ABSTRACT

TAGSOLD, JENNIFER TINGEN. Student Distraction in a 1:1 Learning Environment. (Under the direction of Lori Holcomb McClaren).

K-12 education research has become increasingly concerned with technology’s impact on students’ attention in the classroom, particularly with regard to laptop computers and other mobile devices (Gay & Hembrooke, 2004; Jackson, 2008; Mann, 2008; Kraushaar & Novak, 2010). While this classroom technology has created many positive implications for teaching and learning, few scholars have examined specific, practical approaches students and teachers use to avoid distraction. Through qualitative data analysis methods, this study examines the strategies used by students and teachers to avoid distraction in a high-tech learning environment.
Student Distraction in a 1:1 Learning Environment

by
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A dissertation submitted to the Graduate Faculty of North Carolina State University in partial fulfillment of the requirements for the degree of Doctor of Philosophy

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DEDICATION

For Steve: God gave me you.
Jennifer came to the Triangle as a freshman at NC State and has lived in the area ever since. She recently got married and lives with her husband, Steve, in Raleigh. She is from Oxford, NC, and visits her beloved family often. In her free time, Jennifer enjoys working out, reading, piano, hiking, traveling, and serving with her church. Jennifer received a B.A. in Communication in 2005, and a M.A. in English in 2007. She has worked as an adjunct instructor at various colleges around the Triangle.

Jennifer is grateful to be a part of the evaluation team at The William and Ida Friday Institute for Educational Innovation, working on projects such as the North Carolina Learning Technology Initiative, IMPACT Model, Vance Schools 1:1 Learning Initiative, and Race to the Top. During this time, Jennifer also served on the editorial board of *Meridian Online Journal* and as president of Kappa Delta Pi International Honor Society in Education. Her research interests include distractive technologies, online education, and 1:1 learning.

Jennifer has loved to learn for as long as she can remember, and is thankful for those exceptional teachers who made learning fun, from preschool to graduate school. She recalls annoying her sister, Jessi, when interrupting play time outside so that their most important teacher - their mother - could come inside and listen to Jennifer read. Jennifer began the doctoral program in 2008 and will graduate in May 2012 with a Ph.D. in Curriculum and Instruction with an emphasis in Instructional Technology.
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“So then, let us not be like others, who are asleep, but let us be alert and self-controlled.”

1 Thessalonians 5:6
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CHAPTER ONE: INTRODUCTION

Sam has been using his new laptop for two weeks. He appreciates the shiny new tools available to him and gets a kick out of watching his teachers figure out how to use technology, but he finds himself constantly distracted. "Here Mr. Williams, I'm returning my laptop because I'm not getting any work done; if it's not here to distract me, I will be able to pay more attention to what you say in class."

Mr. Williams enjoys having total access to myriad teaching tools through the new 1:1 laptop initiative, but he also has to learn to monitor his students. As his teaching became more tech-savvy and more directed at 21st century skill development, Mr. Williams develops a new goal: become more interesting than all the distractions available on his students' laptops. After all, if Facebook is more compelling than his lesson, what kind of teacher is he? Surely he can compete with social networking and other online activities…but how?

As a research assistant on a project that evaluates the 1:1 computing initiative in North Carolina schools, I have learned through surveys, interviews, focus groups, and classroom observations that most students easily adapt to the use of laptops in the classroom and experience positive effects on their entire learning experience due to laptop access (Bebell, 2005; Corn, 2009; Great Maine Schools Project, 2004; Lane, 2003; Lowther et al., 2007; Silvernail & Lane, 2004; Warschauer, 2006). One primary issue that keeps arising, however, is that of distraction. Teachers and students agree that monitoring software is excellent for helping students stay on task, which leads to a discussion of their struggle with distraction both in and out of school. This study seeks to enhance the field of instructional technology by exploring strategies that students and teachers use to maintain a focus on teaching and learning in a 1:1 environment when so many other options are available to distract the minds of the learners.

Nagel (2010) notes that 37% of school districts in the United States have implemented some form of 1:1 computing. Research defines a 1:1 initiative as providing every student and teacher with a personal digital wireless device with up-to-date software
and access to the Internet at school (Penuel, 2006); and, a focus on using laptops for teaching and learning to meet certain goals (Muir, Manchester, & Moulton, 2005) such as increased equity of access to technology, transformed quality of instruction, increased student engagement, improved academic achievement and technology literacy, increased economic competitiveness, and enhanced home-school connection. When a school district decides to implement a 1:1 initiative, students often discover that while laptops can enhance learning, they can also be a distraction during class.

Despite the positive impacts 1:1 initiatives can have on attendance and academic gains, there have been some reported drawbacks associated with these endeavors (Fried, 2008; Mathiasen, 2004). Some teachers have found that 1:1 immersion has negative effects on student behavior (Shapley et al., 2008). Teachers in one laptop program are concerned that the laptops are distracting and reduce student attention. They are dissatisfied with the lack of student adherence to acceptable-use policies and have difficulty getting students to bring their laptops to class (Mann, 2008). A lack of evidence of positive impact on learning combined with student misuse of laptops (e.g., cheating on tests, downloading pornography, and hacking into school and local business networks) can negatively impact a 1:1 initiative and the community surrounding it (Holcomb, 2009). Since students are reading, playing, messaging, and learning on the Internet now more than ever, research is needed to examine the impact of distractive technology on student distraction in a 1:1 environment.

Despite the positive and negative aspects of 1:1 learning, one cannot debate the alignment of laptop initiatives with the National Educational Technology Standards for Students (NETS*S). The National Educational Technology Standards (NETS) Project was
first launched by the International Society for Technology in Education in 1998 as a response to the need for national technology standards. The primary goal of the NETS is to enable stakeholders in PK–12 education to develop national standards for educational uses of technology that facilitate school improvement. The NETS also help measure proficiency and set goals for what students (NETS*S), teachers (NETS*T), and administrators (NETS*A) should know and be able to do with technology in education (International Society for Technology in Education, 2010a). The NETS*S focus on higher-order thinking skills and ensuring that students can effectively participate in a digital citizenship. Major tenets of the NETS*S include:

- Creativity and Innovation
- Communication and Collaboration
- Research and Information Fluency
- Critical Thinking, Problem Solving, and Decision Making
- Digital Citizenship

These skills align closely with those of the 21st century skills movement. The Framework for 21st Century Learning illustrates a view of learning in the 21st century that is focused on: student outcomes (life and career skills, learning and innovation skills, and information, media, and technology skills) undergirded by support systems such as learning environments, professional development, and curriculum design (Partnership for 21st Century Skills, 2003). The six major tenets of 21st century learning are:

- Emphasize core subjects
- Emphasize learning skills
- Use 21st century tools to develop learning skills
- Teach and learn in a 21st century context,
- Teach and learn 21st century content
- Use 21st century assessments that measure 21st century skills. Partnership for 21st
Understanding 21st century skills is essential for today’s high school graduate. The 21st century skills framework will be referenced throughout this study as I explore the topic of student distraction in 1:1 learning environments.

**Topic and Purpose**

This qualitative study will address strategies students and teachers use to avoid student distraction in a 1:1 learning environment. The purpose of this study is to explore participant views with the intent of understanding how students and teachers manage distraction in a 1:1 environment. The study explores teacher and student self-regulatory experiences by collecting interview data with a sample of four English language arts teachers and four students per teacher at one North Carolina high school currently implementing a 1:1 initiative.

**Statement of Problem**

K-12 education research has become increasingly concerned with technology’s impact on student attention in the classroom, particularly with regard to laptop computers and other mobile devices (Gay & Hembrooke, 2004; Jackson, 2008; Mann, 2008; Kraushaar & Novak, 2010). While this classroom technology has created many positive implications for teaching and learning, few scholars have examined specific, practical approaches students and teachers use to avoid distraction. There has been no study to date examining the distraction management strategies used in both honors and traditional English language arts courses participating in a high-quality technology initiative (Mollette, Overbay, Corn, Townsend, & Townsend, 2011).
Methods Overview

The researcher follows the multiple-case study design, a commonly used method for studying school innovation (Yin, 2003). The study answers the question, “How do students and teachers manage distraction in a 1:1 environment?” through qualitative methods, including interviews and classroom observations completed on location in the school environment. Sub questions include:

1a. How do English IV students manage distraction when working with technology?
1b. How do English IV teachers help students manage distraction when working with technology?
1c. How do these experiences differ based on achievement level (honors vs. non-honors)?

Data analysis will include thematic content analysis (Creswell, 2007) in which the researcher will categorize and distill from the data a list of common themes that reflect the experience of all participants.

Definition of Terms

*Distraction*: source of reduced attention in class that can lead to negative effects on student learning and behavior (Mann, 2008; Shapley *et al.*, 2008)

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

Significance and Limitations

This study seeks to enhance the field of instructional technology by exploring strategies that students and teachers use to maintain a focus on teaching and learning in the
1:1 environment when so many other options are available to distract the minds of the learners. This study contributes to a deeper understanding of the distractive nature of laptops in the classroom. Through qualitative data collection and analysis, this study expands the field of instructional technology and can potentially increase the effectiveness of teachers and students so they may excel in school. By employing the techniques that students say work best for avoiding distraction, teachers can hypothetically prepare their students for a lifetime of uninterrupted learning.

