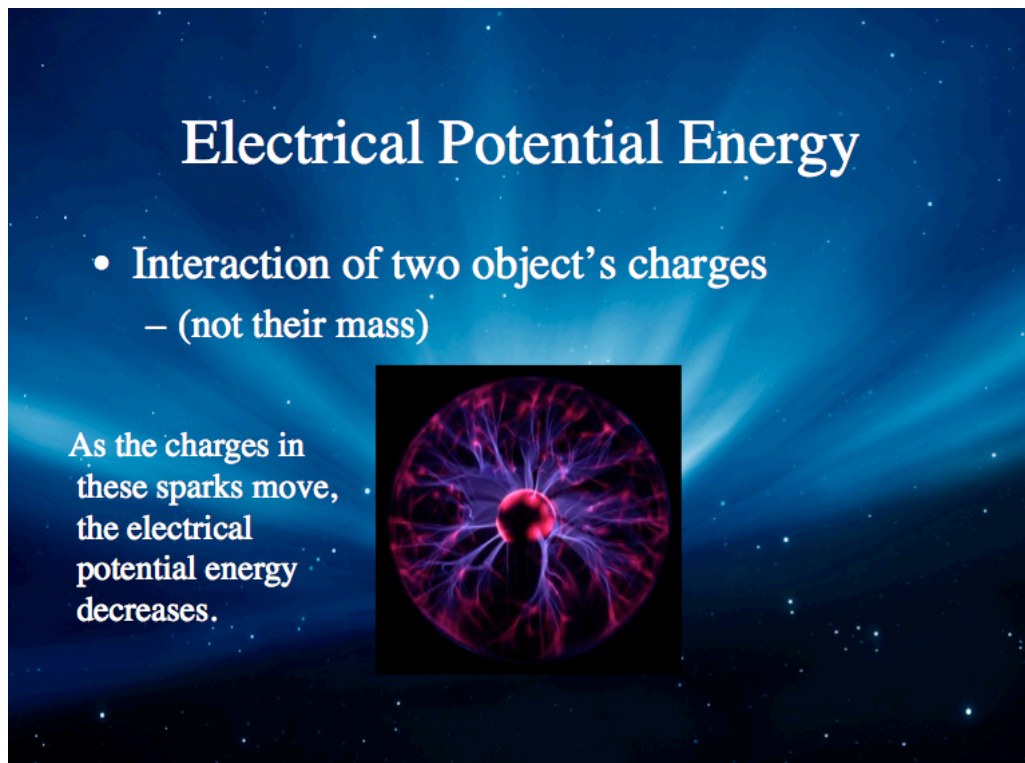
A relatively lax Internet filter allows students and teachers to access most websites. Even though YouTube is a website that is aligned to pop culture and a considerable amount of content that is non-academically based, it contains videos that can support and enhance classroom instruction, as demonstrated by Ms. Thompson. This video provided a way into the lecture on weathering and erosion. However, when the lecture/direct instruction officially began and students were to take notes, two of the five students in the classroom took their notes on their iBook, and the other three chose to take notes with paper and pencil.

If the technology is available and present, that does not necessarily mean that it will be utilized. Encouragement can come in the form of a requirement. One method by which Ms. Thompson supports new literacy skill development within her science classroom is through a content standard assignment. Within all science courses, students were given the task to

research, prepare, and share a PowerPoint presentation that aligned to one of the content standards for the course. Ms. Thompson rationalized this assignment by stating, “Even though only juniors are only tested (on these standards) it is still good practice. If they research their question maybe they will at least get the questions on their standard they researched correct.” The justification of this teacher was that through exposure to presentations over all content standards students would gain some knowledge. However, through conducting more in-depth research about one particular standard, when a question on the state test arises that addresses the standard they researched, students may score correctly for that answer.

Students were given class time to conduct some of the research necessary to complete this content standard assignment. Once they begin, class periods were monopolized with student PowerPoint presentations. Image 4.5 illustrates an example of a slide from a PowerPoint presentation created by one student.

**Image 4.5 Student PowerPoint Slide Sample**



Individual PowerPoints varied slightly in style, employing unique background designs, fonts, and color themes. However, the content that was presented was very similarly delivered from PowerPoint to PowerPoint, beginning with the definition of terms associated with the standard in question. Slides were consumed with bulleted text that the student read from the screen behind him/her. Sometimes the student might have printed off the slides and then read from the print out so as not to have to turn around. Intermittently, there might be an illustrative picture or data graph that supported the text on the slide. Presentation durations hovered around 10 minutes in which the student presented information they obtained from researching the content standard, at a knowledge and at times comprehension level. During each presentation, the remainder of the class was required to take notes, some taking notes in a word processing document, while others preferred to hand write theirs using a pen or pencil and paper.

The laptops of the one-to-one laptop initiative were being utilized within the science classroom with an attempt being made to encourage new literacy skills. However, there was limited guidance provided to students regarding *how* to successfully achieve this. Ms. Thompson states, “I assumed that they know some basics, like I didn’t show them how to use the PowerPoint, I just said make a PowerPoint presentation and have it ready by Friday or whatever, so I just assumed that they know how to do it.” It was assumed that since these students had grown up within a digital world and are digital natives (Prensky, 2001), then they could competently locate, research, evaluate, synthesize, present, and share information on a topic.

### ***New Literacies within the Social Studies Classroom***

Students enter the classroom immediately opening and turning on their individual iBook laptops. Some listen to iTunes, most search the Internet for a current event story to print off and share with the class. Students are required each day to locate and share with the class a current

event or news article. Students do not then get out their textbooks; instead, Mr. Smith, Cardinal Creek High School's social studies teacher, moves to the front of the classroom and opens his iBook and the PowerPoint presentation that will support his lesson's instruction. From this PowerPoint, Mr. Smith derives his note taking for the lesson, and students take notes, all recording their notes in a word processing document. These PowerPoint presentations incorporate multimedia, hyperlinks, and content displayed through brief bulleted talking points. Mr. Smith conscientiously and actively models for his students *how* to present information in PowerPoints. He also explicitly addresses how to effectively and efficiently take notes, rather than recording nothing or attempting to transcribe everything verbatim. Mr. Smith states, "I email some students with the PowerPoint who have trouble taking notes, and that takes a lot of the stress away from them and allows them to pay closer attention to what's going on. Sometimes I throw big chunks of notes up there and they're worried about getting everything down word for word, and I'm trying to teach them to paraphrase."

Through routine utilization of the iBook laptops, the Internet is also instantaneously available. During one particular lesson about economics, in the middle of the PowerPoint presentation and concurrent discussions, the teacher asked the class, "Who has their Internet up? Find out what our national debt is." He guided students by telling them of a website in which there is a "ticker" that reports a real-time estimate. In less than 30 seconds, one student found the answer, shared it with the rest of the class, and all moved forward with the focus and main thrust of the lesson. This transaction of information illustrates "just in time" learning (Warschauer & Grimes, 2005) that is so characteristic of the new literacies and the literacies needed within the 21<sup>st</sup> century.

While it is clear that the laptops and the new literacies were utilized within all of the classrooms that participated within this study, each content area classroom employed the laptops uniquely and emphasized different skills necessary for effective and efficient usage of the new literacies. The common thread that entwines the instruction of the new literacies, and students' utilization of new literacy opportunities is that of exceptionality, uniqueness, or individuality. Within each content area classroom, the whole class rarely addressed new literacy skills; rather, specific individuals were impacted or effected. During one tandem focus group interview, a student stated, "It depends on the class, it all depends on the teacher." For this student, her level of participation, focus on attention, and overall learning were highly dependent upon the course, the teacher, and the instructional technique employed with regard to the new literacies.

The one-to-one laptop initiative at Cardinal Creek High School offered multiple opportunities for students and teachers alike to access and utilize the new literacies. There was even more variety in how the skills needed to efficiently and effectively employ the new literacies which transpired within individual content area classrooms. Based upon the data and the illustrative vignettes, individual teachers utilized laptop technology within their classrooms differently and for different purposes. They had distinct pedagogical styles and diverse expectations for students, which affected the role of the new literacies within their classrooms.

### **The Role of Critical Literacy within the One-to-One Laptop Initiative**

Ms. Hamilton, language arts teacher, states, "I want to get the students thinking so I don't do a lot of the computer stuff, because I want them to do the thinking, to think critically and analytically." Data collected from the study documented that critical literacy, as defined within this research, is not regularly, routinely, or systematically occurring during instruction at Cardinal Creek High School. Instead, critical reading is the skill set that was most readily

discovered within this research. The opening quote within this section from Ms. Hamilton further supports this disparity revealed between critical literacy and critical reading.

When focusing specifically on critical literacy and the role it played within the one-to-one laptop initiative, there was a discrepancy among teacher participants' perceptions regarding their interconnectivity. Some teachers viewed fostering student's critical literacy *independent of* utilization with the laptop technology. Others perceived critical literacy skills as *integral* when employing the one-to-one laptop technology. For example, during a conversation with the resource teacher, she expressed the perception that critical literacy was a skill that was integrally important when successfully and safely utilizing the Internet, specifically sites like Facebook and MySpace. She stated, "I'm not sure how to impress upon them (students) the importance that anything you put out there (the Internet) someone can track down or hack into." This viewpoint further exemplifies that even when there is a perception by teachers that critical literacy and critical reading are integral when employing the technology afforded by the one-to-one laptops, there still is the disconnect between what they perceive to be important and what they pedagogically put into practice.

This section reports the data findings that illustrate the role critical literacy played within the one-to-one laptop initiative at Cardinal Creek High School. Findings are based upon data collected through extensive observations and individual interviews. To elaborate on the various findings, this section is subdivided into the following subsections: (a) attitudes of agency, and (b) the power dynamic and critical literacy pedagogy.

### ***Attitudes of Agency***

Based on the research of Dozier, Johnston, and Rogers (2006), a teacher must attend to more than instructional goals and literacy skills, in order to foster critical literacy. Emphasis

must be placed upon relationships, dispositions, and values with respect to social justice. Teachers within Cardinal Creek High School approached classroom pedagogy uniquely and supported classroom relations and interactions distinctively, thus leading to original opportunities to encourage agency within students and foster their critical consciousness.

An attitude of agency was requisite in order for students to audaciously enter into dialogues and discussions that attend to critical literacy. The student placed his/her perceptions and viewpoints out in the open, vulnerable to disagreement and/or criticism. Classroom climates of individual courses were created prior to data collection of this study. The interactions between students and between the teacher and students perpetuated these unique classroom climates on a daily basis. Some of these classroom environments supported an affect of agency whereas others were inhibitive.

When the occasional critical literacy discussions surfaced, the verbiage directed toward students, and potentially toward their viewpoints, was typically respectful, dignified, and professional. During routine classroom interactions, however, some teacher comments toward students were stated in a way that students' self of agency could be hindered. For example, wagging an index finger, one teacher sternly states, "Bad boy, I said there shouldn't be any patterning from the video." As student's weaknesses are routinely pointed out in front of the entire class, "You're usually weak on apostrophes." Within the same classroom, yet during a different lesson and in reference to a different student, the teacher condescends a student when there is general confusion about an assignment. One student asks, "What are the strands?" The teacher replies, "They were something you had to do yesterday. Oh (student name), you have to do that!" Immediately, the student reddened in the face, tears welled up spilling over her eyes,



and staring down at her desk her lip quivered. Within other classrooms, daily interactions were less severe and relationships were less strained.

Another teacher frequently spent his planning time helping students either on academic or personal tasks. One day, a senior boy worked with this teacher on composing a letter for a scholarship. At one point, the student complained that it was pointless to even finish the letter because he was not going to get the scholarship, “I’m 21 out of 24 in my class.” The teacher, without missing a beat, rebutted with, “I didn’t graduate with any honors and I got this job.” Within that short exchange before getting back to work composing and editing his scholarship letter, an effort was being made to foster and build up this student’s sense of agency. These daily, commonplace interactions assisted in creating the classroom climate. When critical literacy discussions arose, it was within these established environments, in which the affect of agency had either been nurtured or repressed.

### ***The Power Dynamic and Critical Literacy Pedagogy***

Based on the research of Dozier, Johnston, and Rogers (2006), the notion of power, who has it and who controls it within the classroom, is a key factor within critical literacy pedagogy. McLaren (2007) states, “Some forms of knowledge have more power and legitimacy than others” (p. 197). The concept of power was vital when considering the effect upon relationships within the classroom as a result of how critical literacy was instructionally delivered and/or fostered. Within the content area classrooms, on at least one occasion, text that had been read either on the Internet, in a textbook, or from a supplementary source had sparked discussion that encouraged critical literacy.

When there was the potential to promote critical literacy, the majority of occurrences resulted in the teacher presenting the viewpoint that would be discussed or talked about. During

these situations, the teacher controlled the direction of the lesson and the content that was legitimized. Thus, critical literacy was either hindered or the opportunity missed. For instance, during a lecture about Frankenstein, the teacher referred to the scene when the monster comes back for his creator asking “Who am I?” with the hands of a musician, the brain from a scientist, and the heart from another. The monster’s creator was playing God. The teacher then posed a rhetorical question to the class, “How far will we go playing God?” It was rhetorical because of how it was asked, phrased with inflection that made it almost seem like an argument, and without any wait time or invitation for students to respond. Rather, the teacher continued expressing her perceptions regarding stem cell research and genetically altering plants. This would be barely a discussion; hardly a portrayal of a situation, and overtly one sided.

Although less frequent, when the opportunity to foster critical literacy arose and was capitalized upon, viewpoints were multiple and openly discussed and debated. For example, after reading a poem from the Victorian era, a question from the study guide sparked discussion. The question read, “Would you help the man on the road?” One student made the connection that the man on the road from the poem would be similar to the homeless. This slanted the conversation toward homelessness in which students shared experiences they had when encountering homeless individuals. One student said that when in Indiana, someone from her group with whom she was traveling, “bought this homeless guy a Chinese dinner, because you know they will eat it.” Another remarked, “Some people say that they should just save their money, but it’s not like they can save enough to buy a house so whatever they want to spend it on to make themselves feel better, why not.” Before the dismissal bell rang another student stated, “A lot of those people don’t really do anything to help themselves.” This critical literacy

conversation was cordial, honest, and open, allowing for students to express their unique viewpoints without retribution.

Opportunities to promote and foster critical literacy typically occurred during teachable moments when a comment or question derived from text sparked the interest and passion of those within the classroom. Data findings support that critical literacy learning was occurring occasionally and at various cognitive levels within the content area classrooms. The data, however, revealed that critical literacy was not a dominant element within the classroom learning or instructional environment. In addition, there was lack of data to support the intersection of the technology associated with the one-to-one laptop initiative and critical literacy within the classroom and instruction.

### **Perceived Overall Impact of the One-to-One Laptop Initiative**

This research study elicited a variety of perspectives with a diversity of viewpoints regarding the one-to-one laptop initiative at Cardinal Creek High School. Those who have participated within the study (students, teachers, administrators, and parents) shared benefits and successes of the laptop initiative, as well as the challenges and drawbacks that have been confronted. Figure 4.9 illustrates the overall perception of the one-to-one laptop initiative by all participant groups. Data were derived from the compilation of survey responses and interviews.

Of the participant groups within the study, the data reinforced that although viewpoints and individual perceptions varied, overall there was sense of support for the one-to-one laptop initiative at Cardinal Creek High School, with the majority of participant comments and perceptions being positive in nature. Students, in particular, perceived the one-to-one laptop

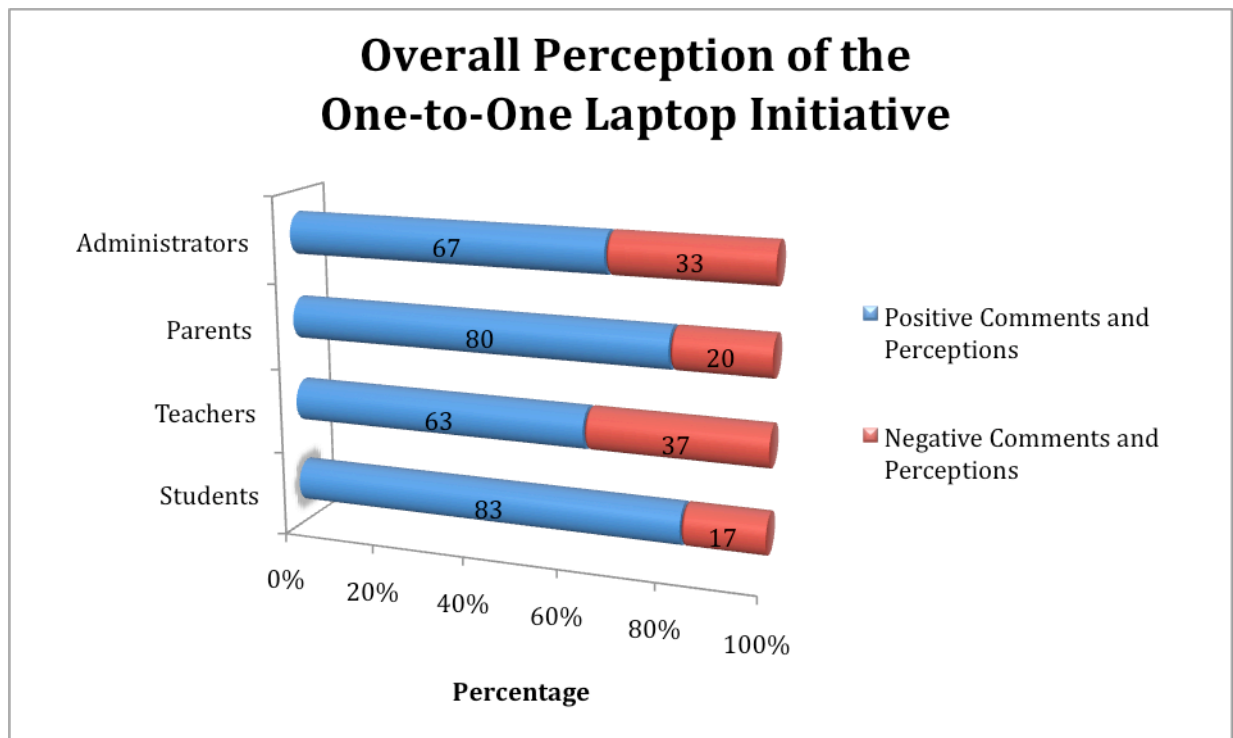
initiative positively, with a documented 83% of comments reflecting favorably toward the laptops. Some of the positive comments included:

*I think the laptops have gotten us more involved and interested in our schoolwork.*

*I think laptops are great to have. Some kids would never have the chance to work with this type of technology otherwise. Our world is turning more and more to technology everyday, so it's good to be educated about it.*

*For some reason it makes our school not seem so small. Maybe it's the Internet, I don't know.*

**Figure 4.9 Overall Perception of the One-to-One Laptop Initiative**



The parents who participated in the study ranked next in groups who overall supported and positively viewed the laptop initiative (80%). Parents stated:

*I think the one-to-one technology initiative at this time is an excellent one. It's a great learning tool as well as research tool that is available 24 yours a day for the students to access.*

*Before laptops, only those students who had computers at home were able to use them for school work, but now the playing field has been leveled so all students have equal opportunities.*

Comments and perceptions further illustrate that participants recognized the existence of a digital divide (Henry, 2007), but through this initiative the technological gap for students within the Cardinal Creek High School was lessening.