This study has several limitations. First, due to the qualitative nature of the study, the researcher will strive to maintain a constant awareness of her own perceptions and beliefs throughout the research study (Merriam, 1998). Next, the data collected here is self-reported and lacks a comparison group. Finally, the study presents a lack of generalizability because all participants are a part of the same technology model within the North Carolina education system. Although such limitations exist, the researcher will make every effort to provide a thorough analysis of data-supported findings.
CHAPTER TWO: LITERATURE REVIEW

Benefits and Drawbacks of 1:1 Learning

The aim of this study was to discover ways in which English IV teachers and students manage student distraction in 1:1 learning environments. Because of digital media’s impact on learning styles, researchers must examine the fruits of laptop initiatives and how these help student navigate the non-linear world of the Internet and its similarities to the “associational network of human long-term memory” (Dede, 2005, p. 5). There are numerous factors that play a role in 1:1 learning, particularly with regard to distraction avoidance. A brief history of 1:1 computing will provide the reader with a clear picture of the evolution of this 21st century learning environment.

There have been numerous lessons learned from research conducted around 1:1 initiatives over time. Rockman, Chessler, and Walker (1998) discovered that students with laptops spent more time using computers, were likely to use their computers more in public school than private school, did more collaborative work, had higher quality writing, experienced improved critical thinking, and took on different roles (along with teachers). Cuban, Kirkpatrick, and Peck (2001) sought to explain why so many high-tech schools have low technology usage, which remains an issue to this day (particularly for initiatives in their early stages). Findings indicate that most teachers used the technology infrequently and in limited ways due to four factors: historical legacy of teaching high school as we know it, limited time, the way the school day was structured (six periods per day), and defects in the technologies (Cuban, Kirkpatrick, & Peck, 2001). One of the first major 1:1 projects was carried out in Maine, when every student in the state received a laptop. Silvermail & Lane
Bonifaz & Zucker (2004) sought to examine how the laptops were being used, the impacts of the laptops on teachers and students, and obstacles encountered in implementing the laptop program, leading researchers to discover that although student learning increased and improved, issues with professional development arose due to lack of sufficient time for teachers to learn technical skills for using laptops. Bonifaz & Zucker (2004) culled lessons learned from laptop initiatives around the country and established that aligning technology policies and supports with goals, building strong leadership at all levels, developing solid partnerships both inside and outside the school system, thinking about funding for the long term, planning logistical details carefully, providing professional development that focuses on curriculum integration and not just technical skills, training parents on basic technical skills and informing them about rules/policies involved, providing necessary infrastructure and digital content, managing change, and monitoring and evaluating the initiative are essential pieces of the 1:1 learning puzzle. Penuel (2006) found that teachers’ attitudes and beliefs, along with infrastructure, play a central role in how and when teachers integrate computers into their instruction. As 1:1 initiatives expanded across the country (and world), researchers became more and more interested on technology’s impact on student achievement, particularly with testing demands being made on teachers. Lei & Zhao (2007) found that three hours per day of technology use was a critical point; the more time students spent on computers, up to three hours per day, the more their GPA increased. Differences in GPA gains and losses support the notion that the type of activities teachers use affects achievement. A review of educational research literature helps to provide the reader with a glimpse of the current
knowledge base regarding learning in high-tech environments where online distractions are an everyday occurrence.

A discussion of the positive and negative components of 1:1 learning will help reveal some of these fruits. Positive outcomes of 1:1 learning include enhanced student learning and engagement (Bebell, 2005; Great Maine Schools Project, 2004; Lane, 2003; Lowther, Strahl, Inan, & Bates, 2007; Silvernail & Lane, 2004; Warschauer, 2006), motivation (Harris & Smith, 2004; Mitchell Institute, 2004; Silvernail & Lane, 2004), achievement (Cavanaugh, Dawson, White, Valdes, Ritzhaupt, & Payne, 2007; Lowther et al., 2007), attendance (Harris & Smith, 2004; Lane, 2003; Silvernail & Lane, 2004), discipline (Corn, 2009; Silvernail & Lane, 2004), and 21st century skills (Cavanaugh et al., 2007; Corn, 2009; Lowther et al., 2007; Mitchell Institute, 2004; Shapley et al., 2008). Results from 1:1 initiatives have also shown an increase in students’ math and writing skills (Bebell, 2005; Warschauer, 2006). Classroom teachers report benefits of 1:1 learning such as improved technology knowledge and skills, increased assistance with technology questions and problems, and improved classroom management (Fairman, 2004).

Although some results of 1:1 laptop initiatives show improvement in student learning and teacher use, factors other than the distribution of laptops contribute to successful implementation. There is evidence that laptop initiatives do not increase all test scores, especially when tests are administered in paper and pencil form (Warschauer, 2006; Weston & Bain, 2010). Other drawbacks of 1:1 learning include distraction and reduced attention (Mann, 2008), student misuse (Holcomb, 2009), physical discomfort leading to a need for ergonomics training (Fraser, 2002), and lack of teacher and student technical skills (Corn,
Halstead, Tingen, Townsend, & Campbell, 2010). Teacher support, instructional use, technology support, infrastructure, and quality of implementation are influential in the success of a 1:1 initiative (Weston & Bain, 2010). In 1:1 laptop initiatives, students are provided laptops for educational use; however, the schools must have the capabilities and strategies for the laptop use to be effective (Warschauer, 2006). This includes technology support, resources, and strong leadership guiding the programs (Kleiger Ben-Hur & Bar-Yossef, 2010; Maninger & Holden, 2009; Silvernail & Lane, 2004). By discussing three important realms of 1:1 learning, one may realize the intricate nature of teaching, learning, and assessment involved in laptop initiatives.
Figure 1.1. Literature Review Logic Model.
1:1 Learning and English Language Arts

Researchers have shown that English language arts instructors are continually one of the forerunners in high usage when schools implement laptop initiatives (Corn, 2009; Corn, Halstead, Tingen, Townsend, & Campbell, 2010). Unfortunately, there has not been a great deal of research on 1:1 learning and its effects on English language arts classes. There is, in fact, a lack of research regarding technology integration in English courses in general (McNabb, 2005). Multiple studies have emphasized the effect of 1:1 learning on learning English as a second language (Towndrow & Vaish, 2009; Yang & Huang, 2008; Lin & Wu, 2010). Yin and Wu (2010) found, for example, that netbooks encourage the instructor to design more innovative learning activities, provide students with more opportunities to practice listening and speaking, and increase engagement and confidence in learning a new language (Yin & Wu, 2010). While this information is useful and complements the purposes of this research, it does not provide a great deal of useful information for the sought-after population of 1:1 English language arts students.

Along with a lack of research on 1:1 learning and its effects on English language arts classes, there is also a dearth of literature investigating high school laptop initiatives and their effects on high- and low-achieving English language arts courses. Wurst, Smarkola, & Gaffney (2008) examined laptop usage in university-level honors and traditional business classrooms and found that introducing laptops did not increase student achievement, satisfaction, or level of constructivist activities in the honors classrooms. Haynes (1996) conducted a study of laptop computers’ effects on middle school students identified as inhibited writers and established that students with laptops maintain more positive attitudes
toward writing, decrease the number of errors in grammar and style, and write longer passages (Haynes, 1996). The two populations in these studies (university-level and middle school) have frequently been used in 1:1 learning research and, like the English language learning population, complement the purposes of this research but still lack insight about the high school population that is sought.

**Instructional Practice**

Teachers involved in 1:1 initiatives tend to develop new instructional practices as they become more familiar with the technology. Rochette (2007) noted that once given a SMART Board and laptops, her teaching becomes re-energized and she is able to grasp the possibilities available when one operates with a “Why not?” attitude. Rochette began redesigning her lessons and discovered a renewed vision for composition, how to implement close reading of both literature and art work, and the benefits of blogging in an interdisciplinary American Studies class. Stories like Rochette’s are heard all across the country as teachers realize the level of engagement that is possible when they include digital media and laptops in their lessons (Corn, 2009). Other fun activities for which English teachers use their laptops include digital storytelling (Lambert, 2002); engaging multimodal texts to enhance reading comprehension (McKenna, 1998); creating student election commercials (Curtis, Merry, & Walker, 2011); and utilizing Google Docs for improved writing (Pahomov, 2011). Rochette believes in teachers’ ability to "appeal to the visual and digital intelligences of students" (p. 45). Having digital literacy involves numerous skills such as knowing how to explore the Internet, finding necessary information, and sharing that information with others (Leu, Leu, & Coiro, 2004).
The concept of New Literacies has stormed English teachers the world over. Leu, Kinzer, Coiro, & Cammack (2004) define New Literacies as skills, strategies, and dispositions necessary to successfully use and adapt to the rapidly changing information and communication technologies and contexts that continuously emerge in our world and influence all areas of our personal and professional lives. These new literacies allow us to use the Internet and other ICTs to identify important questions, locate information, critically evaluate the usefulness of that information, synthesize information to answer those questions, and then communicate the answers to others (p. 1570).