The teacher participant group reported the most variation in perceptions regarding the one-to-one laptop initiative with 63% viewing it positively and 37% expressing negative sentiments toward the laptops. Positive comments and quotations from teachers included:

*It has evened the socioeconomic playing field. All students have access to the technology.*

*We have at our fingertips very current information.*

*It is a lot easier to utilize the technology. Instead of working around schedules for the computer lab we can work in the classroom.*

Illustrative comments and quotations that expressed a more negative viewpoint included:

*Due to attention difficulties, the Internet is not always a good source. They (students) tend to get lost with so many choices and require lots of redirection.*

*Technology is a part of them. I think that the school is just trying to keep up with what the kids have going on anyway. I don't think that it's made them better problem solvers however.*

The administrator participant group reported similar data to that of the teacher participant group with 67% of administrator comments and perceptions being positive. For instance, positive perceptions were documented as:

*The laptop initiative has been good for our students and staff. It has allowed us a vital learning tool to be with our students at all times.*

*Kids are more excited about learning and more motivated. It's allowed our teachers more resources for learning.*

Thirty-three percent (33%) of administrator comments and perceptions reflected a response of negativity, such as:

*The educational value of the technology has not been capitalized on, but it is pervading all areas of Cardinal Creek High School.*

*Resistance (by the teachers, to the one-to-one laptop initiative) has turned to resignation.*

Figure 4.9 reinforces that while the one-to-one laptop initiative does present challenges to Cardinal Creek High School; overall, all participant groups recognize and perceive that the laptops are more of an asset than a hindrance toward instruction and learning.

The data presented within this section drew upon the findings highlighted from the previous sections within Chapter Four: (a) the one-to-one laptop initiative's technology utilization by participants, (b) the one-to-one laptop initiative's effect upon content area literacy, (c) the role of new literacies within the one-to-one laptop initiative, and (d) the role of critical literacy within the one-to-one laptop initiative. Data supporting and elaborating upon these findings were obtained through extended observations, individual interviews, tandem focus group interviews, and the collection of relevant documents and artifacts. To ensure due diligence in reporting data findings regarding participants' overall perceptions of the one-to-one laptop initiative, the remainder of this section has been subdivided into the subsections that include: (a) perceptions based upon levels of technology implementation (LoTi), and (b) perceptions of emic issues that arose.

### ***Perceptions Based Upon Levels of Technology Implementation (LoTi)***

The Cardinal Creek School District, specifically the Cardinal Creek High School, is a participating member of the LoTi (Levels of Technology Implementation) framework/connection. The LoTi scale was created in 1994 by Dr. Christopher Moersch (LoTi

Connection, 2008) to explore the role of technology within the classroom by evaluating: (a) a classroom teacher's level of technology implementation, based on the LoTi framework; (b) personal computer use, which measures a teacher's comfort and skill level with using a personal computer; and (c) current instructional practices, which measures a teacher's likelihood to conduct inquiry-based classrooms. The LoTi framework is a nationally validated assessment tool (LoTi Connection, 2008), and it aligns with the work and research of the Apple Classrooms of Tomorrow (Sandholtz, Ringstaff, & Dwyer, 1997).

In 1985, Apple Classrooms of Tomorrow conducted and reported research regarding a joint project between public schools, universities, research agencies, and Apple Computer, investigating how routine use of technology within classrooms affected teaching and learning (Sandholtz, Ringstaff, & Dwyer, 1997). Based upon this research, a scale of support was recommended for instructional advancement dependent upon where teachers ranked within their integration of technology. There were five phases of evolution in the scale: entry, adoption, adaptation, appropriation, and invention. Based upon this scale, the instructional evolution of most classrooms during typical lessons would be classified within the adoption phase, characterized by tasks that require keyboarding, the use of word processors for writing, and the use of computer-assisted instruction (software for the drill and practice of basic skills).

During one of their staff development sessions, the Cardinal Creek School District encouraged all faculty and staff to take the LoTi online survey. Each participating faculty member was able to login privately and responses remained confidential. Upon completion of the survey, individuals received a report highlighting both their technological strengths and areas in which they could strengthen. When logging into the LoTi Lounge, school district administrators could access district and school-wide data reports, yet individual responses

remained confidential. Those in a role to support and provide professional development were able to access the data necessary to guide decisions regarding professional development and determine areas that needed further strengthening. Table 4.2 illustrates overall data findings from the LoTi participant survey, which Cardinal Creek teachers completed.

**Table 4.2 Overall Levels of the LoTi Framework at Cardinal Creek High School**

	Mean Intensity Level
Overall LoTi Framework Level	2 <sub>1</sub>
Participant CIP - Current Instructional Practices	4 <sub>2</sub>
Participant PCU - Personal Computer Usage	5 <sub>2</sub>

Note: Intensity Levels range from 0 – 6. <sub>1</sub>  
 Intensity Levels range from 0 – 7. <sub>2</sub>

Level 2 in the overall LoTi Framework is categorized as exploration regarding the integration of technology into the classroom. Exploration at this intensity level is characteristic of technology tools that supplement the existing instruction and compliment current technology/multimedia/web-based projects at a knowledge and comprehension cognitive stage. Technology utilization at the exploration level is often utilized within the classroom for either extension or enrichment activities reinforcing knowledge and comprehension skill development. The CIP (Current Instructional Practices) intensity level of 4 is characteristic of instruction in which participants tend to structure student projects that are uniform for all and teach via lecture and/or direct instruction presentations with traditional assessment as the norm. The PCU (Personal Computer Usage) intensity level of 5 features individuals who demonstrate a ‘high skill level’ when using technology for their personal usage. Technology usage common for individuals at an intensity level 5 include tasks such as webpage creation, manipulation of most applications like those within the Microsoft Office Suite, desktop publishing software, web-



based tools, and general competence when troubleshooting most peripheral hardware and software problems.

Based upon this data, the Cardinal Creek High School was documented as evolving and progressing regarding the integration of the one-to-one laptop technology within classroom instruction. However, there was ample data that supported the stance that more still can be accomplished to effectively and efficiently utilize and integrate technology within classroom instruction and curriculum.

### ***Perceptions of Emic Issues***

While collecting research during the study, emic issues arose from classroom observations and participant comments. These issues, although not directly aligning to the research questions posed within this study, deserve attention and require consideration. The following are the two major emic issues that surfaced during data collection: (a) the one-to-one laptop initiative and classroom management, and (b) the one-to-one laptop initiative and personal interactions.

#### ***The one-to-one laptop initiative and classroom management***

Ms. Hamilton states, “Kids cheat or get on sites that they shouldn’t be on when they are supposed to be recording their phrase of the day. Some of the brightest kids will do this, too; it’d really surprise you. So I have to vulture over their shoulders.” “Pick your battles,” is the stance taken in the social studies classroom. Students come to class immediately opening their laptops. Teacher generated PowerPoints support lesson delivery while students are required to take notes upon their laptops from these PowerPoint slides. Mr. Smith states:

*I hardly ever have any student talking out in class, and you can usually watch their fingers and tell if they’re taking notes, and if not they might be only using one hand to*

*push the arrow keys (to play a computer game) . . . you just have to pick your battles, do you yell at this one kid, or do you just keep your other fifteen students on task taking notes?*

Students exhibiting off task behaviors within classroom settings were not unique.

However, how those behaviors materialized differed by student and by situation. With the implementation of the one-to-one laptop initiative, the array of possibilities for off task behaviors multiplied. For instance, during school hours at Cardinal Creek High School, emailing was prohibited unless the student received permission from the current classroom teacher. Therefore, the responsibility of what was perceived as acceptable classroom behaviors, and what was determined to be off task or unacceptable behaviors, rested upon the classroom teacher. Teachers' management of these behaviors varied drastically from classroom to classroom regarding what was acceptable, what was not, and how these range of behaviors were addressed.

Classroom occurrences were observed when the perception of the activities and behaviors taking place varied based upon the individual and their role within the classroom. For example, during direct instruction a teacher noticed a student using hot keys to toggle between computer screens (picture albums in iPhoto, Google, MSN email, and a new Word Processing document created for this class). Once the class had been released to work on their homework assignment, the teacher told a student his computer would be taken away if he had to be asked again to get back on task. Student intentions varied from situation to situation and classroom to classroom. When caught in this circumstance some students realized they were, "caught doing something they weren't supposed to." Another was quoted, "I think they (teachers) should be less concerned and trust us more to get our stuff done."

When asking students how they learn, read, and study best, students seemed to be very honest. Some preferred to work with background music, others agree but only when studying certain subjects, and yet others recognized that they need quiet and have difficulty remaining

focused with music playing. When discussing students' ability to multitask during classroom instruction, students again provided responses that seemed honest and in earnest. Students were reported saying:

*I tune out sometimes and if I get done typing and (teacher's name) doesn't say anything, I'll switchover, but most of the time I stay focused pretty well because he keeps you pretty interested.*

*When you're taking notes you can have an Internet window open and your e-mail and stuff, and in between slides you can look between those. It's kind of to keep you more or less occupied, like you're still doing something. It's kind of like time management doing something you need to do with something you have to do.*

Most students shared the sentiment that the amount of attention they give to the teacher and to instructional time within a class, "depends on the class, it depends on the teacher." When asked the difference, "It depends on how interactive they are with you when you're working on the laptop. Like we have some teachers who have assigned something and then just sit back and the back of the room and don't do anything and it doesn't make you want to do anything."

This emic issue surrounding the one-to-one laptop initiative's perceived impact upon classroom management is important to consider within the context of this study. It was sometimes difficult for teachers to move beyond these issues to clearly and reflectively consider how the laptop technology was potentially influencing classroom instruction, and student literacy skills, and overall pedagogical practices.

### ***The one-to-one laptop initiative and personal interactions***

Documented concerns arose regarding the perceived impact the one-to-one laptop initiative had upon personal interactions and developing relationships. At the beginning of this chapter a vignette was provided discussing a typical scene at Cardinal Creek High School before school. Within this scenario some student groups were talking together, others were working on their iBook laptops, and others might have been what one student called, "tuning out from the

world.” The perceptions of some students and teachers alike were that when some students were on their laptop, they would disengage and focus all their attention toward their laptop. One teacher noted afterschool one day that two boys were sitting next to each other on the bench in the hallway, silently typing on their iBooks. When she asked what they were doing, they looked up and said they were instant messaging one another. After sharing this story, the teacher remarked:

*I guess my big concern is, and I have talked to some of the other teachers about this, is the lack of verbal communication that we see sometimes. It's that kids would rather e-mail you than come up and talk to you. Of course, if it's a situation that they're not comfortable with, then it's a great way, and they have another outlet, but as far as being, in a sense, an advocate for themselves. But I do have concerns about the balance of utilizing the technology to help you, but also on the other side of that, there's less of that face-to-face kind of contact.*

The emphasis that continuously arose from discussions with teacher and student participant groups was the need for balance in regard to utilization of the laptop technology. There needed to be a balance between being able to communicate effectively face-to-face, and to be able to communicate competently via email and other social networking tools.

### ***Summary***

Chapter Four has presented the findings from the case study conducted at Cardinal Creek High School investigating their one-to-one laptop initiative. Data findings have been offered through graphs, tables, and vignettes regarding the one-to-one laptop initiative's perceived impact upon (a) content area literacy, (b) the new literacies, (c) critical literacy, and (d) the overall perceptions of participants within the study. Data support that technology, within the one-to-one laptop initiative, was utilized by student and teacher participants in a variety of ways. The laptop technology was also employed through a range of pedagogical implementations. Through data collection related to content area literacy, findings were reported regarding textual

formats and modes, as well as overall instructional occurrences related to content area literacy pedagogy. The role of the new literacies was examined, and data were reported regarding how the new literacies were implemented within different content area classrooms: including language arts, mathematics, science, and social studies. So too, was the role of critical literacy examined within the one-to-one laptop initiative, reporting findings regarding how teachers fostered an attitude of agency within students, and the resulting power dynamic within critical literacy pedagogy. The study eventually resulted in data that documented the perceived overall impact of the one-to-one laptop initiative. Within Chapter Five, overall findings, conclusions, implications and research, teaching, and professional development recommendations based upon these findings are further discussed.

## **CHAPTER 5 - Discussion, Conclusions, and Implications**

This chapter presents an overall discussion of the study, its conclusion, and the implications for the research and data collected within this study, and research and educational implications based upon the findings. To organize the information discussed and presented within this chapter, the chapter has been divided into the following subsections; (a) summary of the study, (b) discussion of findings, (c) conclusions, (d) implications, and (e) summary.

### **Summary of the Study**

Technology integration within teaching and learning is a topic generating much discussion. Who has access to the technology and how the technology is utilized creates the digital divide. However, through innovations, like the one-to-one laptop initiative within this study, the digital divide of access to technology is becoming minimized. Yet the question still remains - How is laptop technology being utilized for instruction and learning? NCTE (2007) posits that educators need to encourage students to “engage with a technology-driven, diverse, and quickly changing ‘flat world’” (p. 1). Moving into the 21<sup>st</sup> century, students require the literacy, critical thinking, content-based, and technological skills to successfully thrive within a global society.

The purpose of this study was to explore how a one-to-one laptop initiative in a rural high school has been infused into content area classrooms, thus revealing how content area literacy was being taught, how the new literacies were being utilized, and how critical literacy was being fostered within participating content area classes. This study contributes to the current literature, as concrete evidence was gathered and reported while delineating how the one-to-one laptop

technology in the high school being integrated into learning and instruction through a literacy lens through content area literacy, the new literacies, and critical literacy.

This qualitative case study investigated the one-to-one laptop initiative within a rural high school setting. Study participants were varied including students, teachers, administrators, and parents of Cardinal Creek High School. Data were collected between February 11, 2008 and May 10, 2008 via extended classroom observations (approximately 85 hours), fieldnotes, teacher and administrator individual interviews (approximately 10 hours), student group interviews (approximately 2 hours), and documents and artifacts. Data were then analyzed through a blending of direct interpretation and categorical aggregation. As a result, through the crystallization (Richardson, 2000) of multiple data collection sources and various participant perspectives, a more complete understanding of the case study was derived. Data findings resulted in the exploration of: (a) the one-to-one laptop initiative's technology utilization by participants, (b) the one-to-one laptop initiative's effect upon content area literacy, (c) the role of the new literacies within the one-to-one laptop initiative, (d) the role of critical literacy within the one-to-one laptop initiative, and (e) the perceived overall impact of the one-to-one laptop initiative.

## **Discussion of Findings**

The data reported within Chapter Four are discussed and synthesized within this section. The discussion of the findings are organized by research sub-questions, connected to the existing research knowledge base, and focused toward the overall research question.

### ***How has the one-to-one laptop initiative's technology been utilized by participants?***

As in a previous study of one-to-one laptop initiatives (Silvernail & Lane, 2004), there remained an interest to determine how the laptop technology is being utilized within other

schools. This study supported the findings of the Maine Learning Technology Initiative (MLTI), in that teachers utilize the laptop technology mainly to plan and prepare lessons and instructional material, and to communicate via e-mail. While student's utilization of laptops to search for information supports previous findings (Silvernail & Lane, 2004), the diversity in activities, functions, and purposes in which students utilize the laptop technology has developed into expanded findings. Taking notes was a utilization of the laptops that was recorded as the most frequently occurring activity in the current study. The findings of the California's Fullerton School District Laptop Program (Warschauer & Grimes, 2005) also reported that taking notes was a mode in which students utilized the laptop technology at the school. Although taking notes might be considered a simple task, it was revealed as a useful, practical, and important skill to acquire.