Leu et al. (2007) admit that this definition will continually change; as new technologies appear, new literacies will emerge.

Labbo & Place (2010) provide practical advice for teachers who seek to integrate technology through a New Literacies framework. Key ideas include going on virtual field trips and taking WebQuests (Labbo & Place, 2010). This thoughtful article calls teachers to recognize students' technology funds of knowledge (the cultural technology knowledge base shared by many students) and how they can bring that knowledge into the classroom. Hebert & Pagnani (2010) add to this discussion by exploring different ways educators may engage gifted boys in New Literacies; they point out that due to boys’ different genre preferences and purposes for reading, activities such as oral history interviews with senior family members, creating an online museum of hometown history, designing Facebook pages for main characters in literature, designing a cross-country trip based on journeys characters take, or writing a song that captures characters' experiences can enhance gifted males’
English language arts experiences. This type of lesson can reignite learning for both teachers and students.

Researchers are acknowledging that video technology is here to stay and falls outside the typical domain of reading-to-write activities used in the English classroom. Pino-Silva (2007) discussed a listening-to-write task called the video-based short comment, an exercise that aids skills integration and critical thinking for English as a Foreign language (EFL) students. Another popular tool used in English courses and other subject areas from elementary grades through college is VoiceThread, a tool that allows users to create multimedia slide shows that utilizing images, documents, and videos and allows people to navigate slides and leave comments in five ways (Barnes, 2011).

The gap in literature addressing 1:1 computing in high school and English language arts reveals a need for further research. The study of technology’s impact on American students is imperative, particularly in a world where digital media encourages multitasking and includes “seeking, sieving, and synthesizing, rather than on assimilating a single ‘validated’ source of knowledge as from books, television, or a professor lecturing” (Dede, 2005, p. 4-5). Due to the fresh, multimodal nature of learning engendered by laptops, a study involving English language arts students within a high school implementing 1:1 computing is of the utmost relevance and significance for the field of instructional technology.

**Improved Teaching, Depending on …**

**Pedagogy**

Teachers’ beliefs mediate the way they use technology in the classroom, and if teachers do not support the initiative they are less likely to integrate the laptops into their
lesson plans (Antonietti & Giorgetti, 2006; Churchill, 2006; Ertmer, Addison, Lane, Ross & Woods, 2000; Penuel, 2006). In addition to school and district support, teachers should support laptop learning in the classroom and have access to professional development or tools to aid them in integrating laptops into lesson plans (Kleiger Ben-Hur & Bar-Yossef, 2010; Penuel, 2006; Silvernail & Lane, 2004; Weston & Bain, 2010). In his three-year study, Rockman (2000) found that teachers who use laptops report a statistically significant change in practice towards constructivist teaching when compared to matched non-laptop teachers. Fairman (2004) supported this notion in her state-wide MLTI study titled “Trading Roles: Teachers and Students Learn with Technology.” Fairman found that principals and teachers report an “increased use of an inquiry approach as opposed to memorization and practice; increased use of interdisciplinary or integrated approaches; increased use of cooperative or collaborative structures for learning and increased use of differentiated or individualized learning tasks” (p. 18). Teachers have shifted roles, moving from the sage on the stage who lectures to the whole class into facilitators and coaches (Cavanaugh et al., 2007; Fairman, 2004; Lowther et al., 2008). Professional development experiences can enhance teachers’ technology knowledge and skill level and therefore improve the use of laptops in the classroom as well as teacher attitudes toward the technology (Kanaya, Light & Culp, 2005; King, 2002; Maninger & Holden, 2009; Swan & Dixon, 2006; Swan, Kratcoski, Mazzer & Schenker, 2005). Teacher support is imperative with regard to successful 1:1 learning.

Teacher ambivalence is a common challenge for districts planning a laptop initiative. McGrail (2006) found that a key concern for teachers is standardized testing’s uncertain relationship with technology mandates, lack of agency in planning and implementing the
laptop technology initiative, and the amount of required professional development. In an examination of technology and pedagogy, McGrail (2007) established that negative outcomes resulting from the laptop initiative include social isolation, limited communication with a teacher or peers, and off-task behavior. Reasons for these outcomes include limited physical space, cumbersome furniture, poor technology infrastructure, and the largely instrumental use of technology in numerous learning engagements. Scholars from Singapore found that students rarely explore new media as alternative sources of legitimate knowledge and miss opportunities to investigate mobile technologies as sites for meaning-making and knowledge construction (Towndrow & Vaish, 2009). Ultimately, McGrail (2007) suggests that administrators address the physical constraints in each laptop classroom and enhance professional development so that pedagogy is a higher priority than technology, rather than putting technology before pedagogy. Teachers are challenged to design language learning and assessment tasks that embrace a wider set of twenty-first century skills (Towndrow & Vaish, 2009) and higher order thinking (Yang & Huang, 2008), rather than attempting to make yesterday’s teaching methods fit today’s technology.

Beliefs and Attitudes

An examination of teacher beliefs and attitudes leads to a more thorough understanding of their role in 1:1 learning. Mathiasen (2004) concludes a three-year study by saying, “From a pedagogical perspective, the question of whether teaching is enriched when all students have a laptop in front of them is debatable” (p. 289). Furthermore, Schofield (1995) discovered that when teacher goals and beliefs are not aligned with supporting inherent change, any purported transformative effects of technology use are greatly hindered.
Garthwait & Weller (2005) supported this research through a case study of two teachers which explored how teacher beliefs impact technology implementation. Overbay, Vasu, & Grable (2010) established that constructivist practices and beliefs are significant predictors of technology use in the classroom. Russell, O'Dwyer, Bebell, & Tao (2007) found that teachers who were new to a school typically use technology with students less frequently than teachers who have been at the school for three to ten years. This is likely due to the time it takes for newer teachers to adjust to the curriculum and school culture. Further, student use of technology during class does not significantly differ based on the number of years teachers are in the profession (Russell et al., 2007). Seglem (2009) discovered that rhetorical boundaries are embedded in the culture surrounding technology initiatives; when schools do not conform to traditional standards, the public often feels that schools are losing the qualities that make them institutions of learning. Seglem noted that the rhetorical boundaries are formed by three categories: perceptions of student behavior, perceptions of technology, and perceptions of school’s role in society. This same concept applies to technology initiatives because they do not conform to traditional methods of learning, teaching, or materials with which these are conducted. Issues such as these have led to numerous suggestions and programs for professional development in a technology-rich context (NC 1:1 Learning Collaborative, 2011). Teacher attitudes and beliefs have a profound impact on both teaching and learning in high-tech classrooms.

**TPACK**

Innovative teaching practices do not come easily or automatically. Koehler and Mishra (2008) combine technology, pedagogy, and content knowledge in their TPACK
model of teaching. Teachers have always had to adapt to new technologies; Plato, for example, believing the technology of writing would cause people not to trust their own memory, is just one example of the way humans have adapted over time regarding the implementation of new technologies. Koehler and Mishra seek to break down the false dichotomy between pedagogy and technology. Knowing about teaching does not exclude teachers from learning about and taking part in professional development so they may understand better and more relevant ways of teaching. In a similar vein, knowing about technology does not exclude them from continual learning about new educational technologies. Koehler & Mishra use the word “satisficing” because it is a combination of satisfying and sacrificing; satisfying a technology requirement, for example, may result in sacrificing part of a lesson plan (p. 11). Many 1:1 teachers know the true meaning of the word “satisficing” and have learned that it comes with the territory when one’s district rolls out a technology initiative. This perfectly represents the concept of accepting a solution because it is the best one can do under the circumstances.

**Student Learning**

Students report that laptops help them to take control of their own learning (Wooten, 2009) and help them learn 21st century skills, such as life and career skills which include self-direction and social skills (Corn, 2009). Laptop initiatives improve students’ ability to work independently and in groups, particularly those students who are at-risk or low achieving (Mitchell Institute, 2004). An essential skill for the 21st century is information, media, and information communication technology literacy (Partnership for 21st Century Skills, 2009). Leu, Leu, & Coiro (2004) assert that digital literacy involves numerous skills, including
knowing how to explore the Internet, find necessary information, and share that information with others. When a school begins a laptop initiative, digital literacy skills (or lack thereof) are some of the first, and most relevant, to surface. Skills such as these are necessary for students who are growing up in high-tech worlds. The research suggests 1:1 initiatives provide numerous benefits for student learning; this study focuses on how students manage one of the negative outcomes of anytime, anywhere access: distraction.