Through extending the avenues further than survey research to also include data collection through observations and interviews, more detailed data were derived regarding technology utilization. Therefore, this current study's findings moved beyond documenting how the laptop technology was utilized solely for academic purposes, thus determining more overall usage regarding laptop technology. Findings from this study suggest that students utilize laptop technology associated with a one-to-one laptop initiative in the school setting for a variety of purposes - academic, recreational, and personal. Data documented students' utilization of laptops for academic purposes as:

- Conducting research,
- Completing assignments and homework,
- Generating "creative" projects,
- Writing reports/ papers,



- Creating PowerPoints, and
- Taking notes.

These academic purposes encompassed the functions and activities that aligned with instructional tasks of teacher's within their different content area classrooms.

Students' employment of the one-to-one laptop technology for personal efficacy purposes included:

- Emailing,
- Organizing personal affairs, and
- Checking grades.

The laptops have given students the tools to maintain and organize more individualized activities and tasks. Students have taken ownership with the laptops that have been checked out to them, personalizing them to be able to most efficiently and effectively access software and tools necessary to fulfill their personal and academic needs and styles. For instance, observations revealed setting alarms and notices to alert them to upcoming tasks, setting font sizes and color schemes to facilitate ease in reading, personalizing function keys and hotspots to make navigation within the space of the laptop efficient, and bookmarking frequently visited or important websites for easy access. Therefore, the laptop technology of the one-to-one laptop initiative is more than just a tool utilized for academics; it is often personalized to uniquely support and facilitate student's work, learning, and functionality.

Even though the iBook laptops were district issued, students were able to utilize and take them home as if they were their own. Therefore, students were documented as utilizing the laptops for recreational purposes, such as:

- Surfing the Internet,

- Playing games,
- Watching videos,
- Downloading and editing pictures, and
- Listening to music.

These recreational purposes were neither non-academic, not geared toward pedagogical practices, nor instructional activities within or outside of the classroom.

This study has contributed to the growing research base regarding how students are choosing to utilize the technology of the one-to-one laptop initiative. Through the development of categories for how students access and engage the Internet, whether to conduct academic research or to surf the Internet for information, more is being discovered about the heightened self-awareness that students have regarding their deliberate actions and learning. This dichotomy also encourages additional reflection concerning what research is deemed valid and worthwhile. When given a directive by the teacher, students recognized their searching on the Internet as that of conducting research. However, when looking at specifications and pricing the cost of a new alternator for his car on the Internet, the student perceives these endeavors as surfing the Internet. The connotation for surfing the Internet is one of aimlessness, un-directed probing and clicking, and while this may sometimes be valid, it is not always the case.

This study also supported the professional growth and development regarding how teachers utilized the technology afforded by the one-to-one laptop initiative. Maintaining, yet moving beyond utilization for communication and lesson planning and preparation (Silvernail & Lane, 2004; Warschauer & Grimes, 2005), teachers from this case study were documented as employing the laptop technology to manage and organize their courses and maintain their

records. Teacher usage of the technology associated with the one-to-one laptop initiative was reported to include:

- Utilization of content specific software/programs,
- Lesson planning and preparation,
- Moodle, a free online course management system,
- Email
- Internet searches, and
- Power School, a district specific, closed-system, web-based repository accessible to its members – district teachers, parents, students, and administrative staff.

Aligned with the research conducted by Warschauer and Grimes (2005) regarding the utilization of technology by teachers, findings from this study support that teachers were employing the laptop technology within classroom instruction.

In addition to supporting the existing research regarding how teachers utilize the one-to-one laptop technology, through the extension of teachers' usage for course management tools, and specifically Power School, more traditional inter-school communications and data repositories are evolving. Paper attendance slips are no longer; by teachers entering in their attendance into PowerSchool, on an hourly basis, administrators, administrative personnel, parents, teachers, and students have access to this information. If a student is behind on his/her lunch card payments, an email will automatically be forwarded to the student, parent, and administration, thus helping to maintain accurate records with minimal efforts. Through streamlining administrative procedures and accelerating the transfer and access that all have to the information and data, workloads are lightened thus time can be devoted toward other tasks and responsibilities. The communication of grades may be one of the most regularly viewed and

highly employed features within these course management systems. Since students can access their current grade and status within their courses, they are provided with more autonomy for their success within their classes. Parents alike do not have to wait until grade cards come out or parent teacher conferences to gauge the success of their student within individual classes. Contact with this information is instantaneous and available from anywhere that is Internet accessible.

As a result of the one-to-one laptop initiative, there are resulting implications upon *how* the technology is infused within pedagogical practices and daily instruction. Laptop utilization within, and related to, instruction was documented as including:

- Student generated PowerPoint presentations,
- Teacher generated PowerPoint presentations,
- Note taking,
- Homework and assignment completion, and
- Academic research.

Supporting the findings of Warschauer and Grimes (2005), when using laptops to conduct research within instruction, the findings can be disaggregated based upon purpose for accessing that information: (a) finding information for projects/assignments, (b) facilitating “just in time” learning, and (c) stimulating student’s schema and background knowledge about curricular content. This study extended these findings through documenting extended categories of technology utilization and the frequency upon which these purposes were employed. Within this study’s setting, the dominant purpose, to conduct research, was in order to find information for projects/assignments.

***How has content area literacy instruction been effected as a result of the one-to-one laptop initiative?***

Content area literacy instruction within the one-to-one laptop initiative builds upon the work of Vacca and Vacca (2002), in which content area literacy is the reading, writing, and literacy that takes place across the curriculum and within each content discipline. Data findings and discussion center on content area textual formats and content area instructional practices.

*Content area textual formats and modes.* Sweeney (2007) states, “By utilizing multi-modal texts that capture the interests of students and give them an opportunity to feel successful as readers, perhaps they will remain turned on to reading and engaged in the learning process across all content areas” (p. 21). This may be true within some cases and in certain situations, but the findings of this study reveal that outcomes of utilizing multi-modal or digital texts is dependent upon how the teacher’s instruction, and how the content and material is technologically presented and delivered. The laptops within the one-to-one initiative had a perceived impact upon:

- the search for information and content,
- the connection between the text and the reader, and
- the support and adaptations for struggling readers.

Within the science classroom, the laptops, within the one-to-one laptop initiative of this study, provided an opportunity for students to access and search for information and content with ease and readiness. With the availability of the science texts downloaded onto the laptops paired with their access to the Internet from anywhere within the school, students had the unique ability to be able to search for information and content. The option for students and teachers to hyperlink within the digital textbook and to relevant webpages allowed for individuals to search for

information and content necessary to increase understanding, comprehension, “just in time” learning, and expand background knowledge. However, explicit instruction from Ms. Thompson regarding how to manipulate and read the digital text within her content area was not documented within this study. Conversely, in the social studies classroom, Mr. Smith was observed routinely supporting students within their reading tasks, and information and content searches. For example, through Internet scavenger hunts, students worked independently or in cooperative groups to search and locate information relevant to current content area concepts.

Overall, students within this study reported mixed perceptions regarding the digital textbook they had for their science classes. The textual features and navigation tools it possessed were beneficial for some and an annoyance or hindrance for others. With little to no explicit support regarding utilization of the digital textbook, it was common for students to rely upon the more familiar hard copy text. This finding can be further exemplified within the following exchange between students:

*Student 1: I'd much rather have them (textbooks) on laptops than on hard copies.*

*Student 2: Really? I'm the other way.*

*Student 1: I hate carrying books around, why carry books when you can just carry a laptop you can have all your books on your laptop.*

*Student 2: I'm the opposite.*

*Student 1: I think they (digital textbooks) are easier to read. You can zoom in on them as much as you want to make it easier on your eyes. You can listen to your music while you read.*

*Student 2: Everybody likes their own way.*

Due to the immediate ability to access the Internet from their seats, student and teachers were provided with instant access to current content information. This feature was positively praised, supported, and employed by all participant groups within the study. Students reported stating:

*It's a lot more fun . . . you can look stuff up faster.*

*I like that it's easy to find things.*

Due to the vast quantity of information that is available via the digital nature of texts and afforded by the one-to-one laptop initiative, the potential exists for a sizable throughput of information and content that is addressed, taught, and learned within content area classes. Rather than taking the time to go to the library and locate information that may or may not be accessible, students, from their desks, can access the Internet and instantaneously be offered one or more sources in which to locate and find the required information. When discussing library traffic, the librarian stated, “The research part of it has changed probably the most dramatically. . . There’s not as much research going on.”

*Content area instructional practices.* As a result of the findings, data supports that the majority of the content area literacy instructional practices happened after the reading tasks, a minimal portion of content area literacy activities occurring prior to reading or during the actual reading assignment. This supports that there is minimal explicit instruction from teachers taking place within content area classrooms. Of the documented content area literacy instructional practices, there were two main categories: vocabulary development and comprehension activities.

Based upon the foundations of content area literacy instruction (Vacca & Vacca, 2002), this study supported that content area literacy parallels instructional activities and tasks requisite to support successful content knowledge, through instructional literacy strategies. A dominant portion of instructional literacy support was provided through tasks and activities associated with vocabulary and concept development. For example, Ms. Hamilton, the language arts teacher, talked and discussed with the class as a whole regarding irony. Definitions were provided for

verbal, dramatic, and situational ironies, followed by specific examples that accurately portray each form of irony. Within a different content area, the mathematics classroom, Ms. Apple fostered vocabulary and concept development through mnemonic support. For instance, when working with students regarding how to read graphs, Ms. Apple utilized the mnemonic, “You Have Xray Vision.” YHXV, stood to remind students that the y-axis was the horizontal line, and the x-axis was the vertical line.

The other significant portion of instructional occurrences dealt with post-reading activities aimed at assessing the retention of content from the reading. Again, when referring to the instruction devoted toward comprehension tasks, most were documented as content and concept comprehension versus supporting and facilitating reading comprehension. Draper, Smith, Hall, and Siebert (2005) tout that students require explicit instruction from teachers regarding how to read, negotiate, and comprehend content texts. This study’s findings support that more methods can and should be designed to capitalize upon the literacy skills and competencies of students when reading and interacting with content area texts.

***What has been the role of the new literacies as a result of the implementation of the one-to-one laptop initiative?***

Supporting the conceptualization of the new literacies (Leu, Kinzer, Coiro, & Cammack, 2000), this study sustains the stance that the new literacies of the Internet and other ICTs include skills and strategies to successfully utilize, negotiate, and foster proficiency within the environment of new literacies. These include the ability to: (a) identify questions, (b) locate information, (c) critically evaluate the usefulness of information, (d) synthesize information to answer questions, and (e) communicate the answers to others. As a result of the presence of the laptop technology within classrooms and in possession of students and teachers on a daily basis,



the new literacies were consistently addressed. Skills that fostered these new literacy aptitudes occurred typically when research was required, or when a spontaneous teachable-moment arose that benefited from students having the strategies necessary to successfully employ the new literacies of the Internet. The key principles of which the new literacies perspective are based (Leu, Kinzer, Coiro, & Cammack, 2000) are subtly addressed within this study, thus supporting the grounding of this emergent theory.

*The Internet and other ICTs are central technologies for literacy within a global community in an information age.* The ability for students at Cardinal Creek High School to instantly access information via the Internet and World Wide Web enables information retrieval from a global community. Teachers' access to the Internet and the ability to locate and share information regarding lesson plans and instructional activity ideas also place Cardinal Creek High School teachers within a global community. The sheer location of Cardinal Creek High School, makes it somewhat isolated due to its rural nature. Yet due to the Internet and the ability to connect to information and others, one student stated, "it makes our school not seem so small."

*The Internet and other ICTs require new literacies to fully access their potential.* When utilizing the new literacies, data support that certain skills, strategies, and dispositions are required to effectively and efficiently navigate the Internet. Findings suggest that there is not necessarily a balance between or within these new literacies skills. Students from this study demonstrated their competence within the realm of the new literacies when asked to locate and download graphing software, or when asked to determine our current national debt; however, there remained a strong emphasis overall on demonstrating the ability to locate necessary

information on the Internet. During this study, these new literacies skills were not explicitly taught; however, within some situations they were fostered, practiced, and encouraged.

*New literacies are deictic.* As the relay of information and literacy practices evolve, so does the technology that supports them. The implementation and integration of YouTube videos as an educational tool to disseminate content knowledge supports this principle. The *My Trig* video incorporated visual input and aural support within the lyrics to present mathematical concepts. While the message was academic and conceptual, however, the delivery of the message was grounded in pop culture, the tune, the videography, and the style.

*The relationship between literacy and technology is transactional.* Many of the creative assignments that were given to students to complete were grounded within the transactional relationship between the technology utilized and the literacy employed. For instance, for a music appreciation assignment, students created and performed an original music score for a movie scene that they wrote. Within this assignment, students moved beyond linear thinking and expression in order to articulate their appreciation in a rich, complex, and multimodal fashion (Kist, 2005).

*New literacies are multiple in nature.* Again, through multimedia projects as the one just described within the music appreciation class, the principle that the new literacies are multiple in nature was supported. In addition, throughout many occasions during the study, students created PowerPoint presentations expressing their synthesis of knowledge regarding a topic or concept, derived from both traditional textbooks and Internet websites. Within these PowerPoints, visuals were frequently used to support the written content on the slide, or the written content was included to enhance the visual representation of content. Thus, multiple avenues provided within the PowerPoints, allowed the dissemination of information through multiple modalities.

*Critical literacies are central to the new literacies.* Anytime students' accessed information on the Internet that was valid and legitimate, they were demonstrating their critical literacy competence. There were instances, however, in which Wikipedia was drawn into question. Some teachers were skeptical and cautious of this site since authorship can come from anyone, anywhere. However, many students would begin searches for information here, then hyperlink to other sites. It is within this phase of the search for information that students had to read critically to determine the validity and legitimacy of these websites and sources.

*New forms of strategic knowledge are central to the new literacies.* As illustrated in the aforementioned situation in which students employed Wikipedia as a starting place to search for information, students were being strategic with how they locate and discern relevant information. Within Wikipedia there are hyperlinks readily available to connect the reader/researcher to related information. This utilization of hypertext supports how students were able to effectively locate, evaluate, and use the extensive array of resources and information (Reinking, 1997). In addition, the digital texts within the science courses also provided hyperlinks between sections of text and the Internet encouraging the successful utilization of texts, technology, and developing knowledge base.

*Speed counts in important ways within the new literacies.* The findings from this study support that when researching on the Internet, a substantial portion (31%) was for facilitating "just in time" learning for students. For example, at the end of class one day, students were discussing who would be performing at the Kansas State Spring Game. One student was unfamiliar with who Rod Stewart was, so he Googled the performer, found a sound clip of one of his songs and played it while asking the others in the conversation if this was Rod Stewart.

When this need arises, the ability for students to quickly access the information they require is vital; otherwise the “just in time” characteristic of this learning is missed.

*Learning often is socially constructed within the new literacies.* There were limited documented occurrences of true socially constructed learning and collaboration. However, there were some instances in which students themselves sought out the help and collaboration of others. For instance, while working on their senior projects for the language arts class, two students subtly relied upon each other’s knowledge to enhance their overall understanding (New London Group, 1996). Sitting next to one another, they independently worked on their PowerPoints. When one student turned to his neighbor and asked how to perform a particular formatting function within the software program (Excel), the neighbor was not completely sure. But he did share what he had accomplished previously, and suggested accessing to the online help available. Both students accessed the online help, temporarily working together collaboratively to solve this dilemma. This illustration of how, through social constructivism (Vygotsky, 1978) and collaboration, students are able to learn more when individualized information can be juxtaposed in order to enhance the existing knowledge base of both parties.

*Teachers become more important, though their role changes, within new literacy classrooms.* When skills and dispositions associated with the new literacies were employed within the classroom setting, the teacher’s role transitioned into one of a facilitator and supporter. For example, during the economics lesson, the teacher guided and supported students as they searched for the current national debt statistics. He did not directly instruct them on which website to access, or which search engine to use; rather, he provided scaffolds and guidelines while becoming another resource from which students could extract information.

***What has been the role of critical literacy within classrooms with the one-to-one laptop initiative?***

Based upon the research of critical theorists (Freire, 2007; Giroux, 1987; McLaren, 2007) and the work within the field of critical literacy (Dozier, Johnston, & Rogers, 2006), this study realized the limited opportunities and occurrences of critical literacy. Readily available laptop technology allows for ease in access to the Internet and World Wide Web, in which being able to critically discern valid, pertinent, and legitimate information is crucial (Leu, Kinzer, Coiro, & Cammack, 2000). This ability to read critically was a much more commonly regarded skill within the study. Yet over half of the teachers perceived critical literacy and critical reading as independent of technology associated with the laptops, rather than integral components. Viewpoints such as these seem to infer that there are particular methods or techniques in which to foster and support critical literacy and critical reading.

Johnston (2004) supports that students require an attitude of agency for true critical literacy. The data from this study report mixed findings regarding the agency being fostered within students. The willingness to take risks, valuing mistakes, and seeing the resulting learning that emerges was not always supported or received well during instruction. For instance, during class students take turns reading *MacBeth* attempting to read with proper stress on syllables and in correct rhythm. Many students struggle while reading, but as one student is having considerable difficulty, Ms. Hamilton states, “Everybody, can you agonize along with him to try to figure this out?” The key portion of this question, that makes it inhibitive regarding student agency, is the usage of the word *agonize*. Once the question was uttered, the student who was *agonizing* turned red and became noticeably embarrassed. Interactions as this inhibit the potential for growth of the self’s sense of agency. At other times and in other situations, a “can

do” attitude (Dyson, 1999) was encouraged, promoted, and fostered; consequently, allowing students to struggle and sustain within their zone of proximal development (Vygotsky, 1978). For example, within a science lesson on erosion, Ms. Thompson poses the question to students, “What do we do to make the ground unstable?” Some students within the room offer their explanations, some are aligned with what Ms. Thompson was aiming, whereas, other responses were not accurate. Toward these students, Ms. Thompson employed a gentle remodeling approach so that students were not discouraged from volunteering their comments. It was within frameworks such as this that students took risks and maintained a sense of self-agency.

“Some forms of knowledge have more power and legitimacy than others” (McLaren, 2007, p. 197). Findings from this study supported this position. How perspectives and viewpoints are presented, discussed, or debated within the classroom can allude to or imply that certain knowledge or views are more legitimate or valid than others. Overall, when confronted with an opportunity for critical literacy instruction or pedagogy, teachers more often than not maintained the more traditional paradigm of *delivering* the curriculum/perspective *to* students (Lyons, Pinnell, & DeFord, 1993). However, when the teacher moved aside from being the most knowledgeable in the classroom, empowering students to exercise their perspectives and viewpoints, students did capitalize upon these instances. For example, within the language arts classroom, a student is facilitating the discussion on the poem, *The Sniper*. This student relates the content to what is currently happening in the war in Iraq, opening up the floor for other students to participate within conversation.

***What is the perceived impact that the one-to-one laptop initiative has had on teacher instruction and enhanced student learning?***

In answering the overall research question related to this case study, the perception of the one-to-one laptop initiative was positive, the potential of the technology associated with the one-to-one laptop initiative was clearly articulated within this study. There is a definite sense that the perceived impact the one-to-one laptop initiative has had on teacher instruction and enhanced student learning is based upon and grounded in specific contexts, situations, and occurrences. Depending on the individuals involved and the context of the situation, perceptions of the laptop technology could be favorable or unfavorable.

*Teacher instruction.* There was an overall positive perception regarding the impact the one-to-one laptop initiative has had on teacher instruction. Participants perceived the impact of laptops within instruction as beneficial, the laptop technology:

- Increased content productivity,
- Increased professional organization, and
- Facilitated exposure to content via multiple formats.

In reflecting on how the laptop initiative has impacted his teaching, Mr. Smith states, “I definitely would not have been able to get through as much material as I have been able to without the computers.” Students are able to take notes on their laptops facilitating the ease and speed with which students can follow the delivery of content. Ms. Apple reinforces this comment when stating, “Technology allows you to have a lot more distance. Where you can Google just about anything and find a lot of information in that opportunity.” In addition, through the usage of laptops, teachers are able to create, store, retrieve, and access lesson plans, materials, curricular content, and instructional activities and examples with ease and fluidity; thus, increasing instructional and professional organization. Finally, through the utilization of laptop technology, teachers are now able to expose and present material to students in multiple

formats, working to increase student retention of content and information. Mr. Smith states, “With a laptop, and with PowerPoints, and different things like that, more technology allows each kid to find their own little niche on how they want to learn.” Ms. Apple reflects:

*Those (students) who start out already doing well will end up doing well in direct instruction, the kids who are already analytical and are school-minded. So what of the other group? I believe it is in these other constructive methods, for instance, like project based learning, which helps us to allow all of those other kinds of learners those opportunities . . . to access the information and process it in their own way.*

However, not all perceptions were positive, since some participants viewed the one-to-one laptop initiative as more of a negative influence on instruction. Some students perceived the laptops as a way in which teachers could minimize their instructional efforts. One student was quoted saying, “Sometimes I feel like teachers might rely on the computer to teach us, rather than them teach us themselves.” Another key concern when considering the perception of the laptop technology with regard to instruction was its limitation as a tool, thus not capitalizing on its potential. One teacher shares, “I think it’s (the laptop technology) is well intentioned, I don’t think it’s well administered and well applied.”

During conversations with participants within the study, comments inevitably positioned together two concepts. Instruction and learning within the one-to-one laptop initiative were discussed as interrelated and dependent upon one another.

*Instructional enhancement of student learning.* The perceptions of the laptops, within the one-to-one laptop initiative toward student learning were overall favorable. Participants viewed the laptop technology as:

- Preparing students for the future,
- Fostering better organization, and
- Exposing students to greater information, and content.



During an interview with Cardinal Creek High School's principal, he remarks:

*I think that our kids are going to walk out of here after four years and have a very good understanding of just how to manipulate the computer, how to get on the Internet for research reasons, for using Word and Excel, for saving data and organizing electronic files and things like that. I think they will be ahead of kids that don't have the laptop in their hands all the time.*

Ms. Thompson states, "They can save it (notes, assignments) so it doesn't get lost. So organization is a big thing." Students can take notes electronically, complete assignments electronically, and save all content area materials within folders on their desktops. However, since material is saved electronically, students must learn to backup and save files in multiple locations. One student satirically recalls this reality after losing all of her files in what she refers to as the "computer crash of 2008."

However, the one-to-one laptop initiative was perceived negatively by some and within particular instances. Two of the most frequent and dominant concerns of teachers and administrators were student's ability to remain accountable for their learning and maintaining on-task behaviors. It can be "frustrating" for teachers because interaction on all laptops cannot be monitored at all times. Ms. Thompson states, "I've almost given up," just because students are supposed to be taking notes, they could be playing games or surfing the Internet. One teacher has resorted to "vulturing over their shoulders" so that she can maintain more control in what students are accessing and doing on their individual laptops. When confronted with this concern, one student verbalized succinctly what many expressed, "I think they (teachers) should be less concerned, trust us more to get our stuff done."

Findings from this study implied that instructionally more could be done to fully capitalize upon the technology available within the one-to-one laptop initiative. Teachers could capitalize on how they choose to utilize the laptops within instruction. Students could employ

the laptop technology in a way that instilled more confidence by teachers within them. However, there is an overall perception of positivity for the one-to-one laptop initiative, and there is dedication by all participant populations to ensure the success of this initiative.

## Conclusions

As a result of this study, several conclusions can be drawn from the findings that contribute to the current research knowledge base. The conclusions presented include:

- the essence of the digital divide,
- the need for pedagogical professional development in association with technology utilization and integration, and
- the uniqueness of the act of teaching and the process of learning.

Within this section, each of these conclusions will be expounded upon and explained further.

The digital divide has moved beyond the linear and binary stance of the “haves” and the “have nots;” the issue truly has expanded to not only *who* has access, but *how* the access is being utilized, and *what* skill base is employed as a result (Henry, 2007; Valadez & Duran, 2007).

Cardinal Creek High School has bridged the gap between the “haves” and “have nots” regarding access to the technology. However, there is still a divide between how the technology is being utilized and the requisite skills necessary to employ the technology. Ms. Hamilton shares, “I don’t think that it’s (the laptop technology) making my instruction better. I see it as a tool you can add some more visual things.” Within this classroom, the laptop technology is one of many instructional tools from which to choose, thus maintaining the old wine in new bottles adage.

For example, during a lesson in which students were working on their senior project PowerPoint presentations, students were instructed to storyboard their slides onto photocopied paper of framed slides. This utilization of the laptop technology is illustrating its purpose as a tool, not as

an educational instrument from which to learn. This research demonstrates that access to current, cutting edge technology does not necessarily imply or ensure that the technology will be utilized, let alone capitalized upon. Participants within this study recognized that this initiative supported the elimination of the more traditional divide concerning physical access to technology. However, there is still the issue of how the technology is integrated within instruction and pedagogy, and how students are being encouraged to interact within the realm of the technology.

In order to close the pedagogical gap regarding technology integration within instruction, how it is utilized and what skills are being encouraged, professional development opportunities need to address these issues. McGrail (2007) stressed that it was necessary to emphasize, “pedagogy before technology, rather than technology before pedagogy, to help teachers constructively re-envision . . . technology in their classrooms” (p. 83). The findings from this study support this statement and the research base promoting the need for professional development to not just focus on tools and ways to utilize the technology, but how to pedagogically implement and infuse the technology within curriculum and instruction. The Instructional Technology Coordinator stated, “If there was one thing I could change about the way we did it (implement the one-to-one laptop initiative), it would be to provide more guidance and staff development for the teachers.” Some teachers felt as though they were “cast adrift” and what they did learn or what professional development that was provided was “supposed to be done on our own time.” This need for pedagogical professional development as it related to the one-to-one laptop initiative was a thread that was consistently woven throughout the study.

The act of teaching and the process of learning are unique and individualized to persons, places, and situations. Within Cardinal Creek High School, each content area classroom

approached instruction uniquely, and each content area teacher choose to utilize the one-to-one laptop technology distinctively. It is necessary to realize the individuality of teaching and learning; this is even more relevant when factoring in the technology of a one-to-one laptop initiative. For occurrences in which the one-to-one laptop technology initiative was successfully and skillfully employed within teaching and learning endeavors, there are occasions documented of missed or failed opportunities within instructional practices and learning enterprises.

### **Implications**

As a result of this research study, there are several implications that can be made regarding; (a) further research endeavors, (b) considerations for administrators and those affiliated with organizing and providing technology professional development, and (c) suggestions for teachers to enrich their instruction when integrating technology. Within this section, specific implications and recommendations will be provided and elaborated upon to support the continued and ongoing development of current research, professional development, and instruction.

### ***Research***

In addition to answering questions that were posed regarding the one-to-one laptop initiative's perceived impact upon content area literacy, the new literacies, and critical literacy, this case study posed several ancillary issues that would benefit from further research. Some of these researchable strands could extend the current line of technology and literacy research. Other recommendations for research emerged during the current study, and through further investigation could enhance and extend the existing research base.

### ***Best practices of teachers within schools of one-to-one laptop initiative programs***

This research study explored one high school's implementation of a one-to-one laptop initiative program. Multiple classrooms were observed throughout data collection and the laptop technology was observed being utilized for a multitude of academic, personal, and recreational activities; however, the overall integration of the laptop technology plateaued within this study. The district's Technology and Instructional Coordinator recognized this and stated, "I don't think that we have capitalized on it (the laptop initiative), and there's always going to be more we can do, and room for improvement, but I just feel like we have barely scratched the surface."

It would be prudent to identify classrooms and teachers who are considered by their colleagues, administrators, students, and parents as exhibiting exemplary integration of technology into instructional practices. Through a similar setting of a one-to-one laptop initiative, technology access and availability would be parallel. Upon identification of participants, the current study that was conducted could be replicated in order to determine some of the best instructional practices teachers utilize when integrating technology within their content area instruction.

### ***Replicate the current study with a well established one-to-one laptop initiative program***

The current study addressed the perceived impact the one-to-one laptop initiative had upon the literacy practices within the school; however, Cardinal Creek High School was only embarking upon its third year of the initiative. It would be interesting to replicate this same study within a school that had a more established program. To research how their program had evolved over the years, what issues arose over time, how integration of the technology was infused within classrooms, how the initiative had changed or progressed, and what they had

learned over the years about implementing a one-to-one laptop initiative would provide essential insights into the emergence of laptop technology and literacy. This researchable avenue could provide unique insights simply due to the time-lapse experience and lessons learned by participants, in addition to the research agenda to probe for further specific and detailed data. Another extension to this same research recommendation would be to revisit Cardinal Creek High School within five years and replicate this current study to determine what changes, progress, or issues have arisen since the completion of this study. Thereby, a longitudinal study could be established to determine growth over an extended period.

### ***Pedagogical philosophy and the integration of technology***

While collecting data for this study, an issue that subtly emerged was the perceived impact teachers' pedagogical philosophies had upon *how* the one-to-one laptop technology was integrated within their instruction and daily teaching. Different teachers seemed to exhibit various pedagogical frameworks and stances that interplayed with how they chose to integrate the laptop technology, how they managed that integration, when they chose to integrate technology, and with what regularity. It would be interesting and practical to further investigate how technology integration within instruction aligns to an individual's pedagogical philosophy of teaching.

### ***Legitimate knowledge in technology integration***

Another interesting data finding surfaced regarding what constituted and was considered legitimate knowledge within the classroom, when utilizing the laptop technology. As this study's finding illustrated, student participants considered "surfing the Internet" was not the same as "doing research" via the Internet. Why is looking up specifications of automobile motors not as legitimate as finding information about literature during the Victorian era? There

were times in which the search for particular information was not necessarily appropriate due to the content and/or activity of the lesson. However, there is more of an emphasis on research through the lens of fostering agency within students and validating their interests, concerns, and queries.

Therefore, it would be productive to investigate how legitimate knowledge is specifically addressed and approached within a technology-rich academic setting. A new study could explore what students, teachers, administrators, and parents consider legitimate and valid knowledge, and how that perpetuates or inhibits the critical literacy of students, their sense of agency, and their ability to affect change.

### ***The role of technology on the ability to multitask and attend to information***

Within this research study, there was the tendency for students to activate multiple applications on their laptops with several windows open simultaneously. Some students reported that they opened specific applications at the beginning of the day and these programs remained open and running throughout the day. During observations it was straightforward noticing students who would use hot keys or their function keys to rapidly toggle between different screens they had activated. This was a regular occurrence before class, during lessons, and after instruction. Some students claimed that they could multitask and remain attuned to what was happening within the lesson; other students honestly stated that they would toggle between screens, but were not able to attend to what was happening in class.

This ability for some digital natives to attend to multiple stimuli at once is a characteristic that would be interesting to study further. Does this characteristic exhibit itself solely with technology, or does this ability transfer to other aspects within schooling and life? Is this tendency of functional multitasking student specific or is it characteristic of all students at some

level? What could this tendency imply and create regarding pedagogical practices in general? Further investigation regarding this phenomenon of multitasking could lead to further insights and implications regarding integrating technology within instruction as well as general instructional practices.

### ***Cyberbullying within technology-rich schools***

Within this study's interviews and discussions with faculty, the issue of cyberbullying was presented as a problem that had arisen since the adoption of the one-to-one laptop initiative. There was one specific incident prior to the start of the study in which students created a FaceBook page that said something to the effect of, "If you hate (teacher's name) join as a friend." When discovered, this resulted in a banning of iBook computers for a month for those students involved. Another situation shared, occurring prior to the study, focused on the perceived hurtful emails that were sent and received between a girl and boy regarding how the girl was supposedly treating her boyfriend.

With the influx of technology available within schools and the increasing access students have to technology; this issue of cyberbullying is becoming more prevalent. Therefore, within schools anti-bullying measures are going to need to be expanded to consider ways to educate and prevent cyberbullying. This is particularly necessary to consider within schools that have a one-to-one laptop initiative since the technology is accessible to students on an hourly basis. Therefore, it would be a prudent line of research, to investigate further the issue of cyberbullying. How are technology-rich schools addressing this issue? What incidents or situations are occurring? How are students choosing to bully via technology? What are the perceived impacts it is having? All of these are questions that could benefit from further research.



## ***Professional Development***

When considering implementing a one-to-one laptop program within schools, there are two major considerations that should be kept in mind to facilitate technology implementation and ease in the transition: (a) professional development that is either requisite or elective regarding technology integration tasks, and (b) professional development that supports the integration of technology within pedagogical practices. Administrators and those responsible for organizing and facilitating professional development should attend to these recommendations in order to support ongoing growth, implementation, and integration of the technology within instructional practices.

### ***Requisite versus elective technology integration tasks***

Within the current study, teacher and administrator participants referenced past professional development with differing sentiments. Most of the professional development previously shared was considered optional because it occurred after contract hours. Many of the teacher participants within this study took advantage of these opportunities, but some did not for various reasons including after school coaching, attending continuing education courses, or other personal reasons. Therefore, most of the topics, strategies, and tools were presented as possible options for teachers to use within their classrooms and/or instruction. Hence, most of these suggestions remained unimplemented. One participant stated, “There’s so much out there, we jump from one thing to another and unless you use it, it falls by the wayside.”

There were, however, some late start dates in which time designated normally for faculty meetings was utilized to demonstrate how to use specific technology tools that were then required by the teachers to implement to some extent. Many of these tools centered on PowerSchool, the district’s web-based management database that organized and maintained

records for grades, lunches, and attendance. During the semester of this study, the required activity for teachers was to post at least one lesson plan and accompanying materials onto PowerSchool. Required by the administration, these activities and tools were the activities and tools utilized most by teachers.

Therefore, when planning for professional development to continue growth and advancement of technology utilization and implementation, it would be necessary to determine what technological skills, tools, and integrations are most important. It is focusing on these specific tools, tasks, and/or activities, that most time and effort should be spent. Specific tools and tasks should be identified as a requirement for teachers to demonstrate their utilization or attempt at utilization. Focused attention on technology goals for more than just one session or workshop should be mandatory. Providing time for teachers to familiarize themselves with the technology and allowing them time to ask their questions and obtain the answers they need to successfully utilize the technology when on their own are necessary. Any ancillary tools, skills, tasks, and/or activities should be introduced and given as models. Those teachers who are ready for a new challenge or see applicability in how they might be utilized will follow through with the utilization of the specific technology.

### ***Professional support integrating technology within pedagogical practices***

Prior to implementation of a one-to-one laptop initiative or any significant technology initiative, it is vital to provide teachers with professional support regarding how to integrate the technology within pedagogical practices. Within this study, teachers received their iBook laptops *after* students had received theirs. This made many teachers perceive that they were at a disadvantage from the start. One teacher stated, “This is dumb, you’re (the district) tying my hands behind my back and you’re (the district) letting them (the students) take off without me.”