Although these benefits help to strengthen students’ self-regulatory skills, laptops can be a hindrance to learning (Corn, 2009; Levine, 2002a), specifically for students who are highly distractible, blind and partially sighted, or highly anxious with low tolerance for frustration (Harris & Smith, 2004). Gay & Hembrooke (2004) established that ubiquitous computing is associated with high levels of temptation and addiction and tends to divert student attention from classroom activities. In one study, students with laptops spend considerable time multitasking and the laptop poses a significant distraction to users and fellow students; laptop use is negatively related to academic success (Fried, 2008). Various methods are employed to help students avoid distraction in high-tech learning environments (Johnson, 2010), including: classroom response systems (clickers) and music (Cole, 2010; Johnson, 2010); setting ground rules at the beginning of the semester for wireless use, including a once-per-class period “no laptop time” (Wireless in the Classroom: Advice for Faculty, 2011); and using monitoring software which involves a range of benefits and drawbacks (Corn, 2009; Robinson, Brown, & Green, 2007). There are a range of techniques teachers may use to help students avoid the distractions caused by laptop initiatives.
Assessment

Laptop initiatives both affect and are affected by assessment methods in the school. There is evidence that students in 1:1 middle school classrooms have statistically significant improvements in English language arts achievement, but not in Mathematics (Shapley, 2008; Silvernail, 2008). Results similar to these have been reported concerning 1:1 initiatives and assessment of English language arts skills (Holcomb, 2009). Rosen (2011), however, investigated the effect of the Time to Know (T2K) program on student achievement and found that T2K students significantly outperform comparison groups. Results like these, along with evidence of improved 21st century skill knowledge (Corn, 2009) and increased student engagement (Bebell, 2005; Great Maine Schools Project, 2004; Lane, 2003; Lowther et al., 2007; Silvernail & Lane, 2004; Warschauer, 2006) lead one to ponder the source of teacher attitudes toward assessment and 1:1 learning.

McGrail (2006) noted that a key concern for teachers was standardized testing's uncertain relationship with technology mandates, lack of agency in planning and implementing the laptop technology initiative, and the amount of time required for professional development. Scholars from Singapore find that students rarely explore new media as alternative sources of legitimate knowledge and miss opportunities to investigate mobile technologies as sites for meaning-making and knowledge construction (Towndrow & Vaish, 2009). Teachers are challenged to design assessment tasks that embrace a wider set of twenty-first century skills (Towndrow & Vaish, 2009) and higher order thinking (Yang & Huang, 2008). After discussing three key components of 1:1 learning, one may ponder whether initiatives such as these will have a place in the future.
There is more evidence that laptop initiatives can improve certain skills. Suhr, Hernandez, Grimes, & Warschauer (2010) investigated the impact of laptops on standardized test scores of upper elementary students, a group that often faces a slowdown of literacy development during the transition from learning to read to reading to learn known as the "fourth-grade slump" (p. 4). The researchers found that after two years' participation in the program, laptop students outperformed non-laptop students on changes in the ELA total score and in the two subtests that correspond most closely to frequent laptop use: writing strategies and literary response and analysis (Suhr et al., 2010). Rosen (2011) investigated the effect of the Time to Know (T2K) program on student achievement. This program includes a structured mathematics and English language arts curriculum of guided learning sequences for elementary schools that included open-ended applets and discovery environments, multimedia presentations, practice exercises, and games along with 1:1 laptops. T2K students significantly outperformed comparison groups on the reading assessment and math reasoning assessment. Evidence such as improved skills and test scores suggests that technology has an effect on learning particular skills.

There is little in the research literature regarding assessment and online distraction. Some scholars have explored the impact of extracurricular activities, such as cheerleading and band, on assessment; Hirsch (2010) found that American students may be more distracted by nonacademic parts of life, such as driving a car at age 16 (younger than other countries) or working a part-time job. Hirsch noted, however, that having these options to explore and realize their inner potential could explain “our nation’s unique capacity to develop leadership, entrepreneurism and imagination in our young” (2010). Research is
limited regarding how much of an impact online distractions have on test scores (Bugeja, 2008); perhaps this study will shed some light on the topic of online distraction and student achievement.

**Self-Regulation Theory and 1:1 Learning**

A discussion of self-regulation leads to a better understanding of distraction avoidance (Heckhausen & Dweck, 1998; Mischel, Shoda, & Peake, 1988). Self-regulation is defined as “how a person exerts control over his or her own responses so as to pursue goals and live up to standards” (Baumeister & Vohs, 2004, p. 500). Human beings develop self-regulation through cognitive strategies that make learning more effective. These strategies can be enhanced through instruction; the goal of self-regulation training is “to enhance learners’ control over their own learning” (Svinicki, 2010, p. 75).

A famous study involving children and marshmallows (Mischel, Ebbesen, & Raskoff Zeiss, 1972) helps to shed light on an important component of self-regulation: willpower. Mischel left children alone in a room with a bell and a promise that if they rang that bell before 20 minutes were up, they would receive one marshmallow; if they waited until 20 minutes had gone by, they could have two marshmallows. Mischel et al. established that participants are able to wait when they distract themselves from the rewards (1972). In a later study, Mischel et al. (1988) found that the same children who delayed gratification longer in preschool (in his 1972 study) were described by their parents as more verbally fluent, able to express ideas well, able to reason, attentive and focused, planners, competent, and able to manage stress better than those children who did not wait for two marshmallows. Metcalfe & Mischel (1999) suggest that willpower consists of a cool, cognitive "know" system and a hot,
emotional "go" system which affects the way humans perceive the world; stress, developmental level, and one’s self-regulatory dynamics determine the balancing act between what’s “hot” and what’s “cool” (Metcalfe & Mischel, 1999). Temporal discounting (viewing rewards as hot or cold) invites one to visualize a long-term reward (e.g., a slim figure) as “hot” to make it outweigh a “cool” short-term reward (e.g., ice cream) (Smoyak, 2009). Students may be experiencing so much distraction in 1:1 initiatives due to tempering certain online activities as hot (i.e. Facebook) and others as cool (in-class assignment). The research will pursue the possibility that it is students’ perceptions of online distractions which leads them to be tempted or not.

Self-regulated learning (SRL) is defined as “the self-directive processes and self-beliefs that enable learners to transform their mental abilities, such as verbal aptitude, into an academic performance skill, such as writing” (Zimmerman, 2008, p. 166). Research during the 1970s is focused on individual self-regulatory processes, such as strategy use or goal setting, and use measures like the Learning and Study Strategies Inventory (LASSI) or Self-Regulated Learning Interview Scale (SRLIS). Zimmerman (2008) examines online measures, such as think-aloud measures in hypermedia environments, observation, and qualitative measures of SRL to explore contextually linked information. Research has shown that a lack of self-regulatory skills could play a role in trainees’ misuse of the increased control they are given due to technology-delivered instruction (Bell & Kozlowski, 2002; DeRouin, Fritzsche, & Salas, 2005; Kraiger & Jerden, 2007). Sitzmann, Bell, Kraiger, & Kanar (2009) found that prompting self-regulation has a positive effect on trainee performance, and relative to the control group, the strength of the effect increases over time. Vohs & Baumeister (2004)
assert that managing attention may be the most effective approach to self-regulation. This study attempts to find out how much of a role self-regulation plays in making effective academic decisions in a 1:1 learning environment.

Jackson (2008) writes, “Amid the glittering promise of our new technologies…we are nurturing a culture of social diffusion, intellectual fragmentation, sensory detachment” (p. 13). The object of one’s focus changes the brain (literally) as well as behavior (Gallagher, 2009). Posner’s theory of attention will be used to guide the researcher’s understanding of humans’ ability to pay attention in learning environments. Posner asserts that the human capacity to process information is selective and limited (Posner, 1982). Posner’s research focuses on the connection between performance, subjective experience, and neural systems. Posner asserts that the orienting network is the flashlight that directs our focus; the alerting network relates to wakefulness; and the executive network is at the heart of controlling attention (and oneself) (Posner & Boies, 1971; Posner & Rothbart, 2007). An emphasis on these three components will help the researcher to consider all of the key components of human attention when analyzing data regarding distraction in a 1:1 learning environment.

**How Students Avoid Distraction in High-Tech Learning Environments**

In *Brain Rules*, John Medina suggests that a key brain rule is that humans do not pay attention to boring things (2008). This rule is evident when observing a student being torn between his or her laptop and focusing on the teacher lecturing at the front of the room. When discussing the myth of multitasking, Medina asserts that interruptions cause humans to take 50% longer to complete a task and make 50% more errors (2008). Now, more than ever, students need to understand how to manage distraction in high-tech learning environments.
More and more machines are present in students’ lives, and they must be vigilant to learn successful uses of new gadgets and platforms (Turkle, 2011). Students report that laptops help them to take control of their own learning (Wooten, 2009) and help them learn 21st century skills, such as life and career skills which include self-direction and social skills (Corn, 2009). Gay & Hembrooke (2004) established that ubiquitous computing is associated with high levels of temptation and addiction and tends to divert student attention from classroom activities.