Therefore, it is strongly recommended that teachers be provided with the pedagogical support necessary for them to learn how to integrate technology within instruction, and to discover how technology integration can be infused within their current pedagogical practices in order to smoothly make this transition. It would be ideal if the professional support could be customized to the individual content areas so that teachers can identify the direct applicability with the technology methods that may be utilized within their specific content area.

### ***Instruction***

Within this research study, there were reoccurring instructional areas and concepts that, if built upon, could extend the perceived impact that technology and content area literacy, the new literacies, and critical literacy has upon classroom teaching. Through consideration of these recommendations, teacher's instructional practices could be more effective regarding instruction that enhances student learning of content facilitated by technology.

### ***Expanding comfort zones***

Instructionally, content teachers must take risks and expand their comfort zones. Therefore, as a result of the findings from this research, it would be recommended that instructionally, teachers expand their comfort zones regarding:

- Content area literacy,
- Integration of technology and the new literacies, and
- Critical literacy.

An administrator stated, "I think they're (teachers) being forced to get out of their comfort zone a little bit and explore these opportunities."

*Content area literacy.* Teachers within this study attempted to include some content area literacy instruction within their classrooms. However, there was a real sense of uncertainty by the teachers regarding their *knowledge of* content area literacy instruction and their *comfort teaching* content area literacy. As one teacher mentioned, “I really think that the district needs a reading specialist because high school teachers are not trained to teach reading, and there are a lot of our students that are really low.” However, as Fordham (2006) touts, content area teachers are experts within their fields. “They are the best equipped to show students how to read the texts unique to their subject” (p. 390). Hence, it becomes necessary for content area teachers to expand their comfort zone instructionally, fostering the content area literacy skills of their course content in order to support their students’ learning and understanding of content area literacy.

*Integration of technology and the new literacies.* As a result of the one-to-one laptop initiative, teachers within this study were confronted with a new element within the classroom and during instruction. This element brought with it instructional challenges, management challenges, and challenges of overall perceptions. Instructionally, when integrating technology within lessons and teaching, teachers need to step outside of their comfort zones, moving past the utilization of software and technology that is familiar and contented. Rather, teachers need to take risks, explore different ideas, and expand upon current practices in order to keep abreast with technological trends. Teachers will also need to rethink their role in order to allow for expertise to originate from all present within the classroom, thus allowing for others to support and guide instructional activities or applications when appropriate.

*Critical literacy.* Within this research, teachers were documented as presenting viewpoints and positions toward students more frequently than offering discussions or debates about views and stances that could foster and lead to critical conversations. In order to support

critical literacy, teachers must again expand their comfort zones in order to take risks associated with choosing texts to read, encouraging students' sense of agency to discuss critical topics and issues, and allowing for flexibility in the classroom regarding the dynamic of power.

This sense of expanding beyond one's current comfort zone instructionally requires time, guidance, and support in order to realize the benefits and recognize how to move beyond the present delivery of lessons, facilitation of instruction, and enhancement of student learning.

### ***Teach with what students use***

This study highlighted that there are technologies, and literacies that are utilized by students for recreational purposes and performing tasks that are of interest to them. Therefore, it would be recommended that instructionally, teachers teach with the technologies and literacies that students are currently utilizing as they relate to:

- Content area literacy, and
- Integration of technology and the new literacies.

During a conversation with Cardinal Creek's District Technology Consultant, he talked about "teaching with the tools the kids use; instead of banning them, demystify them, and use them for educational purposes."

*Content area literacy.* During observations and interviews, students were documented as choosing to read texts like trade magazines, zines (electronic magazines), news articles, blogs, and social networking sites. The reading and literacy practices employed by students for recreational purposes were frequently, not only characteristic of high student interest, but typified as being electronic sources, shorter in length, and supported by visual stimuli.

Therefore, when choosing texts for students to read in order to foster content area knowledge, it

is recommended that a variety of genres and textual formats that align to the types of texts students are already reading, should be integrated within instructional practices.

*Integration of technology and the new literacies.* Many students reported listening to music through iTunes; sorting, editing, and downloading pictures through iPhoto; and visiting various social networking sites like FaceBook and MySpace. Students are utilizing these programs and sites, and some teachers perceived how some students interact within them as reckless and inappropriate. This point is exemplified during one conversation with a teacher:

*It seems like they're (the students) going in the wrong direction . . . There was a student who made a FaceBook page that said, if you hate (insert teacher's name) sign-up . . . We had the one girl who is taking very seductive pictures and seductive poses.*

Therefore, it would be prudent to support and foster appropriate interaction and utilization of technological software programs and Internet websites.

One of the easiest methods to accomplish this would be through integrating these technologies that students are currently utilizing into classroom instructional practices. For example, a teacher might support utilizing iPhoto to support learning, perhaps through vocabulary development; or utilizing GarageBand to create a musical score that demonstrates understanding of a content area concept; or connecting with others studying the same subjects and concepts through the creation of a blog, Wiki, or social networking site.

These suggestions take into consideration the technology and literacies students are currently utilizing, and interested. Through this implementation of what students are already employing within instructional purposes, the potential is enhanced of student learning increases.

## Summary

As a result of this research, more has been learned and discovered regarding how a one-to-one laptop initiative is perceived to impact teacher's instruction to enhance student learning in regard to content area literacy, the new literacies, and critical literacy. The research from this study supports that attempts are being made to address these components within individual classrooms, yet more should be and could be implemented within instruction to increase and enhance student learning and literacy skills.

It is the 21<sup>st</sup> century technology surrounds us and is continuously increasing in function, form, and frequency of use. One-to-one laptop initiatives are becoming a trend sweeping through schools. But just because access to technology is available, it does not mean that students are being more adequately prepared and educated. My expectations toward this research study were uncertain. What would I discover? How would the technology be utilized? Would I be inspired or discouraged? While I was inspired by the nuances and the fleeting moments that were unexpected yet monumental, I was also discouraged when confronted with the potential and possibilities that were not yet realized.

Literacy within content areas is specific and unique within courses and curriculum. It is the responsibility and necessity of content area teachers to facilitate the reading skills of students so that they can better read, understand, comprehend, and interpret the content within the course. Incorporating study guides and assessments that verify the comprehension of content is important. Yet more so, the need exists to facilitate and foster reading strategies to more completely understand how to read content specific texts and comprehend what is being read. Here too, assumptions should not be made regarding the knowledge base teachers have regarding content area literacy practices and/or pedagogical practices associated with content area literacy.

It is necessary for teachers to be given strategies and resources necessary to effectually impact and influence teacher's instruction to enhance student learning.

Students revel in technology. Digital natives have grown up within the age of technology and even if not accessed at home, they have had experience with it. However, that does not necessarily mean that all students know the intricacies and potentials of programs, how to utilize the technology responsibly, or how the technology can be used to support their academic achievement and professional goals. Teachers become a vital piece of the technological equation. Assumptions should not be made and knowledge should not be taken for granted. It is the responsibility of administrators to equip teachers with time, resources, and training necessary to confidently and courageously integrate technology within instruction. It is the responsibility of teachers to model, support, and facilitate responsible usage of technology within content area instruction.

Critical literacy requires risk taking. It is risky for teachers to open up discussions within the classroom about topics that could be controversial or sensitive, and it is risky for students to offer their thoughts, opinions, and perceptions about issues that might not be popularly aligned with viewpoints of the majority. Instruction that fosters and promotes critical literacy requires a shift in thinking and possibly a shift within pedagogical philosophy. Instructional practices and pedagogy within a classroom that encourage critical literacy require student-centric techniques, allowing for an agentive self-image, a balance of power within the classroom, and the sense that their perceptions, discussion, and actions can be transformative.

Potential is limitless regarding the possibilities that technology integration can offer in relation to content area literacy, the new literacies, and critical literacy regarding teachers' instructional enhancement of student learning. For this to happen, teachers, students and



administrators must take risks; the fear of failure must not inhibit action. In order for growth, development, and advancement, individuals need to move beyond the fulcrum of what is comfortable, to what is new and challenging. Implementation of technologies such as PowerPoints, email, and word processing are not sufficient anymore. Education can no longer teach students only the tools of today, but must embolden students with the knowledge of the processes and the conceptual frameworks that will prepare them to keep stride with the rapidly evolving world. The intersection of technology and content area literacy, new literacies, and critical literacy is not static, but rather constantly dynamic. Instruction that enhances student learning will be that which prepares students with the skills, strategies, and supports necessary to realize their capacity to keep pace with this ever-changing world. Students of the 21<sup>st</sup> century do not have the luxury of solely linear, traditional literacy competencies; they must assimilate new, multi-dimensional literacies, and the associated skills necessary to evolve and excel with the emerging literacies they will encounter throughout their lifetimes.

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## **Appendix A - Glossary of Terms**

The following terms are defined for the purpose of perspective and clarity within this study.

**Agency** – The sense one has that they have the capacity to successfully accomplish a task (Johnston, 2004).

**Content area literacy** – “The ability to use reading and writing to learn subject matter in a given discipline” (Vacca & Vacca, 2002, p. 15).

**Critical literacy** – “Understanding the ways in which language and literacy are used to accomplish social ends. . . . developing a sense that literacy is for taking social action, an awareness for how people use literacy for their own ends, and a sense of agency with respect to one’s own literacy” (Dozier, Johnston, & Rogers, 2006, p. 18).

**Critical reading** – Reading for meaning, recognizing and attending to what is said within a text in addition to how it is stated. Recognizing the validity of texts and maintaining an awareness that the authors purpose when writing the text.

**Deictic** – “A word used by linguists and others (Fillmore, 1972; Murphy, 1986) for words such as now, today, here, there, go, and come. These are words whose meanings change quickly depending on the time and space in which they are uttered” (Leu, Kinzer, Coiro, & Cammack, 2000, p. 118). Because technology is so rapidly changing and influencing how one reads and writes, literacy is rapidly changing, thus creating *deictic* new literacies.

**Digital divide** – The access to and quality of technology. This term describes the dichotomy between the “haves”, those who do have access and quality of use with technology, and the “have nots”, those without or with drastically less accessibility (Monroe, 2004).

**Enacted curriculum** – The curriculum that is played out within classroom instruction, the curriculum that is observable (Marsh & Willis, 2003).

**Experienced curriculum** – The curriculum that each student recognizes and is impacted by as a result of experiencing his/her own unique interpretation of the enacted curriculum (Marsh & Willis, 2003).

**Foundational literacies** – The more traditional forms of literacy that are characteristic and value print-based texts (Leu, Kinzer, Coiro, & Cammack, 2000).

**Hidden curriculum** – The curriculum that is covert, unplanned, and often reveals itself through the culture of the school and classroom (Marsh & Willis, 2003).

**Information and communication technologies (ICTs)** – Technologies that provide access to information and communication. Some examples include the World Wide Web, e-mail, blogs, instant messaging, listservs, word processors, and spreadsheets (Leu, Kinzer, Coiro, & Cammack, 2000).

**Instructional Enhancement of Student Learning** – Used within this study to include *all* instructional techniques, methods, and activities that facilitate learning taking place within the student, such as, technology learning, literacy learning, and content area learning.

**Multiliteracies** – An open-ended set of multiple, flexible literacies that are necessary in order to function within diverse contexts and communities (New London Group, 1996).

**New literacies** – The literacies that are needed to utilize the Internet and other ICTs. Within this new realm of literacies there are skills, strategies, and dispositions that are necessary to optimally use and adapt to their deictic nature and ultimately function successfully within this emerging world (Leu, Kinzer, Coiro, & Cammack, 2000).

**Planned Curriculum** – The curriculum that is created often in collaboration with others who have a vested interest in what students should know and learn. This is usually the official curriculum that guides teacher’s instruction (Marsh & Willis, 2003).

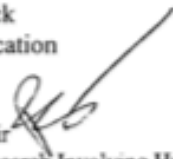
**Tandem focus group interview** – This data source is derived from the foundations and guidelines of more traditional notions of focus group interviews (Morgan, 1988). Data is collected, via this source, through conducting multiple, simultaneous focus group interviews. Participates are provided with a discussion guide to assist in maintaining a focus to the interview. The researcher is not necessarily the facilitator of any one focus group, but rather an observer, seeking clarification when necessary.

## **Appendix B - IRB Acceptance Letter**



University Research  
Compliance Office  
203 Fairchild Hall  
Lower Mezzanine  
Manhattan, KS 66506-1103  
785-532-3224  
Fax: 785-532-3278  
<http://www.ksu.edu/research/comply>

TO: Marjorie Hancock  
Elementary Education  
246 Bluemont

FROM: Rick Scheidt, Chair   
Committee on Research Involving Human Subjects

DATE: February 6, 2008

RE: Approval of Proposal Entitled, "Content area literacy instruction and student learning within a one-to-one laptop initiative rural high school."

Proposal Number: 4537

The Committee on Research Involving Human Subjects has reviewed your proposal and has granted full approval. This proposal is **approved for one year from the date of this correspondence, pending "continuing review."**

APPROVAL DATE: February 6, 2008

EXPIRATION DATE: February 6, 2009

Several months prior to the expiration date listed, the IRB will solicit information from you for federally mandated "continuing review" of the research. Based on the review, the IRB may approve the activity for another year. **If continuing IRB approval is not granted, or the IRB fails to perform the continuing review before the expiration date noted above, the project will expire and the activity involving human subjects must be terminated on that date. Consequently, it is critical that you are responsive to the IRB request for information for continuing review if you want your project to continue.**

In giving its approval, the Committee has determined that:

- There is no more than minimal risk to the subjects.  
 There is greater than minimal risk to the subjects.

This approval applies only to the proposal currently on file as written. Any change or modification affecting human subjects must be approved by the IRB prior to implementation. All approved proposals are subject to continuing review at least annually, which may include the examination of records connected with the project. Announced post-approval monitoring may be performed during the course of this approval period by URCO staff. Injuries, unanticipated problems or adverse events involving risk to subjects or to others must be reported immediately to the Chair of the IRB and / or the URCO.



## **Appendix C - Acceptance Email from Research Site**

The following email was written by the researcher on January 9, 2008, and received a return response on January 10, 2008.

Leah,

Just let me know what we can do to facilitate your needs. I am glad we can help out.

(*name*)  
Principal

“There is no experience better for the heart than reaching down and lifting people up.”

-John Andrew  
Holmer

On Jan 9, 2008, at 11:14 AM, leahmac@ksu.edu wrote:

> Good morning!  
>  
> I want to thank you for taking the time to meet with me last week to  
> discuss my proposed research agenda. I appreciate your willingness in  
> allowing me to come visit and observe your school.  
>  
> During our meeting, I mentioned that after I met with my doctoral  
> committee I would contact you with a more final idea for when I would  
> be at the school, and what specific types of data I would be  
> collecting. This committee meeting will likely take place toward the  
> end of January. As soon as my committee meets, I will email or call  
> you so that we can finalize plans.  
>  
> Again, thank you for your hospitality.  
>  
> Take care and have a great day.  
>  
> Leah McKeeman  
>

## **Appendix D - Informed Consent Documentation**

**KANSAS STATE UNIVERSITY - INFORMED CONSENT FORM**

**PROJECT TITLE:**

CONTENT AREA LITERACY INSTRUCTION AND STUDENT LEARNING WITHIN A ONE-TO-ONE LAPTOP INITIATIVE RURAL HIGH SCHOOL

**APPROVAL DATE OF PROJECT:** Feb. 2008

**EXPIRATION DATE OF PROJECT:** Feb. 2009

**PRINCIPAL INVESTIGATOR/ CONTACT INFORMATION:** Dr. Marjorie Hancock, Professor and Coordinator of Graduate Programs in Curriculum and Instruction, 785-532-5917 (office), mrhanc@ksu.edu

**CO-INVESTIGATOR/ CONTACT INFORMATION:**

Leah McKeeman, Doctoral Candidate, 785-539-4017 (home), 913-484-7087 (mobile), leahmac@ksu.edu

**QUESTIONS/CONCERNS/PROBLEMS PLEASE CONTACT:**

Dr. Marjorie Hancock, 785-532-5917 **OR** Leah McKeeman, 785-539-4017 or 913-484-7087

**IRB CHAIR CONTACT/PHONE INFORMATION:**

- Rick Scheidt, Chair, Committee on Research Involving Human Subjects, (785) 532-3224.
- Jerry Jaax, Associate Vice Provost for Research Compliance (785) 532-3224.

**PURPOSE OF THE RESEARCH:**

The purpose of this case study is to explore and describe participant’s (teachers, students, administrators, parents) experiences and perspectives regarding the culture and environment of teaching and learning within a one-to-one laptop initiative rural high school.

**PROCEDURES OR METHODS TO BE USED:**

- The co-investigator, Leah McKeeman (see contact information above), will observe and take notes within content area classrooms on a semi-regular basis throughout the duration of the study.
- The co-investigator will conduct focus group interviews in which attendance is voluntary.
- The co-investigator will collect data through in-depth interviews with individual participants in addition to more informal/conversational interviews.
- The co-investigator will collect data through documents and artifacts.

**LENGTH OF STUDY:** February – May, 2008

**RISKS OR DISCOMFORTS ANTICIPATED:** None

**BENEFITS ANTICIPATED:**

**Teachers:** During individual interviews, participants will be reflecting thus fostering growth within their profession. During focus group interviews, participants will have a platform to collaborate and brainstorm together as a community of professionals.  
**Students:** Participants will be given a platform to express their perspectives regarding the school’s laptop initiative. Participants will also be encouraged to critically reflect upon their learning and the learning process.

**EXTENT OF CONFIDENTIALITY:** *ALL* names and identifiable locations will be changed or omitted in the final report and in all documents or publications related to this study.

**TERMS OF PARTICIPATION:** I understand this project is research, and that my participation is completely voluntary. I also understand that if I decide to participate in this study, I may withdraw my consent at any time, and stop participating at any time without explanation, penalty, or loss of benefits, or academic standing to which I may otherwise be entitled. I (We) verify that my (our) signature(s) below indicates that I (we) have read and understand this consent form, and willingly agree to participate in this study under the terms described, and that my (our) signature(s) acknowledges that I(we) have received a signed and dated copy of this consent form.

**Participant’s Name:** \_\_\_\_\_

**Participant Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Parent/Guardian Signature:** \_\_\_\_\_  
**(if participant is under 18 years of age)**

**Date:** \_\_\_\_\_

**Witness to Signature: (project staff)** \_\_\_\_\_

**Date:** \_\_\_\_\_



Department of Secondary  
Education  
College of Education  
364 Blumant Hall  
1100 Mid-Campus Drive  
Manhattan, KS 66506-5333  
785-532-5904  
Fax: 785-532-7304

Dear Students and Parents:

My name is Leah McKeeman. I am currently working on my doctoral degree in Curriculum and Instruction at Kansas State University. In addition to working on a Ph.D., I teach the K-12 Foreign Language Methods courses at K-State and supervise foreign language student teachers.

I am writing to seek your consent in a research study that will investigate the impact your school's innovative laptop initiative has had on teaching and learning. It is my intent to observe content area classrooms where the actual instruction is taking place, getting a first hand look at how this technology has impacted teacher's instruction and student's learning. I also will be asking for participation within both individual interviews and focus group interviews. Through these interviews, I would like to hear the perspectives of students to get a more complete picture of how this technology has made an impact.

I will begin conducting research in February 2008 and will continue through the end of school in May 2008. During this time, I am asking for informed consent to observe and conduct interviews. Interviews will be audio recorded to ensure accuracy. However, all responses will remain confidential, and all names will be either changed or omitted to ensure privacy when writing up the final report or within any subsequent publications.

Participation is voluntary and can be withdrawn at any time. Participation or nonparticipation will have no effect on grades earned.

If you have any questions or concerns, please don't hesitate to contact me at home 785-539-4017, on my mobile phone 913-484-7087, or via e-mail at [leahmac@ksu.edu](mailto:leahmac@ksu.edu). You also may contact my major advisor, Dr. Marjorie Hancock at 785-532-5917 (office) or [mrhanc@ksu.edu](mailto:mrhanc@ksu.edu). I appreciate your consideration in consenting to assist me within this research endeavor.

Attached to this letter is the consent form for this study. After carefully reading it, please sign and return one copy of the consent form to the envelope in the office on Mrs. Brenner's desk as soon as possible. I am looking forward to this opportunity. Thank you in advance for your participation.

Sincerely,

Leah McKeeman  
Doctoral Candidate  
785-539-4017 (home)  
913-484-7087 (mobile)



Department of Secondary  
Education  
College of Education  
364 Bluemont Hall  
1100 Mid-Campus Drive  
Manhattan, KS 66506-5333  
785-532-5904  
Fax: 785-532-7304

Dear Teachers:

My name is Leah McKeeman. I am currently working on my doctoral degree in Curriculum and Instruction at Kansas State University. In addition to working on a Ph.D., I teach the K-12 Foreign Language Methods courses at K-State, and supervise foreign language student teachers.

I am writing to seek your consent in a research study that will investigate the impact your school's innovative laptop initiative has had on teaching and learning. It is my intent to observe your content area classroom where the actual instruction is taking place, getting a first hand look at how this technology is impacting instruction and your student's learning. I also will be asking for participation within both individual interviews and focus group interviews. Through these interviews, I would like to hear your thoughts and opinions in order to get a more complete picture of how this technology has made an impact.

I will begin conducting research in February 2008 and will continue through the end of school in May 2008. During this time, I am asking for informed consent to observe within your classroom and to arrange for convenient times in which to conduct interviews. Interviews will be audio recorded to ensure accuracy. However, all responses will remain confidential, and all names will be either changed or omitted to ensure privacy when writing up the final report or within any subsequent publications.

Participation is voluntary and can be withdrawn at any time.

If you have any questions or concerns, please don't hesitate to contact me at home 785-539-4017, on my mobile phone 913-484-7087, or via e-mail at [leahmac@ksu.edu](mailto:leahmac@ksu.edu). You also may contact my major advisor, Dr. Marjorie Hancock at 785-532-5917 (office) or [mrhanc@ksu.edu](mailto:mrhanc@ksu.edu). I appreciate your consideration in consenting to assist me within this endeavor.

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Sincerely,

Leah McKeeman  
Doctoral Candidate  
785-539-4017 (home)  
913-484-7087 (mobile)

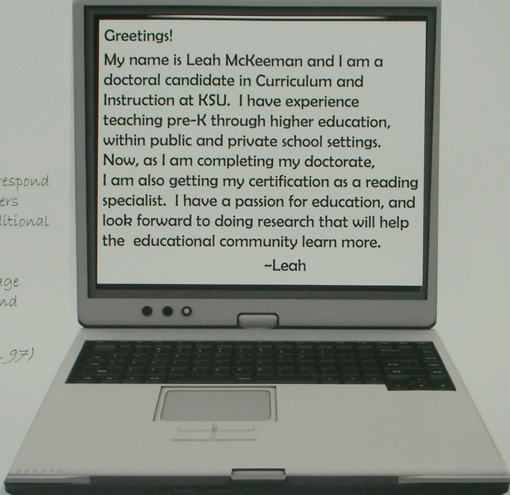
## **Appendix E - Research Poster Picture**

This poster was displayed during parent teacher conferences in which as the researcher, I was present to answer questions and concerns of all present. This poster was designed to provide a brief overview of my research study, and to elicit feedback from individuals regarding their thoughts and viewpoints.

## WHAT IS THE JUNCTURE BETWEEN THE LAPTOP INITIATIVE AND LITERACY TEACHING AND LEARNING?

“ Adolescent learners ... will continue to respond to emerging technologies, challenging teachers across all content areas to push against traditional ideas of reading/writing/communicating meaning while also providing students with authentic, meaningful opportunities to engage actively in meaningful work that extends and elaborates on academic literacy. ”

*(Kajder, 2007, p. 97)*



Greetings!  
My name is Leah McKeeman and I am a doctoral candidate in Curriculum and Instruction at KSU. I have experience teaching pre-K through higher education, within public and private school settings. Now, as I am completing my doctorate, I am also getting my certification as a reading specialist. I have a passion for education, and look forward to doing research that will help the educational community learn more.  
-Leah

### WHAT DO YOU THINK?

How has the school's laptop initiative influenced teacher instruction and student learning regarding:

- ❖ content area literacy,
- ❖ new literacies, and
- ❖ critical literacy?

### C

Content Area Literacy:

- ◆ “The ability to use reading and writing to learn subject matter in a given discipline” (Vacca & Vacca, 2002, p. 15).
- ◆ Content area teachers are experts within their fields “they are the best equipped to show students how to read the texts unique to their subject” (Fordham, 2006, p. 390).

### N

New Literacies:

- ◆ Includes literacies used within the Internet and ICTs (Information Communication Technologies)
- ◆ New literacies can elicit multiple modes of texts within the content area, motivating students, and providing them with choice.
- ◆ Through the use of the new literacies, the connection can be made between reading and content area instruction (Sweeny, 2007).

### C

Critical Literacy:

- ◆ The ability for students to critically think about and analyze all the information they encounter (Dozier, Johnston, & Rogers, 2006).
- ◆ Critical literacy empowers students to realize the legitimacy of their own knowledge and recognize how they can use their literacy skills to critically impact and influence their social environment.



## **Appendix F - Sample Surveys from all Participant Groups**

## Administrator Survey Questions

1. What is your overall perception of the technology initiative at this time? Please explain.

The laptop initiative is perhaps taken too much for granted. We wanted the students to feel ownership for the laptop, which they do, but they sometimes fail to remember that the laptops are a privilege, not a right.

The educational value of the technology has not been capitalized on but it is pervading all areas of ██████████ High School. Much good and some not so good has come from the program.

2. How has the technology initiative impacted teaching and learning within the school?

Every teacher and every student has access to technology resources 24/7 making it possible to access current information at the moment the need or desire to know arises.

Teachers have had to learn new classroom management techniques. They have the option to use the technology or not, it is not dictated by the availability of the lab or someone else's schedule giving them greater flexibility. Students have anytime access to work in progress. They have 21<sup>st</sup> century tools to help them learn 21<sup>st</sup> century skills.

3. How has this technology initiative grown/changed over the 3 year period since it was originally implemented?

When students first got laptops they were very much in the forefront. There was a measure of fear on the part of the teachers in the beginning. Often the question was "what do we do with them?" (the laptops)

After 3 years the technology has become nearly invisible. Teachers expect the technology to be available at all times and use it on a regular basis in nearly every class. Resistance has turned to resignation.

At no time did the administration push teachers to use technology just for the sake of using it. Learning has become more personal and student centered.

4. Please describe successes/challenges resulting from this technology initiative.

Challenges – teacher buy-in, student off-task or inappropriate use, the need for a change in pedagogy

Successes – teachers who still express reservations with the laptop initiative but still use it, the math teacher who embraces the technology and tries to use it in ways that stimulate and enhance learning, students who use it for productivity and learning as well as recreation.

5. In your opinion, what factors contribute to the successful or unsuccessful implementation/integration of laptops? Please explain.

Factors that contribute to success –

- Administrator support
- Appropriate staff development

- Adequate and stable infrastructure (things work)
- Instruction and support as needed
- Willingness to try a new approach

Factors that inhibit success:

- Lack of direction
- Lack of training or appropriate staff development
- Allowing off-task behavior
- Lack of vision, buy-in, commitment to the program

6. What are your expectations from the technology initiative?

- The technology is ubiquitous and invisible
- Every student has an equal opportunity and equal resources to be successful
- Teachers understand that the technology is not the key but rather how the technology can enhance learning by engaging students, promoting higher order thinking, and developing 21<sup>st</sup> century skills
- Test scores may not rise but students will learn and retain more things that have lifelong value

7. Please share any additional comments you may have.

As Instructional Technology Coordinator I can see and relate to the challenges of both teachers and administrators without the personal involvement.

I understand that teachers would like the administrators to have a firmer hand in controlling off-task behavior.

I understand that teachers still have to get students ready for the test and that it does require a large investment of time to effectively implement technology integration.

I understand that the administrators do not want to place undue pressure on the teachers.

I do not understand teachers who are unwilling to invest at least a little time or show some interest in using the technology to improve teaching and learning.

I do not understand administrators who do not provide adequate staff development in the areas of technology integration that could make a difference.

I do not understand administrators who do not stand behind the rules.

I do not understand students who have so much freedom with the technology and choose not to follow the rules.

██████████ is fortunate to have the laptop initiative and it has great possibilities that we are still growing in to. There have been a few “issues” but not many. I would do it again. If there was one thing I could change about the way we did it, it would be to provide more guidance and staff development for the teachers.

## Teacher Survey Questions

Please return to Leah McKeeman, to the box in [REDACTED] office, or via email to leahmac@ksu.edu.

Thank you!

---

1. What subject do you teach? English/Spanish
2. How long have you been teaching? 32 public school, 5 yrs (Adult basic: GED, ESL)
3. How would you rate your overall proficiency using technology in instruction? Please explain.

I am working to incorporate it into instruction, student research and projects, and supplemental or remedial practice when possible. As for ranking my proficiency, without having a model with which to compare, I feel hesitant to judge. I know I need to learn a great deal more. Time to do so is limited.

4. How is literacy and reading a part of your classroom? Please explain.

We do a great deal of reading and work with literacy skills in all English classes.

5. How has the technology initiative impacted content area literacy/reading? Please explain.

We've had little guidance or instruction in utilizing the computer for this other than having some websites pointed out or those we've discovered for ourselves. We need help!

I was closely involved with implementing the AR/ Reading Renaissance program for several years. The data from that indicated that reading comp improved. I'm not sure of the impact changing to Reading Counts will have.

6. How has the school's technology initiative impacted your teaching, planning, and/or instruction?

It has opened up another avenue for students to use as a source of info, things like streaming video enhance learning and understanding. I try to tie technology in whenever possible; we use it in Spanish and world lit (taught until this year) for enrichment projects.

Having a projector in each classroom would help greatly, especially in the revision and editing. One definite negative impact I've encountered is the educational suppliers do not keep pace with the technology updates. For example, one of the rare, exceptional supplemental practice programs for Spanish will not run on our OS X computers and the company does not plan to update the program for macs.

7. In your opinion, how has the technology impacted students?

They enjoy it. Too many regard it as their personal toy rather than an educational tool. It does open up a whole world of presentation and sharing opportunities that they never had before. It's been my observation that students are wordier when they compose on the computer and have more trouble editing.

8. Please describe successes/challenges you have experienced as a result of the technology initiative?

I have used projects as an important part of Eng IV and World Lit, starting clear back when HyperCard and HyperStudio were the precursors to Powerpoint. Students enjoy the multimedia experience.

I think the greatest drawback is TIME. Teachers were not introduced to this "technology initiative" and adequately trained in its effective use before the students received their laptops. Therefore, we're playing catch-up most of the time. Coupled with multiple-preparations and the heavy paper load that goes along with both Spanish and English, being told to investigate, self-instruct, and develop technology-based curricula on our own time is unrealistic.

9. What professional development have you received up until now regarding laptop use, implementation, and integration within the classes you teach?

Only basic, generic use applicable to the whole faculty. We need curriculum-specific training by someone who is experienced not only with different programs but also with their actual application and success in the classroom.

10. Please describe types of professional development you would like to receive as you continue to use laptops in your classroom.

One shortcoming we have encountered as high school English teachers is that we are not trained to teach students how to read, those basic skills taught at the elementary level, including word attack, basic comprehension, fluency, etc. Secondary teachers are not trained in interpretation, to deal with those lower-level instructional skills. (This is the 1<sup>st</sup> year we have had only one lang. arts teacher at the high school. When we had 2 teachers we all shared this same concern.) I think this is where your area of expertise comes in. Your help is needed.

11. Please share any additional comments you may have.

## Parent Survey Questions

Please return along with a completed informed consent form to Leah McKeeman, to the box in [REDACTED] office, or via email to leahmac@ksu.edu.

Thank you!

---

1. I am a parent of a \_\_\_\_\_ student. (please circle/highlight one)

**Freshman**

Sophomore

Junior

Senior

2. What is your overall perception of the one-to-one technology initiative at this time? Please explain.

I think the one-to-one technology initiative at this time if an excellent one. It's a great learning tool as well as research tool that is available 24 hours a day for the student to access.

3. What are your expectations for the technology initiative?

My expectations as a parent are that it will be increasingly updated as technology is and it will make the student aware of those updates in the world out there. I would hope that some day all classes would be available via laptop.

4. How has the technology initiative impacted teacher's instruction within the school?

I don't feel that this is a question that I can answer due to I don't have one-on-one with the teacher during classroom time.

5. How has the technology initiative impacted your student's learning within the school?

The technology has impacted our student within the school by having it right at her fingertips, able to do research at the same time as book work. It's a tool that has many functions that can be utilized within the time at school.

6. Please describe successes/challenges resulting from this technology initiative.

In describing the successes, I can only advise you of what I have seen accomplished by our student, and that is the super powerpoint presentation she's done and also the computer apps book cover that she has created via the laptop. As far as challenges, our student has not expressed any to us and that may be something to ask her. We personally have experiences (husband and wife) the challenge of the layout of some of the textbooks and how difficult it is to go from one page to the next without going back through multiple pages. The access to info one right beside the other needs improvement.

7. Please share any additional comments you may have.

I don't have any additional comments to make. I know our student is looking forward to speaking with you regarding this.

## Student Survey Questions

Please return along with a completed informed consent form to Leah McKeeman, to the box in [REDACTED] office, or via email to leahmac@ksu.edu.

Thank you!

---

1. What grade are you in school? (Circle/highlight one)

Freshman

Sophomore

Junior

Senior

2. List all the ways in which you use your laptop while in school.

I do use a program called Garage Band first hour.  
Second hour I take notes and look up news articles.  
Third hour I do my writing on it  
Seventh hour I take college algebra on my laptop  
Eighth hour my book is on my laptop

3. How have the laptops impacted the reading you do in classes?

They really impacted the reading if your talking about reading emails and regular online stuff.  
They haven't really impacted like actual reading for a class.

4. What is the most exciting class assignment you have been given using your laptop? Please explain.

Probably GarageBand. It is a program with thousands of different musical melodies and just regular musical instruments. We usually have to create music for a certain scenario. Like music that pumps you up or music with a movie scene.

5. What do you like/dislike about having laptops to use in school?

I like having them for the internet and they make coming to school less boring. I don't like how if you have a computer technology class you now can have homework. For some reason it makes our school not seem so small. Maybe the internet, I don't know.

6. Please share any additional comments you may have.

## **Appendix G - Sample of Field Notes**



**FIELD NOTES**

Date: 3.12.08

Setting/Context

Teacher: Ms. Apple

Subject: Geometry

Class Period/Duration: 11:30 – 12:30

**Descriptive Notes**

- Student presentation using PowerPoint
- T. sets up a video camera on a tripod - - says it's the first time she has used the video camera - - T. asks if it is recording - - multiple students help explain, 3 students stand around helping T. set it up - - the process to set up the camera takes 10 minutes
- Presentation PowerPoint titled Lesson 9.2 Pythagorean Theorem
- Presentation incorporates text, and clipart that is animated - - there is a balance between text, visual, and “white space” - - text is clearly able to be read
- S. is the teacher for the day, she has them do definitions and an example from their workbook
- $C^2=A^2+B^2$ ...is how it is written on the PowerPoint, says that it is supposed to be squared, but doesn't know how to make it small so that's how she wrote it
  
- The PowerPoint keeps flashing on and off...little loss of instructional time, T. and/or S. reinitializes it
- S. presenter keeps asking T. “is this is right?”
  