Further evidence helps to explain the multitasking strategies of students in a 1:1 learning environment. In one study, students with laptops spend considerable time multitasking and the laptop poses a significant distraction to users and fellow students; laptop use is negatively related to academic success (Fried, 2008). Another study surveys two groups of students in a college communication course after hearing the same lecture. The first group is allowed to keep their laptops open and browse the Internet during the lecture, but the second group has to keep their laptops closed. The second group is able to recall more lecture content than the first group. The outcome is not surprising, but as researchers delve into the first group’s test results, they discovered that the key factor in determining how well students remember the lecture content is length of browsing time. A lengthy browsing time “appears to be the nemesis of the multitasker; if one is adroit at staccato-like browsing, processing multiple inputs simultaneously may not suffer to the same extent” (Hembrooke & Gay, 2003, p. 59). By recognizing that components like lengthy browsing time play a role in student distraction and academic performance, teachers may be able to demonstrate how better to manage online distractions.
There is a gap in the literature regarding gender and distractive technologies. Gender differences in male and female computer use have always existed; traditionally, males have had more positive attitudes, higher ability, and used computers more than females (Kay, 1994). Males tend to use computers more than females (Ching, Basham, and Jang, 2005) and tend to interact with the Internet, spreadsheets, presentation software, and games significantly more often than females, but word processing and e-mailing are gender neutral (Finn & Inman, 2004). Kay (2011) found that females reported significantly more note-taking and participation in academic laptop-based activities than males; females were more distracted by their peers' use of laptops than males, whereas males reported that they played significantly more games during class. One study investigating university students' problematic Internet use (PIU) levels found that females had significantly lower PIU levels on all dimensions (i.e., social comfort, loneliness/depression, diminished impulse control and distraction) than those of males (Tekinarslan & Gurer, 2011). This finding is echoed in other literature that suggests males are three times as bad at multitasking than females; researchers note that when multitasking, one’s IQ drops below that of someone who has smoked marijuana (Wilson, 2005). Criss (2009) established that men and women are equally productive when it comes to multitasking, but women are more accurate. Another study assessing pathological use of the Internet (causing academic, work or interpersonal problems, distress, tolerance symptoms, and mood-altering) revealed that pathological users are more likely to be males (Morahan-Martin & Schumacher, 2000). Although gender differences in distraction is not the focus of this study, the researcher remains open to the possibility of different responses from male and female students.
Various methods have been employed to help students avoid distraction in high-tech learning environments (Johnson, 2010). Some instructors find that making use of other technologies, like classroom response systems (clickers) and music, reduced distraction (Cole, 2010; Johnson, 2010). Clickers, for example, force students to pay attention during class rather than browse the Web because they hold students instantly accountable for their knowledge during the lecture (Cole, 2010). By allowing students the option to listen to music while doing individual work, Johnson (2010) discovered that they seem less distracted and stay more on task than students who use technology that involves gaming or chatting with friends. The University of Wisconsin-Madison has provided a useful website to help students and teachers in 1:1 learning environments avoid distraction. The authors emphasize that students remember their role as learner in class, do not continually check e-mail or instant message during class, and do not handle the “business side” of life during class (Wireless in the Classroom: Advice for Students, 2011). The faculty website encourages professors to set ground rules at the beginning of the semester for wireless use, include a once-per-class period “no laptop time,” and establish laptop etiquette (Wireless in the Classroom: Advice for Faculty, 2011). Johnson (2010) suggests dealing with distraction by developing rules for laptop usage in collaboration with students; using technology to enhance traditional teaching (e.g., have students create a video instead of write an expository paper); walking around the classroom periodically to monitor students; and using the technology to restructure the educational process. Teachers may, for example, designate one student as “Google Jockey” to research questions that arise from class discussion (Johnson, 2010, p. 22). The researcher
suspects that teachers in this study will utilize techniques such as using new technologies or music to aid student distraction

**Monitoring Software**

Numerous schools involved in 1:1 initiatives use monitoring software to ensure that students stay focused on the lesson being taught. This will not play a role in the study, because no teachers will use monitoring software. Internet browsing, chatting tools, and online gaming are typically the most prominent activities that students are involved in when off-task (Corn, 2009). Popular types of monitoring software include Eduplatform, E-Chalk, and DyKnow. If a school decides to use monitoring software, the district must ensure that the software is able to handle the volume of laptops required for school-wide implementation (Corn, 2009). While North Carolina teachers note positive aspects of 1:1 learning like student engagement and active learning opportunities, they also acknowledge that negative aspects of 1:1 learning include increased teacher workload and issues related to monitoring and managing classroom behavior (Corn, 2009).

Some issues occur when monitoring software blocks sites that are useful for teaching and learning. In the past, software blocked sites based on particular words; a site could be harmless for studying biology, for instance, but the word “sex” could cause it to be blocked on students’ computers. Barseghian (2011) received some answers that may comfort teachers in an interview with Department of Education’s Director of Education Technology, Karen Cator. Cator clarifies questions regarding the Children’s Internet Protection Act (CIPA). Cator asserts that websites do not have to be blocked for teachers (only students), broad filters are not helpful, schools do not lose E-rate funding by allowing appropriate sites
blocked by filters, and “teachers’ professional judgment should be trusted” (Barseghian, 2011). One highly recommended monitoring software, DyKnow, offers features such as group chat, teacher viewing of each student’s computer, teacher viewing of how students take tests, and freezing every computer to gain students’ attention (Donnalley, 2011). Teachers have commented on DyKnow’s ability to hold students accountable, engage students every day, gain teaching time, and energize the classroom (Donnalley, 2011). Although it is important to understand the impact of monitoring software, the researcher is selecting a school that does not utilize monitoring software.

The Future of 1:1 Learning

After reviewing the benefits and drawbacks of 1:1 learning, one can see that the benefits are too enticing to discount the concept altogether. The customized, engaging, vivid world that high-tech classrooms afford will only continue to enhance teaching and learning.

Educators have learned many lessons through 1:1 computing, including various methods of carrying out student-centered activities (Lowther, Strahl, Zoblotsky, & Huang, 2008), such as authentic learning (Lowther et al., 2007), experiential, hands-on learning activities (Lowther et al., 2008), and project-based learning (Cavanaugh et al., 2007; Lowther et al., 2007; Lowther et al., 2008). They have also learned that students not only get more excited about learning when it involves technology (Lowther et al., 2007), but more creative as well (Corn, 2010). Inventive projects include digital storytelling (Lambert, 2002); multimodal texts to enhance reading comprehension (McKenna, 1998); student election commercials (Curtis, Merry, & Walker, 2011); and improving writing through Google Docs (Pahomov, 2011). It is not just the students who become more excited about learning, but
also the teachers. Rochette (2007) found that once given a SMART Board and laptops, her teaching became re-energized and she began to grasp the possibilities available when one operates with a “Why not?” attitude.

Educators have been made aware of what Dede calls “neomillenial” learning styles (2005). These include: (1) fluency in multiple media and in simulation-based virtual settings (2) communal learning involving diverse, tacit, situated experience, with knowledge distributed across a community and a context as well as within an individual (3) a balance among experiential learning, guided mentoring, and collective reflection (4) expression through non-linear, associational webs of representations; and (5) co-design of learning experiences personalized to individual needs and preferences (2005). Emphasizing these learning styles is especially important for students who easily discard relationships much like they would a video game character or Facebook friend; Jackson (2008) calls this group “the undo generation” because they have always had the option to undo electronic mistakes (p. 59). Alan November suggests that a necessary skill for 21st century students is empathy; this includes global sensitivity developed through social media and tools like Skype (2011). As teachers become sensitive to neomillenial learning styles, they will come to view technology initiatives in a whole new light.

The primary difference the researcher perceives occurring ten years from now is the type of device used in 1:1 learning. Because students are accustomed to information being right at their fingertips, they will become experts at organizing, locating, and understanding that information. The Internet will become an even more user-friendly place that two-year olds can navigate with ease, as children that age have already demonstrated with the iPad
(Anderson et al., 2011). Research has shown that iPads are useful in improving digital literacy skills (Meurant, 2010) and have been used as a less expensive way to move forward with a 1:1 initiative (Steff & Beers, 2011).

The cell phone is another device likely to be observed in classrooms a decade from now, with a different look than the current model (as cell phones today have a much different appearance than a decade ago). Because students are more likely to own a cell phone than have Internet access at home, schools will likely integrate mobile learning even more fully into the classroom (Rogers, 2011b); research has shown that cell phones can be used for blogs, social media, enhancing student motivation, and achievement (Prensky, 2005). Other mobile learning devices gaining popularity include the iPod Touch, iPod, MP3 players, Nintendo DS, Sony PSP, and eReaders (Rogers, 2011a). These devices can make classes more interactive and engaging, and are not as heavy as a laptop, which have led some students to experience back and neck pain (Fraser, 2002), when beginning a laptop initiative (Corn, 2009). Mobile learning devices often surprise educators during implementation. One librarian, for example, found that students loved their Kindle eReaders for the instant access to requested books as well as the level of privacy afforded by the Kindle; teens were able to check out books that they may not have wanted their friends to know they were reading (Barack, 2011).

Finally, 1:1 learning will help people around the world gain access to information that they could never have received otherwise, as nonprofit agencies like One Laptop Per Child realize the power of personal computing, an Internet connection, and an open mind (2011). The world will become a place of even more intelligent people who are provided the 21st
century skills they need to compete in a worldwide economy. One to one learning will indeed help the disadvantaged “become connected to each other, to the world and to a brighter future” (*One Laptop Per Child*, 2011).

This section has provided a review of literature related to this study, including the benefits and drawbacks of 1:1 learning; ways in which technology affects pedagogy and assessment, particularly in English language arts classrooms; self-regulation theory, attention theory, and their effects on 1:1 learning; and the future of 1:1 learning. The researcher has succinctly explored the literature affecting the study to provide the reader with a working knowledge that will be useful in understanding the methods of data collection and analysis described in Chapter 3.
CHAPTER 3: RESEARCH QUESTION AND METHODOLOGY

The purpose of this study is to discover strategies that students and teachers use to help students avoid distraction in a 1:1 setting. This chapter provides a description of the research question and methodology for this study. Because 1:1 learning has such an impact on student distraction, the primary research question under investigation is: How do students and teachers manage distraction in a 1:1 environment?

Sub questions include:
1a. How do English IV students manage distraction when working with technology?
1b. How do English IV teachers help students manage distraction when working with technology?
1c. How do these experiences differ based on achievement level (honors vs. non-honors)?

Research Design

The aim of this study is to discover ways in which teachers and students manage distraction. Due to the nature of the research question, a qualitative orientation to the project is preferable over quantitative research and its reliance upon predetermined evaluation instruments. Research designs of studies in school settings are often guided by the qualitative research tradition, which allows the researcher to “enter and spend considerable time in schools…learning about educational concerns…the data are collected on the premises and supplemented by the understanding that is gained by being on location” (Bogdan & Biklen, 2003, p. 4). The researcher chose the sample school because she could make multiple visits to gain a clear picture of the school culture. The researcher chose a qualitative approach for these reasons and for the fact that studies utilizing quantitative methodologies have established that distraction is an issue in 1:1 learning environments (Fried, 2008; Grace-Martin, & Gay, 2001; Hembrooke & Gay, 2003). A researcher might consider a case study...
approach if he or she has clearly identifiable cases and seeks to provide an in-depth understanding of the cases (Creswell, 2007). One may also wish to compare several cases, such as two classrooms that are experiencing the same program; this study compares multiple classrooms, teachers, and students experiencing a 1:1 initiative. This allows the researcher to thoroughly explore the clearly identifiable cases which include both AP/honors and traditional classes. Researchers have numerous possibilities for purposeful sampling; they may wish to select cases that are “oddballs” or use ordinary cases; in this study, there is a mixture of traditional classes and honors classes. Case studies are often used for explanatory questions that begin with “how” and “why” (Yin, 2003, p. 6); the study seeks to answer the question, “How do students and teachers manage distraction in a 1:1 environment?” This question will be answered through qualitative methods, including interviews and classroom observations completed on location in the school environment (see Figure 3.1).
Qualitative Data Collection \rightarrow Qualitative Data Analysis \rightarrow Interpretation

**Procedures:**
- One-on-one semi structured interviews will answer RQ 1a and RQ 1b
- Classroom observations using LoFTI will answer RQ 1c

**Products:**
- Transcripts
- LoFTI Data
- Journal

**Procedures:**
- Coding
- Thematic development

**Products:**
- Coded text
- Themes

**Procedures:**
- Summarize dimensions

**Products:**
- Description of dimensions
- Application of Themes

RQ: How do students and teachers manage distraction in a 1:1 environment?
1a. How do English IV students manage distraction when working with technology?
1b. How do English IV teachers help students manage distraction when working with technology?
1c. How do these experiences differ

*Figure 3.1. Diagram of Design.*
The researcher must put forth a great deal of effort selecting the case amongst several that might be possible candidates (Creswell, 2007). The sample school was selected because they are the recipients of a highly refutable technology grant which provided laptops for each classroom. The researcher is choosing no more than three to four classes in which to collect observation and interview data because “the more cases an individual studies, the less the depth in any single case” (Creswell, 2007, p. 76). Yin (2003) criticized those who argue against generalizing from a single case; she asserts that case studies are “generalizable to theoretical propositions and not to populations or universes” (p. 10). The researcher used the data to generalize to theoretical propositions, such as the strategies students and teachers use to manage distraction in a high-tech learning environment.

**External Factors**

Bussey and Bandura (1999) discuss the agentic sociocognitive view in which “people are self-organizing, proactive, self-reflective, and self-regulating, and not just reactive organisms shaped and shepherded by external events” (p. 691). This view suggests that controlling one’s thoughts and actions is a mechanism of personal agency. In a 1:1 learning environment, however, one must consider that external factors such as instructor strategies or monitoring software may play a role in preventing student distraction. The study seeks to discover the role that instructor strategies play in managing student distraction. Gay & Hembrooke (2004) suggest that the distraction that occurs due to ubiquitous computing could be decreased by shared frameworks, resources, and objectives in collaborative learning environments. Two of their recommendations include understanding new social protocols
and norms for computer mediated communication environments as well as how researchers and designers can provide structure and guidance for participants (Gay & Hembrooke, 2004).

**Participants**

High school students and teachers from one western North Carolina school currently involved in a 1:1 initiative make up the sample. This school is a recipient of the IMPACT grant, which provides schools with a model for technology integration, with components such as: having a full-time technology facilitator and media coordinator in place; developing a school-wide focus on flexible access to computer labs, mobile computer carts, and libraries; a 1:1 setting in some cases; and collaborative planning (Mollette et al., 2011). The overall goal of the IMPACT model focuses on integrating technology into teaching and learning in North Carolina K-12 schools, with hopes that the model makes a significant difference in student achievement, improves teaching practices, and better prepares students for work and life in the 21st century (Mollette et al., 2011). The research site distributed Dell-mini laptops in the spring of 2010 to teachers and to students in the fall of 2010. Students are allowed to take laptops home; however, the in-school filters also apply to the laptops when used at home. The school has a full-time technology facilitator along with a full-time technician who are available throughout the day to help students with laptop issues. Teachers were provided with professional development funding so they could learn more about how to implement the technology. A technology team helped the teachers prepare for the new style of teaching that stems from laptop initiatives.

Further, because the chosen school does not use school-based monitoring software, the researcher was able to get a true sense of participants’ strategies for managing distraction.
Interview data was collected from a sample of sixteen high school students and three high school teachers at one North Carolina high school currently implementing a 1:1 initiative. Nineteen total interviews (sixteen students, three teachers) and six classroom observations were conducted for this study. NC School Report Card data from the 2009-2010 school year reveals that there are less than 1,000 students and less than 100 teachers at the research site (2011). One hundred percent of classrooms are connected to the Internet, and due the IMPACT grant, every student has a laptop. Each teacher has professional development opportunities to enhance their knowledge about teaching with technology (Mollette et al., 2011).

Participants were identified using the maximum variation sampling strategy to ensure that findings reflect different perspectives (Creswell, 2007). Maximum variation sampling strategy was chosen due to this study’s small sample size (three teachers and 16 students), along with the need to maximize the diversity relevant to the research question (Creswell, 2007). Teachers selected students for the interview based on two conditions: positive distraction management (staying focused during lectures, remaining on task, appearing engaged in the lesson) or negative distraction management (rarely staying focused during lectures, getting off task easily, and not appearing engaged in the lesson). The researcher provided specific criteria to teachers for student selection, which involved how successfully the student maintains attention on an appropriate task, regardless of input modality (visual, auditory) or type of task (Posner, 1986), and how successfully the student manages cognitive interference (Fried, 2008).
Criteria for teacher selection include being an English language arts teacher of twelfth grade students in the sample high school who was willing to be interviewed and observed. The researcher sought a classroom sample in which group-based, self-directed, and teacher-led activities were taking place. Teachers were made aware of this through an e-mail notification and agreed to conduct these types of lessons on the days the researcher was present to conduct classroom observations.

Participants were chosen from AP/honors and traditional English language arts classes for numerous reasons, such as the student’s need to utilize different texts for different purposes; online versus printed reading preferences; the required nature of the course for all students; and the option to investigate AP/honors and traditional students. Along with learning New Literacies and video technology, English teachers are discovering that the tools and resources available through the Internet lend themselves to the subject of English language arts. Students have to locate, respond to, and evaluate information in a much more active way than they have historically done. Because English teachers have traditionally discussed language and the way texts influence each other, they may find it easier to implement technology-based activities than a teacher in a math classroom. Math teachers, for example, may prefer to have students write answers out by hand rather than use the laptop for activities; they also tend to prefer using content-specific software along with the laptop computer, such as Geometer’s Sketchpad (Corn, Osborne, & Halstead, 2008). Suhr et al. (2010) noted that using laptops in the English language arts classroom often results in improved writing skills and reading comprehension. The copious amount of online reading of which students partake also played a role in the selection of English students for this
study. Coiro and Dobler (2007) discovered that reading online includes similar components one would use when reading printed texts, such as prior knowledge sources and inferential reading strategies. A third element, self-regulated reading processes, could help explain how reading online could require more complex skills (Coiro & Dobler, 2007). As leaders navigate appropriate amounts of agency teachers should have in planning, English language arts practices in 1:1 learning environments warrant further study as teachers adapt to new meanings of literacy and language (Jarzab, 2003).