- The assignment of a worksheet is handed out and transparency is projected onto the screen, students go up to the whiteboard to write the equations

**Reflective Notes**

When there is unfamiliarity, there takes more preparation

This is where word processing and documentation would be important for T. to show students how to type in these equations accurately -  
- OK T. does

Checks for validation - - S. seems very unsure of herself

<ul style="list-style-type: none"> <li>▪ T. discusses O versus 0, there is a difficulty telling the difference when reading equations on the computer screen - - make sure to use the correct one</li> <li>▪ Students who are in the audience/the class whisper to each other and talk about things unrelated to what the S. presenter is doing</li> <li>▪ S. in class and S. presenter says they don't get the concept of a pathogen triple - - T. intervenes and gives an explanation</li> <li>▪ This project was supposed to be cooperative and students were to work in pairs - - S. presenter's partner for some reason has not been helping and doing anything (according to DA)</li> <li>▪ S. presenter gives an assignment to rest of class - - homework assignment</li> <li>▪ This assignment needs to be turned into S. presenter by Friday, and then S. is asked to grade the assignments by DA</li> </ul>	<p>A challenge of the technology</p> <p>Seems that students aren't showing respect for what S. presenter is doing</p> <p>Being an active support, resource, facilitator when needed</p> <p>Is this really cooperative learning or independent, is there accountability?</p>
---	---

**Lingering Thoughts, Comments, Questions:**

- S. presenter seems somewhat prepared (PowerPoint, outline of what class was to do)
- Presenter does not seem to be fully dedicated to the project - - doing it to fulfill a requirement, complete the assignment

## **Appendix H - Sample Tandem Focus Group Interview Protocol**

Bon appétit!

As you eat lunch I would like each of you to answer the adjacent questions. If as you are talking and/or actively listening to others, and you think of something related to the topic or near the vicinity of the topic, please share these thoughts as well. After you are done discussing please turn OFF the tape recorder. You are welcome to write any additional comments or questions you may have on the notecards at each table. These can be turned into the green sack on the way out.

Hello Seniors!!!

Thanks again for your help!

Leah

1. Tell me a story, a TRUE story about...
  - A time when you had to do research on the internet.  
What was the assignment?  
What specifically did you have to do?  
What were the expectations for the assignment?  
What did you learn from the experience/assignment?
  - A time when you read something that you enjoyed.  
Where were you?  
What were you reading?  
Tell me about it, why did you enjoy it?
  - A time when you worked with someone else to solve a problem or complete a project.  
Describe what you did.  
What did you like about the experience?  
What didn't you like about it?
2. Describe how you decide where to look for information when you are trying to find the answer to a question, be as specific as possible.
3. Describe how you learn best, or how you like to learn?

---

**21st century literacies include the ability to effectively access information, evaluate it, synthesize it, and contribute to the already existing information available.**

4. How do you demonstrate/use 21<sup>st</sup> century literacies? in school? outside of school?
5. Where and how have you learned these literacies/skills, please be as specific as possible?
6. What could teachers do to promote 21<sup>st</sup> century literacies?

The following is a sample of excerpts taken from a Tandem Focus Group interview.

There were five senior students during this interview.

---

Student: A time that we read something that we enjoyed?

Student: I like listening to the news things in Mr. Smith's class.

Student: Yeah, we try to find the weird news.

Student: Or yahoo on the news, and the website with the smoking gun . . . and it has the dumb criminals.

Student: Oh yeah those are really funny to read.

Student: Where were you?

Students in unison: Government.

. . . .

Student: And we enjoy it, because we like learning from that type of thing rather than books.

Student: I don't like books very much.

Student: I like reading books in general, but I don't like technical writing, like textbooks.

Student: I don't like reading the books on the computer.

Student: No, because you get distracted too easily.

Student: With the physics book, I have to like blow it up.

Student: Yeah, or I instantly go to the Internet.

Researcher: So, is there ever a time when you have to read technical writing, and you do like to read it, or not at all?

Student: I don't really like it no.

Student: Not at all.

Student: Well . . . except for like my instruction manual for the iPod, or cell phones, and cameras, and stuff you have to figure out in order to use it. And I don't even like to read it then, I just have to order to understand it.

. . . .

Student: One problem that I do have with computers is that teachers just assume that you're messing around, even when you are like actually working - and working really hard.

Student: Even when I have something on my computer, when I'm at home on like Face Book or something, and then I get to school, and I open up my laptop, and a teacher's standing right behind me, and they like jump down your throat, and I was like - it was already up?!

Student: I haven't got that happened to me. I guess I just Apple+Q everything.

Student: Yeah I do too.

Student: I use shortcuts like crazy.

Student: What we do?

Student: We do PowerPoint . . . a lot!

Student: PowerPoint . . . a lot.

Student: No more PowerPoint. I'm sick of PowerPoint.

Student: I have three PowerPoints right now - I hate it.

Student: Something besides PowerPoints would be nice.

Student: I like doing imovies . . . like doing (student's name) highlight film was pretty cool.

Student: I hate doing PowerPoints.

Student: I like PowerPoints, but that's all the teachers do.

. . . .

Student: Have we said what we liked or didn't like about the experience?

Student: Well we said we don't like PowerPoint.

Student: Well I don't think we hate PowerPoint. It's just that we are overloaded right now, and teachers are over using it. Since we have laptops, teachers are trying to make everything about computers, and not everything can be done on computers.

Student: It's fun to incorporate them sometimes, but I like to work with my hands.

....

Student: When they require us to do PowerPoint with a presentation, I focus more on making the PowerPoint, and not so much on the presentation, so my presentation is like really bad.

Student: And when we have like 50,000 guidelines to go by, you can't get creative with your PowerPoint, so it sucks all the fun out of the technology.

....

Student: I think the teacher needs to read with us.

Student: Yeah, like in government, when they put it up on the big screen, and then there's discussion - that's good. When we watched the Columbine video, that sparked a major discussion you know?!

Student: Well only parts of it, maybe in your class, but not mine as much.

Student: I listen, and I think things on my own. I just don't want to participate in a discussion.

Student: That's okay though.

....

Student: I think the computers have given the teachers a chance to have a babysitter for us without having to work.

Student: Yeah that is a very good point!

Student: Wow, that was good!

Student: Well like in physics, what has she done? She's given us chapters to create PowerPoints on.

Student: Yeah, what has she done?

Student: Well, I have her all by myself, and all I do, is do worksheets - all day, everyday.

Student: Teachers don't teach anymore, they just assign.

## **Appendix I - Sample of Data Analysis regarding the Utilization of Technology**



## Sample of a Student Survey

1. What grade are you in school? (Circle/highlight one)

Freshman

Sophomore

**Junior**

Senior

2. List all the ways in which you use your laptop while in school.

Type US History notes  
Study English terms  
Look up information  
Play Games  
Find different types of sports scores/articles

**Comment:** Ways in which students utilized technology. The first two in the list seem **academic** in nature, looking up information could be as well academic in nature for research. Playing games would be considered by teachers as non-academic or **recreational**. Finding sports scores or articles could be academic or recreational - Mr. Smith has students find current events, so if utilized in this way could be academic otherwise could be reading for recreational purposes.

Looking up information and finding different sports scores/articles on the laptop could also be categorized as using their **new literacy** skills

**Comment:** I wonder if the articles are located and chosen by the students, or if they are picked out ahead of time and students just must access them?

3. How have the laptops impacted the reading you do in classes?

I read online articles  
I don't read books much, but that's partly because I don't have a silent reading class.

4. What is the most exciting class assignment you have been given using your laptop?  
Please explain.

In Computer Applications we were given the box of a software program, came in, and using **Adobe Illustrator CS**, we had to re-create the cover of that box to scale. Most people didn't like it, but I enjoyed the challenge

**Comment:** Considered by the participant to be a way in which the laptops are utilized for a **creative project** that provided a welcomed challenge. Specific software was utilized to complete this assignment.

5. What do you like/dislike about having laptops to use in school?

I enjoy the different uses, but I do dislike how people "tune out" from the world when on their laptops sometimes

**Comment:** Overall positive view, but there is an **opie** issue with participant's **individual interactions and communication**

6. Please share any additional comments you may have.

I like the laptops for the most part.

## FIELD NOTES

Date: 3.3.08

Setting/Context

Teacher: Ms. Thompson

Subject: Advanced Biology

Class Period/Duration: 10:00 – 11:00

Descriptive Notes	Reflective Notes
<ul style="list-style-type: none"> <li>▪ 4 students in the class</li> <li>▪ Tells students that they need to be “working feverishly on their presentations”</li> <li>▪ One student begins working on hers by searching Google then looking through Wikipedia and finding information for her PowerPoint</li> <li>▪ Another boy plays a game on the internet, it is interactive like a story where there are popup blurbs that can be read</li> <li>▪ When T. gets up from desk he clicks over to a Google site with atoms - - when she sits down he returns to his game, resting his head in his hand to help shield his screen from her view... otherwise the chair and computer are angled and just enough of an angle that a good sight line is not visible</li> <li>▪ Another boy gets out a hard copy Physics text book and looks through it</li> <li>▪ The girl has her headphones in</li> <li>▪ This time after the teacher gets up and looks at each students computer screen they remain working for awhile (5ish minutes)</li> <li>▪ M. is the only one ready to do a presentation, other students will loose points for not being ready</li> <li>▪ 1 girls put information into her icalendar - - sections are in color coded boxes - - Air Anime character is on the computer screen desktop background</li> <li>▪ Students are asked to take out whatever they will need to take notes with - - one girl closes her applications gets to her desktop, takes out a blank unlined piece of paper and uses it to take notes on, another boy closes his laptop and gets out a pencil and 3x5 notecard, only to open up his computer and return to his game... it looks like a cartoon almost - - when asks individually to take notes he leaves the game off, but does not take notes, the other boy takes notes on his computer</li> </ul>	<p>Students do not find this to be important - - to loose points and/or to learn this material, little attention is paid/shown when M. is doing her presentation, questions are not asked, notes are not taken, gazing off into space is frequent</p>
	<p><b>Comment:</b> This student is utilizing the laptops for creating a student generated presentation - - utilize the <u>link libraries</u> to search for and locate information - - <u>critical thinking</u> are NOT being employed here - S. does not dig deeper to verify the validity or authenticity of the source of information</p> <p><b>Comment:</b> Teacher is attempting “<u>visibility</u>” but student is manipulating the system - - demonstrating off-task behaviors until T. is within close proximity and then toggles between screens projecting the illusion of working and being on-task - - S. demonstrates skill manipulating laptop and toggling between screens</p> <p><b>Comment:</b> The Physics text book is digital and downloaded onto all computers, yet he chooses to use the hard copy</p> <p><b>Comment:</b> Listening to music while working on presentation</p> <p><b>Comment:</b> This is not directly academic in nature or recreational - - it is supporting personal organization</p> <p><b>Comment:</b> S. has taken ownership in her laptop and has personalized the appearance and settings</p> <p><b>Comment:</b> Interesting that some utilize the laptops to support their note taking whereas other choose to use hard copy - - whereas one boy utilizes his laptop to facilitate his off-task behavior</p>

### Excerpt of Transcripts from Individual Interview with Ms. Hamilton

Researcher: What do you see the laptops being used for at the school both by yourself and by the students?

Hamilton: The word processing part is great as far as myself. I have kids keep class notes on them so they have study guides available. We do research, we use KanEd quite a bit, and we use Thomson Gale or that sort of thing, and we do author at literature searches quite a bit. I would like to use it more if I had a projector in here. I could see using it and putting worksheets on it and projecting it. I would love to have a projector that could hook up to the computer so we could project their themes, and talk about them, and for editing, and word study, and that type of stuff. So we just take documents that are on our computers, and not have so much hardcopy stuff. I also think the kids like to have some paper that they can refer to too. I am using Moodle a little bit. I think we could employ Moodle quite a little bit more.

**Comment:** All of this denotes hypothetical situation and ideas of how she MIGHT utilize the technology if particular tools and resources were in place - - but it is not what is taking place NOW - - therefore this is not necessarily relevant regarding how the technology is being utilized currently

Researcher: You say employ it (Moodle) more, what you mean by that?

Hamilton: I think it's a source for them to be able to have homework, and of course we are limited with installation, but all kids have Internet. I don't have Internet at home yet. It's good for reference. You know I think Ms. Thompson has worksheets and stuff that they can pull up to do. I have not gotten into that that much because I like to have guided study here in class, so I can vulture over their shoulders. But I see a real good use for that in Spanish. I mentioned that I had a wonderful program that was wonderful for reinforcing, and the kids enjoyed getting away from the books and onto the machine, and that's a nice type of variety. There are a lot of things that we do use the computers for. I use the PowerPoint for their projects. I have used the PowerPoints for my own instructional use. I did a two day work-study, but I was teaching world Lit, for Oriental literature and visited the Oriental Japanese and Chinese gardens, and how that ties into their culture and their literature and took a lot of pictures and made that into the PowerPoint presentation and then from that they kids made their own Oriental or Japanese garden, just as a project for fun to apply those concepts. I use a lot you know united streaming there's a lot of things on United streaming to use, some books and worksheets to help teach the difference between a static character in a dynamic character from a kids book. I use a lot of kids books to teach from. Their short, to the point, and get the message across. But as far as what I use the computer for, that really covers it generally. As far as the kids, I don't know how much they use it for actual studying. I have not seen any greater, ... how do I say this, ... I haven't seen any greater proficiency on tests like with these phrases of the week. I know kids don't learn well from lists, I learned that from foreign language. I think an external thing like flash cards helps them better in the studying process, than having it on the computer. I think the computer can give them immediate feedback whether their answer is right or not, but so can a flash cards. Like these many many phrases of the week, we go through them periodically and they can put the ones they know in one pile and the ones they don't and another, and then they can focus on the ones they don't. But as far as what I am familiar with, on the computer you can't just focus on the ones that you don't know and I think that kind of inhibits learning when he have to dilute all the ones you don't know back in the ones that you do.

**Comment:** By choice? This reinforces the issue of access to technology and the familiarity and comfort with it - - notions of the digital divide or acceptance as a digital immigrant?

**Comment:** When laptops are open and running within the classroom, T. "vultures over their shoulders" - - pedagogy is highly teacher-centric

**Comment:** This is a way that T. has utilized the laptop technology in the past - - again enforcement regarding the focus is on structure and teacher-centric instruction regarding technology

**Comment:** An opinion of the teacher's. Vary wary of laptops and how students choose to use them.

**Comment:** There does not seem to be a correlation between laptops and increased proficiency within content within this particular classroom. - - at least according to the T. - - however, from observations there does not seem to be must integration or implementation of the laptops and associated laptop technology, so this might not be an accurate inference.

**Comment:** Reinforces the notion that same instruction is being employed - or could be employed - within new packaging (old wine new bottle analogy)

Excerpt of Transcripts from Senior Large Group Interview 2.27.08

Researcher: Thank you for coming today. I'm still trying to learn names. I have seen names on a sheet of paper, and now I'm going to put faces with everyone. Today, I just want to get your perspectives and your ideas. It is far more important for you all to talk, than for me to talk. I'll just guide our discussion through questions. So, if you could go around say your name and your favorite thing to read in one way you use the laptops, that would be great. Okay? Who wants to start?

NAME, I like to read mysteries, my favorite computer program is **garage band** [c] **Comment:** Specific software - - could be used for either recreational or academic purposes or both

I'm NAME and I like to read the classics usually for books, and I like to use my computer for **face book** [c] **Comment:** Social networking - - recreational purposes

I'm NAME I like to read whatever I like to use it to check my **e-mail** [c] **Comment:** Personal efficiency

I'm NAME and I like to read magazines, and I use my computer for **e-mail** [c] mostly. **Comment:** Personal efficiency

I'm NAME I like to read magazines I guess, I like using my computer for **pictures** [c] **Comment:** Recreational purposes

I'm NAME I read a book now and then, I use my computer mostly for **musi** [c] **Comment:** Recreational purposes

I'm NAME I like trade magazines I use my computer for the **internet** [c] pretty much. **Comment:** Recreational or Academic purposes - - hard to know

I'm NAME I don't read much. I like to **play game** [c] (room erupts in chucking laughter) **Comment:** Recreational purposes

My name's NAME I like to read magazines mostly, I use my computer to **take note** [c] sometimes. **Comment:** Academic purposes

NAME magazines as well, and **game** [c] **Comment:** Recreational purposes

NAME and I read magazines, and mostly **e-mailing** [c] **Comment:** Personal efficiency

NAME magazines and **internet** [c] **Comment:** Recreational OR academic purposes - - hard to know

NAME just any book and I like to use it for **musi** [c] **Comment:** Recreational purposes

NAME magazines and probably **musi** [c] **Comment:** Recreational purposes

Researcher: And when you are saying magazines, . . . like the hardcopy magazines or like the zines on the Internet, or both? Response: Both [c] **Comment:** Magazines seem to be a popular way to read - - with the combination of hard copy magazines and ~~zines~~, likely reading for enjoyment or recreational purposes rather than for academic purposes?