The researcher remained aware of issues such as the benefits of research to the participants over risk, deception or covert activities, and protecting the anonymity of the informants (Creswell, 2007). The researcher was particularly attuned to the emergent design that is a key part of qualitative research; this means that the phases of the process may shift after data collection begins (Creswell, 2007).

**Data Sources and Instruments**

The study was conducted in three phases. Phase I and III consist of classroom observations, and Phase II consists of interviews (see Table 3.1). Each teacher was observed teaching twice, and student participants were interviewed once. Teachers were interviewed twice: once before observations and once afterward. The second teacher interview served as a debriefing session to ensure member checking of the researcher’s interpretations (Miles & Huberman, 1994).
Table 3.1

*Summary of data sources and instruments.*

<table>
<thead>
<tr>
<th>Phase</th>
<th>Instrument</th>
<th>Data Collected</th>
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<tr>
<td>I</td>
<td>LoFTI</td>
<td>Classroom Observations</td>
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<tr>
<td>II</td>
<td>Teacher Interview Protocol</td>
<td>Teacher Interviews</td>
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<td></td>
<td>Student Interview Protocol</td>
<td>Student Interviews</td>
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<td>Teacher Debriefing Interviews</td>
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<tr>
<td>III</td>
<td>LoFTI</td>
<td>Classroom Observations</td>
</tr>
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In Phase II of the study, the researcher used a semi-structured interview schedule featuring open-ended questions (see protocol below) to gather comparable data across participants (Bogdan & Biklen, 2007; Fontana & Frey, 2000). All interviews were audio taped and transcribed for data analysis. Teachers and students were approached during a face-to-face interview with the researcher. The researcher explained the scope of the study and asked permission to include the participants in the study. If participants agreed, they were given a hard-copy of the informed consent form and asked to sign the form if they wished to participate.

**Procedures**

The researcher observed different types of class activities throughout the study, focusing on three specific types: group-based, self-directed, and teacher-led. These sessions lasted for 30 minutes and focused on two key components: how teachers manage technology-
related distraction while they provide instruction and how students manage technology-related distraction while they learn. By selecting multiple styles of classroom activity, the researcher can begin to decipher the relationship between laptop use and distraction (Fried, 2008). Because certain lessons have a more distractive nature than others, the researcher seeks to observe two types of lessons from each teacher. This way, one may gauge distraction management in light of two different activity models.

The researcher conducted interviews with 16 students and three teachers. Following the last round of classroom observations, the researcher debriefed with each teacher to ensure the trustworthiness of her interpretations. Both forms of data were discussed using code numbers for the students and code letters for the teachers. The observational data from the classroom visits is not identified by student or teacher name. Participants were assigned a random letter to allow the researcher to differentiate between the participants. The master key for the code is kept in an online, password-protected folder to which only the principle investigator has access. Efforts were taken to ensure anonymity to the level possible.

Incentives for teacher participation include one $25 Amazon gift card per teacher. Incentives for students include entrance into a drawing with a chance to win a $25 gift card. Winners included one student and every teacher who participated in the study by agreeing to be interviewed. Students had to complete one interview to win, and teachers had to complete both the first interview and the debriefing interview.

**Phase I & III – Classroom Observations**

In the first and third phase, the researcher observed classrooms to get an overall perspective of students’ ability to focus during class. Using an updated version of the LoFTI
(Looking for Technology Integration) observation instrument, the researcher was able to record not only issues of distraction, but also classroom demographics, teacher activities, technology uses, levels of student engagement, and the classroom agenda. The updated version includes a component which allows the researcher to document how students and teachers are using the technology (either for learning or non-class purposes) for ten consecutive three-minute periods during class, thus providing a more accurate picture of laptop use (Sovern, 2011). The researcher also maintained copious notes regarding the types of activities in which students may be more likely to give in to technology-based distraction. To control for reflexivity, the researcher maintained a journal that contains field notes, thoughts, uncertainties, values, and assumptions as they arose throughout the research process (Carlson, 2010). Classroom observations help to triangulate the data and allow the researcher to successfully report students’ and teachers’ strategies for managing classroom distraction.
The LoFTI instrument (see Figure 3.2) was developed by SEIR*TEC at SERVE in collaboration with the North Carolina Department of Public Instruction Educational Technology Division to collect observation data about a variety of broad areas of technology implementation and impact (Looking for Technology Integration, 2010).

**Figure 3.2.** Observation Protocol.

**Phase II - Interviews**

The researcher conducted the interviews in the fall of 2011. Interviews were approximately 30 minutes in length and were audio-recorded. The researcher also took handwritten notes during the interview. The interviews were conducted in a typical classroom setting. During the interview, participants were asked their opinions as to how they manage distraction in a 1:1 environment. They will be asked the following interview questions:
Interview Protocol for Students
Date/Time/Location:

Measuring Distraction Level
1. How often do you focus on just one task when you use the laptop in class? (e.g., Do you go directly to the site you need to visit?)
2. Does the Internet tempt you to do something non-instructional during class, like check personal e-mail or social networking sites? Explain.
3. When using computers in class, do you ever minimize windows quickly or try to hide what you are doing when the teacher walks by?
4. Do you focus better when reading online or when reading printed text like a book or magazine? Why?

Strategies for Managing Distraction
5. How do you deal with online distractions at school?
6. What is your process for completing an assignment on your laptop? For example, once you are sitting at your computer, do you use any special techniques to stay focused?
7. Does learning to avoid online distractions at school affect how well you avoid distractions outside of school? Explain.
8. Would you say that using the laptop has helped you learn to deal with distraction? Explain.

Interview Protocol for Teachers
Date/Time/Location:

Measuring Distraction Level
1. How often do your students focus on just one task when they use the laptop in class? (e.g., Do they go directly to the site they need to visit?)
2. Does the Internet tempt students to do something non-instructional during class, like check personal e-mail or social networking sites? Explain.
3. When using computers in class, do students ever minimize windows quickly or try to hide what they are doing when you walk by?
4. Do students focus better when reading online or when reading printed text like a book or magazine? Why?

Strategies for Managing Distraction
5. How do you help students deal with online distractions at school?
6. What process do students use to complete assignments on their laptops? For example, once they are sitting at the computer, do they use any special techniques to stay focused?
7. Does learning to avoid online distractions at school affect how well your students avoid distractions outside of school? Explain.
8. Would you say that using the laptops has helped your students learn to deal with distraction? Explain.
Data Analysis Procedures

Interviews were analyzed using thematic content analysis (Corbin & Strauss, 2008) to answer the research question along with the sub questions. After gathering and organizing the data, it is important for the researcher to gain a sense of the whole database. The researcher sought to review the database to first identify major organizing ideas and “hear” what participants are saying (Creswell, 2007, p. 151). After reflecting on the larger thoughts, initial codes were formed, particularly in light of evidence that included multiple perspectives regarding each category (Stake, 1995). The researcher began with a short list of tentative codes that matched text segments (Creswell, 2007). Next, the researcher organized strategy codes, comprised of methods used to accomplish a goal, into categories (Bogdan & Biklen, 2007). The researcher then utilized the statements that best illustrate these categories to understand how each participant avoids (or helps others to avoid) distraction in a 1:1 learning environment (Hesse-Biber, 2010). The researcher developed codes until the point of saturation is reached (Denzin & Lincoln, 2000). The researcher was sure to intertwine the collection and analysis process through continual documentation of observer comments, writing memos to aid self-reflection, and considering metaphors and analogies (Merriam, 1998). A constructivist-interpretive paradigm, along with the framework for 21st century learning and Posner’s theory of attention, served as the lens of analysis (Denzin & Lincoln, 2000; Partnership for 21st Century Skills [P21], 2003; Posner, 1982).

Trustworthiness

An understanding of validity and reliability in qualitative research leads the researcher to use the term “trustworthiness” to describe measures of the study’s credibility
(Lincoln & Guba, 1985). To ensure that the study is trustworthy, the researcher used multiple data sources (semi-structured interview transcripts, field notes, LoFTI results) to triangulate the data (Merriam, 1998). Further, a debriefing occurred with each teacher to ensure member checking of the researcher’s interpretations (Miles & Huberman, 1994). This study follows the multiple-case study design, a commonly used method for “a study of school innovations...in which individual schools [or classrooms within a school] adopt some innovation” (Yin, 2003, p. 46).