NAME I like to read news a lot and I like to listen to **musi** [c] on it **Comment:** Recreational purposes

NAME I like to read a variety of everything, not very often, I like to use it for **photos and editing and musi** [c] **Comment:** Recreational purposes

**Appendix J - Sample Data Analysis regarding Content Area  
Literacy**

## FIELD NOTES

Date: 4.28.08

### Setting/Context

Teacher: Ms. Thompson

Subject: Earth Science

Class Period/Duration: 9:00 – 10:00

### Descriptive Notes

### Reflective Notes

- T. asks how many S. have completed their homework and turned in the WS onto Moodle - - several have not
- T. projects the textbook onto the white board
- T. has assignments put onto PowerSchool so that students can access the WS and assignments and class notes
- T. has to enlarge the view to 125% in order for students to be able to read the text and from the back row it is very small for me to see - - and not all of the "page" is able to be shown
- T. and S. work together to complete the Ch. 8 WS packet - - 4 pages copied front to back
- Questions are knowledge based and require students to find the answer in the text and write it into the WS to complete the write answer
- First part of the packet guards the vocabulary and defines the words through a cloze passage
- Next section matches the words with their statements that best fit
- T. asks what strategy we are using - - A. says guess and check - - T. says yes but we are also doing the ones we know first and then going back to the harder ones
- The digital text looks like it would in a hard copy text, the format is different but overall the layout/design is the same
- T. asks some questions (What do we do to make the ground unstable, contribute to mass movement - - looking at a picture from the digital text and asks the question to S. - - S. seem to struggle for the answer) - - what are some other ways??? mining, rock quarries, making roads, construction

Good to guard vocabulary so that other reading and assignment completion is more successful

Helps students work on "test taking" strategies? - - process of elimination

Encouraging higher order thinking - - comprehension/application, even a little analysis - - using the picture to spark students and use their visual literacy in a way to see what is going on in the picture so that they can answer the question being posed

**Comment:** This seems to be redundant doing the same thing uploading and making available the same documents between Moodle and PowerSchool

**Comment:** Characteristic can be used to support struggling readers - - making text easier for students to see - - however since not all text is on the page, could be a hindrance by tracking text and in this way could be more challenging for some struggling readers

**Comment:** Worksheet is done after the reading task - - post reading

**Comment:** Post reading activity - - questions are geared towards comprehension of content

**Comment:** Post reading activity - - supports vocabulary development of content from text

**Comment:** Post reading activity - - supports vocabulary development

**Comment:** Post reading activity - - supports the comprehension of content but also supports students reading comprehension for upcoming reading tasks by activating schema

### Excerpt of Transcripts from Individual Interview with Mr. Smith

Researcher: Do you think that having the laptops has changed how you might have otherwise taught? Obviously, we're talking hypothetically. If you had gotten a job, that didn't have as much technology, do you think your instruction would have been different?

Smith: I know I still would have done PowerPoints. When I first came here, they didn't get the laptops till middle of the first semester. I was lucky enough to get one. I kind of begged for one. But before I had mine, I still had my PowerPoints. I just had to hook it up to my desktop computer. It was kind of a hassle, and I had kids just take notes with paper and pencil which was just overwhelming, because there's so much information that I want them to have. So I really had to step back and kind of use guided notes or I would type the PowerPoint out, and then give it to them so they can follow along and write in the other part(s). You know, I definitely would not have been able to get through as much material as I have been able to, without the computers.

**Comment:** This setting in which Mr. Smith refers to as being a "hassle" is what many teachers are doing currently to utilize the laptops and accompanying technology within the classroom

**Comment:** Provides support, and scaffolds to students in order to be successful within the content - during reading supports

**Comment:** Positive perception overall regarding the laptop initiative and it's impact upon curriculum and instruction

Researcher: How do you think the laptops, and the resources that have been made available because of the laptops, have changed how and what is read in your classroom?

Smith: Like I stated earlier, it just allows you and allows them to learn so many ways that the main job of the teachers is to find which way each kid learns best. And with a laptop, and with PowerPoints, and different things like that, more technology allows each kid to find their own little niche on how they want to learn. I think the textbooks become, in a way, something of the past. And the science department, they put their textbooks online now, which is great because then you can access your textbook anytime you want. And now, we are going to be putting our lesson plans online. So it's a double edge sword, you got to keep caught up and have everything out there, but at the same time, it allows parents to see what's going on that week. It allows students to check what they've missed. Maybe because in a small school they are involved in everything, so it's hard for some kids to keep caught up. So technology has really allowed us to kind of get to the forefront and allow not just teachers and students, but everyone in the district to be involved in what's going on in the school, which is nice. At the same time, there're some things, which you might like if they'd stayed in your classroom, than being put out there on the web, or parents knowing about different things...but that's how it goes.

**Comment:** Notes how text read upon the laptops, and the digital text in the sciences, supports a connection between the reader and the text, allowing for individualization

**Comment:** Implications to the closing of the digital divide regarding access to technology

Excerpt of Transcript from Freshman, Sophomore, & Junior Group Interview

Student 1: When I think literacy, I think of reading in general, like you can read.

Researcher: How have the laptops influenced what you read, and how you read?

All: Our biology books on there.

Researcher: Do you like that?

Girls: No, not really.

**Comment:** The girls of the group are in agreement that they overall, they don't like the digital textbook format. - - The boys of the group seem more indifferent and refrain from responding...yet.

Researcher: Why don't you like it?

Student 3: It drains your battery so bad.

**Comment:** Issue not with the reading and the format, but the consequences it has upon the tool, the laptop that is required for learning in other classes as well. If students were to read their digital science text a lot and then have to use the laptop during the other classes of the day, they would likely have to charge it midway through. This might be one of the reasons that students prefer to utilize the hard copy of texts when available.

Student 4: It's really hard to read on a computer screen; it's a lot easier to read in a book.

Researcher: Can you make the text larger, or highlight it, or cut and paste things?

Girls: You can't cut and paste, but you can highlight things.

**Comment:** Becomes an issue of ease in reading and preference of the reader - - the connection between reader and text.

Student 3: You can't just open it to a certain page; you have to scroll through it.

**Comment:** Focus is on locating and finding information or a particular page/section.

Researcher: So is it like a PDF document?

Student 2: It's like Adobe flash reader.

Student 5: It's going to your table of contents, and then you can go to the chapter, and then through the pages within each chapter.

**Comment:** Again focus is on finding information and locating particular pages/sections. There seems to be a certain amount of exasperation with all the "steps" involved to get to where you need to be.



## **Appendix K - Sample of Data Analysis regarding the New Literacies**

## Sample of Student Survey

1. What grade are you in school? (Circle/highlight one)

Freshman      Sophomore      Junior      **Senior**

2. List all the ways in which you use your laptop while in school.

- Type paper[s] Comment: Academic purposes
- Lab reports in science class[s] Comment: Academic purposes
- Download and organize my picture[s] Comment: Recreational purposes
- Store my music on iTunes[s] Comment: Recreational purposes
- Check my email/communicate with people[s] Comment: Maintain personal organization, efficiency -- communicating with people is associated with email but also listed separately -- possibly includes social networking sites -- this communication with others could support **the new literacies**
- Get news articles for government[s] Comment: Academic purposes -- supports reading in **the new literacies**
- Do other school related projects/research[s] Comment: Academic purposes -- supports reading in **the new literacies** and potentially encourages **critical literacy**
- To do lists using sticky notes/reminder[s] Comment: Personal organization and efficiency
- Calendar using iCal[s] Comment: Personal organization and efficiency
- Do creative projects for classes such as in House Training[s] Comment: Academic purposes
- Yearbook page[s] Comment: Academic purposes

3. How have the laptops impacted the reading you do in classes?

They haven't really had a big impact on the reading that we do in classes. **We still use books to do our reading except for in physics we have our textbook on a CD (which I personally don't like)**

4. What is the most exciting class assignment you have been given using your laptop? Please explain.

The most exciting class assignment that I have been given using my laptop would probably be **creating fun posters or other documents in In-House Training. I have learned to love the InDesign program and use it all the time. I also enjoy Yearbook and creating multiple pages for the yearbook. Basically I just enjoy doing anything creative on my computer.** 😊

5. What do you like/dislike about having laptops to use in school?

**I like how we're involving technology into our classrooms. There are endless opportunities and projects to do with a laptop.**

Comment: Ability to navigate and effectively utilize this software could support **new literacy skills**

## FIELD NOTES

Date: 2.20.08

Setting/Context

Teacher: Mr. Smith

Subject: US Government

Class Period/Duration: 9:00 – 10:00

Descriptive Notes	Reflective Notes
<ul style="list-style-type: none"> <li>▪ 17 students, 11 girls/6 boys</li> <li>▪ 6 students have their computers out and open, the Internet running</li> <li>▪ Begins by doing current events, those whose day it is "to do current events" print off their event</li> <li>▪ As T. walks to front of class, all students get their computers out and open -- M. what's wrong with you? -- gg, feeling well? -- wll, you still need to have your computer out and open</li> <li>▪ Some students have Internet open, others email, one girl has online game open, others have an open empty word doc</li> <li>▪ T. has powerpoint on Presidency -- as slides advance, students type notes into word doc on iBook</li> <li>▪ T. has trivia questions embedded into PowerPoint and slides...asks students to not look up the answers just make a guess for now</li> <li>▪ To advance slides, T. has a wireless remote with a laser to use to point to things on the screen...allows T. to move around the room, which he does</li> <li>▪ The one student who is playing an online video game toggles back and forth between her notes and the game...as T. talks she plays...otherwise she takes notes when others do too...some notes are sparse others are more verbose</li> <li>▪ T's slides are not loaded with text -- give the main points then discusses points by expanding upon them, connecting it to their lives/ their frames of reference, and/or provides an example</li> <li>▪ The format of student notes vary, some are in bullets, others are as a narrative, others are in outline format</li> <li>▪ T. computer with presentation freezes, tells students to "hold tight" -- some students search internet, girl is playing her game, some are thinking of baby names for T. new baby (Bonus ... for the tax write off) -- others close the iBook, others just wait</li> <li>▪ T asks "Who has their Internet up?" find out what our national deficit? -- T. guides the students by saying there is a site that is like a ticker and keeps tabs on it... One student finds the answer, shares it out and all move on -- transaction happens within 30 seconds</li> </ul>	<p>Instead of printing off current events, could they be projected and or have all navigate to the same site and "report it"</p> <p>Comment: Student have to locate a current event to present/share with the rest of the class. Some students seem to take the headlines from the Yahoo or MSN popup browser -- fostering basic levels of the new literacies, yet NOT encouraging critical literacy -- students are having to locate and report information to others</p> <p>Comment: Technology within this classroom allows for flexibility for movement within the classroom, and ease in classroom management</p> <p>Comment: Student seems to shift between ontask and offtask behaviors -- is she able to attend to classroom activities while playing the game? -- would she have been off task anyway if there was not the technology available?</p> <p>Comment: Models new literacies skills and general presentation skills regarding usage of PowerPoint</p> <p>Is there a difference in student performance by how they organize their notes?</p> <p>Provides just in time learning - and fosters new literacy skills</p> <p>Some students toggle between game and notes, internet and notes...Are students able to multitask and manage both? screens while still focusing on</p> <p>Comment: Provides the just in time learning for students to enhance their knowledge and understanding about a subject -- T. provides the question to be answered, but S. locate it, verify it's accuracy, and share information with others in the class</p>

## **Appendix L - Sample of Data Analysis regarding Critical Literacy**



Excerpt of Notes from an Informal Conversation/Interview with Ms. Hamilton

Really thinks that district needs a reading specialist because HIS teachers are not trained to teach reading and there are a lot of our students that are really low...nothing can be sent home to read independently and can expected to understand it, so we read in class together

**Comment:** There is a lack of agency on the part of the teacher that she has the knowledge base necessary to support the reading of students

I am more of a writing person

In writing she finds that students are verbose and don't get to the point, use the thesaurus and insert a word that is "impressive" but it loses their voice and does not express what is wanted...when editing, students don't edit as thoroughly/completely on the computer...therefore prefers hand writing papers

**Comment:** The computer has become another tool in which to accomplish the same means - - the old wine new bottle analogy

Policy is that students are not allowed to get on email during school hours - - but will take their computers into the bathroom...we're not dumb...we know that they are getting on to sites they are not supposed to

**Comment:** Seems to have an overall negative perception of the laptops and how the laptops are being utilized by students - - a concern for their misuse

Kids "cheat" will text/ IM each other during a test...sharing answers...or get on sites that they shouldn't be on when they are supposed to be recording their phrase of the day - - some of the brightest kids will do this... "it'd really surprise you" - - \*\*maybe it because these brighter kids have already "gotten it" and are wanting to keep productive

I want to get the students thinking so I don't do a lot of the computer, because I want them to do the thinking - - to think critically and analytically

**Comment:** Straight forward portrayal of her perception regarding critical literacy - - critical literacy is independent of the laptop technology

Seniors read/do a novel the first quarters of school and then they do a research project that ties into it in the 4<sup>th</sup> quarter...has students do a powerpoint along with an oral report

**Comment:** Sharing this in the

Says that the intent of the laptops was to draw students to the school...increased enrollment...in her opinion has not happened at all

## **Appendix M - Sample of Member Checking Verification Form**

## Member Checking Verification Form

**What is member checking?** It is asking participants within the study to share their views on interpretations being made by the researcher, me, to validate that the analysis is on target (Creswell, 1998).

---

Greetings and how are you?

Please read and review the attached document. I would like your views, opinions, and perceptions on my initial interpretations of data that has been collected to this point. You can make your comments on this sheet.

If you have any questions or concerns about this please don't hesitate to contact me. I can be reached via email at [leahmar@su.edu](mailto:leahmar@su.edu), or by phone at 785-539-4017 (home) or 913-484-7087 (mobile).

Thank you for all your help!

Sincerely,  
Leah

---

Comments: (please attach pages if extra space is needed)

*Leah, this is all quite true. As I read through the first page "Initial Interpretations" I knew exactly who each us were and recognized your ability to create balance.*

*Nicely done on your part, I just hope you are not too disappointed in your research subjects: us!*

I have read and reviewed the attached document. The initial interpretations that have been made reflect the data analysis, at its current stage, is on target. I have written any comments that I feel need to be made in the space above. I support the direction of this data analysis.



## Initial Interpretations

Compiled April 29, 2008

The technology/laptop usage from classroom to classroom varies significantly. However, as a school the instructional evolution would likely be classified within the adoption phase (Sandholtz, Ringstaff, & Dwyer, 1997). The adoption phase of the instructional evolution in technology-rich classrooms is characterized by keyboarding, the use of word processors for writing, the use of computer-assisted instruction (software for drill and practice of basic skills).

Instructionally, students are using their computers for word processing, searching and finding information on the internet, and taking notes. There are concerns from some teachers regarding how much time students spend using the computer for “recreational” purposes, such as emailing, playing games, and visiting sites such as FaceBook and YouTube. Some also share concern that students may either not be or having trouble focusing on their work and school when presented with the distractions that the laptops can offer.

Some students share that they can focus more when they are listening to music as they work. Some share that they are being efficient with their time when they are for example checking their email during a lull in a lesson. Students have shared that computer usage is very dependant on the teacher and how they use it. In addition, students recognize that each of them (students) have a unique way and preference in which they learn; therefore, students appreciate it when the classroom learning environment is flexible and accommodates different learning preferences.

Within the classroom, students are encouraged to use the laptops as a tool to learn from, another tool within the instructional repertoire. Some teachers express concern that students still need to work on thinking critically, and that this skill needs to be developed before being “turned loose” on the open internet. When searching on the internet, students are encouraged to find and locate the answer to a predetermined question. There is not an emphasis on communicating answers with others or collaborating with others while collecting research.

Teachers in the school exhibit different pedagogical practices of education. Some teachers are geared more towards teacher-centered instruction; others balance teacher-centered with student-centered instruction. Within classrooms, there is some direct instruction, and some project-based learning. School-wide, there is little cooperative learning.

There are mixed perceptions by both teachers and students regarding the laptops. Some students couldn't imagine not having laptops to use, while others perceive that if they didn't have their laptop it wouldn't make a significant impact on what or how they learn in their classrooms. Some teachers have shared that they believe that having mobile labs might be better than having one-to-one laptops. Other teachers can't perceive teaching within a room or district that did not have the amount of technology that is currently available, especially with the one-to-one laptop program.

## **Appendix N - Likert Scale Survey Template**

Good morning!

Thank you for taking a little time this morning to talk with me and continue to share with me your thoughts, views, opinions, and perceptions. I appreciate it!

---

Please read each question, and circle the response best aligns with your thoughts and views. I welcome any additional comments you may want to share, use the back of your page if necessary.

1 = Not important at all  
2 = Somewhat unimportant  
3 = Indifferent/Neutral/Unsure  
4 = Somewhat important  
5 = Very important.

1. How important is it for students to be able to compose and edit digital texts?  
1            2            3            4            5
2. How important is it for students to be able to read and interpret print and online texts?  
1            2            3            4            5
3. How important is it for students to be able to interact within a global audience?  
1            2            3            4            5
4. How important is it for students to be able to be able to recite and recall information and facts when asked?  
1            2            3            4            5
5. How important is it for students to be able to problem solve and work collaboratively?  
1            2            3            4            5
6. How important is it for students to be able to critically judge and evaluate information and resources?  
1            2            3            4            5
7. I teach \_\_\_\_\_ (please write in your subject ☺).

THANK YOU!!!