**Ethical and Political Considerations**

There are several steps the researcher has taken to achieve trustworthiness, validity, and reliability. Merriam (1998) asks the researcher to consider one’s own assumptions prior to the study. The researcher has ensured trustworthiness by keeping her own assumptions in check, and by writing notes in her journal before and after the interviews. Carlson (2010) has suggested that to control for reflexivity, a journal should be kept that contains the researcher’s field notes, thoughts, uncertainties, values, and assumptions as they arise throughout the research process. I ensure trustworthiness by following the interview protocol to be sure to ask all students and instructors the same questions. Preliminary visits to the school sites helped me develop early familiarity with the culture of the participating institution, before I began the actual data collection and interview process. Member checks along with multiple forms of data, including interviews and classroom observations, increase trustworthiness.

The researcher gained Institutional Review Board (IRB) approval before conducting the study since human subjects were used in her research. She was aware that the planned
phases of the process could shift after entering the field and beginning data collection (Creswell, 2007). The researcher stayed aware of any revisions that needed to be made for interview questions, but maintained the same research questions to stay within the boundaries of the IRB.

For the potential study, there were a few possible ethical issues and risks to participants. Upon corresponding with a technology facilitator (TF) at each school, a handout was disbursed explaining the study to teachers. After obtaining teacher e-mail addresses from the TF, the researcher asked teachers to choose four students from their classes to be interviewed (two who struggle with distraction in class due to the laptop and two who do not struggle with distraction in class due to the laptop). Teachers selected students based on how successfully the student maintains attention on appropriate task, regardless of input modality (visual, auditory) or type of task (Posner, 1986) and whether the student successfully manages cognitive interference (Fried, 2008).

The researcher was able to collect a range of perspectives that adequately acknowledge the axiological assumption of the role of biases and values in the study. The researcher remained aware that the intent of qualitative research is not to generalize information, but “to elucidate the particular, the specific” (Creswell, 2007, p. 126). The researcher acknowledges the limitation that one class to the next in the sample can change, but was intentional about including classrooms exhibiting a range of group-based, self-directed, and teacher-led activities.
Positionality

The researcher’s experience as a research assistant led her to the study of distraction in 1:1 learning environments. Because she helped evaluate the North Carolina laptop initiative, the researcher is able to fully grasp the difficulties involved with sustaining student attention and engagement in the classroom. She brings many biases to the study, including the belief that more technology is not always better for a school district. There are many troubles that can never be solved by investing more money or technology into them. The researcher does, however, believe in the power of advanced technology to make learning fun for all students. She remained aware of these biases throughout the research process. The researcher’s relationship with those in the study is a professional one between researcher and those being researched. On a personal level, the researcher is from North Carolina and was a student in the public school system. The researcher sought to hear the voices of these students who have discovered ways to conquer distraction in a technology-filled learning environment and learn how they have harnessed the power of that technology to become the best they can be.

Limitations

Because qualitative research is not value neutral, it can be difficult for the researcher to separate personal bias opinions from the data (Creswell, 2007; Merriam, 1998). Qualitative researchers are challenged to balance personal perspective and interpretation of the data (Bogdan & Biklen, 2003; Maxwell, 2005). The researcher utilized various methods to balance subjectivity. As the primary instrument of data collection, the researcher maintained a constant awareness of her own perceptions and beliefs throughout the research
study (Merriam, 1998). One must also be aware that the data is self-reported and there is no comparison group. Limitations also include a lack of generalizability due to all participants being from North Carolina high schools.

More research is needed to understand how students avoid distraction in high-tech learning environments and whether monitoring software should be used (Corn, 2009). More research is necessary because laptops have been shown to distract students during class, but some would argue that their positive effects outweigh the negative outcomes (Fried, 2008). Further research is needed to discover methods of dealing with distraction caused by laptops (Levine, 2002). This study will contribute to a deeper understanding of the distractive nature of laptops in the classroom. Through qualitative data collection and analysis, this study will expand the field of instructional technology and potentially increase the effectiveness of teachers and students so they may excel in school. By employing the techniques that teachers and students say work best for avoiding distractions, teachers can hypothetically prepare students for a lifetime of uninterrupted learning.
CHAPTER 4: RESEARCH FINDINGS

Data analysis and coding processes are described in Chapter Three. This chapter presents the qualitative results of the study to answer the primary research question: How do students and teachers manage distraction in a 1:1 environment? The chapter is divided into four sections; the first section will answer research sub question 1a: How do English IV students manage distraction when working with technology? The second section will answer research sub question 1b: How do English IV teachers manage distraction when working with technology? The third section will answer research sub question 1c: How do these experiences differ based on achievement level (honors vs. non-honors)? The final section will summarize the findings that arose across all questions.

Students and Distraction Management

At the sample school, all students and teachers are provided with a laptop and a wireless Internet connection. The Internet has school-wide filters which block sites that are likely to distract students during the day, such as Facebook or Twitter. Students do, however, find workarounds such as proxy servers, which allow them to “break past” the filters by permitting students to access off-limits online material. School administration has access to every site students visit on their laptops, so if someone is on an inappropriate site on a Saturday evening at home, they could face punishment upon their return to school. Students generally agree that the filters are a positive necessity for their learning needs; very few believe administration should unblock the sites that would distract them from their work. Findings from AP/honors and traditional student interviews have been compiled thematically in the following section.
How Teachers Impact Student Distraction

Students commented mostly on the way filters help them to avoid distraction in class. They also mention some teacher behaviors that guide their distraction avoidance. One student appreciates her teacher’s approach to the laptop: “He has us do what he wants us to do and then it’s “Shut your laptops” and he makes us shut them.” This method helps to keep her attention focused on the lesson rather than on electronic distractions. The way in which teachers use the technology is a key factor; one honors student notes, “We don’t use them every day, every second of the block. They just allow us to use them whenever we need.” Students comment on the sheer lack of opportunity to get distracted due to their rigorous coursework. Both traditional and AP/honors students focus on which course of action will guide them toward completing their goals. One student remarks, “Culinary [class] won’t let me graduate; English [class] will.”

Another key method that teachers use is to set strict deadlines for assignments so that they have to be completed before the class period is over. This leaves little time for succumbing to online temptations: “I just remember [that] I only have a time period to complete what he’s telling me to complete, so I better go ahead and get it done instead of playing around.” Teachers enjoy using the Angel course management system, which allows them to post syllabi, grades, and assignments. Similar to course management systems like Moodle and Blackboard, Angel provides a discussion board which is used frequently in the sample. Because teachers make use of the Angel platform for assignment submission, students know that when a drop box closes, it is closed for good, and there are no excuses for missing assignments.
Students note that other than accessing other assignments, they may seek another task if they are bored with the current one. They also distinguish between which assignments are important and which are presented to simply pass the time; students call these assignments “busy work.” One honors student notes, “If it’s an important kind of thing that we’re doing on the laptop, I focus only on that. But if it’s something like classwork that doesn’t really have to be due or isn’t for a grade then I won’t really concentrate on it.” A traditional student echoes this sentiment: “I get distracted easily but I know when it’s the time to do work or not, so I try to stay focused as much as I can when I know it’s something important.” Another traditional student notes,

If I have an assignment and I know that it’s going to be engaging and entertaining to me, whether it’s on the computer or not, I’ll pay more attention to it, but if I feel like, OK, whatever, I’ll just do it, check Facebook, check Twitter, do it, tweet, check Facebook, check twitter, do what I need to do, update a status…basically I’m not focused because it’s not very intriguing.

Students may procrastinate more with easy assignments. One honors student notes: “If I know the task is more difficult I try to focus more on that, but if it’s an easy assignment, I’ll just take a little time off and then do it; I’m guilty of that.”

This idea of making the assignment seem important to the students is essential for teachers to grasp. An honors student finds her mind seeking other tasks when the teacher lectures for a long time: “If the teacher’s just talking and it’s something that I already know or isn’t something that I’m interested in, it gives me a reason to look at other stuff, go on Google, search up something, work on other work.” This student’s quote illustrates a typical
sentiment of 21st century students: they prefer classes that minimize the traditional lecture and make use of the numerous technology innovations that available, such as using VoiceThread to record lectures (Barnhill, 2009; Pecansky-Brock, 2011). A traditional student completes assignments based on their importance for graduating: “Some things we have in class are worth less than other things, so [for] the things I know she’s going to [grade for participation], I’ll just give a little effort.” When students do not see the connection between the assignment and their final course grade, they are more likely to seek out or fall prey to distractions. The interview data suggest that when teachers set firm boundaries, students are better able to manage online distractions.

**How Students Deal with Distractions**

When asked how they deal with online distractions, students tend to either rely on internal personal strategies, such as self-regulatory techniques, or external pressures, such as graduation. Students discuss internal strategies: “I have to force myself and have learned that you’ve got to get your work done now and it’s just something that you’ve got to do within yourself. Like, say, OK, ‘You’ve got to get your work done’ so go ahead and stay focused.” Students in other 1:1 initiatives have accentuated the self-discipline necessary to avoid online distractions (Mathiasen, 2004).

One traditional student may stray from one assignment if something about another one dawns on her in a moment of inspiration: “If I’m on my laptop and I think about English, ‘Oh I have a paper due for such and such,’’ I’ll start typing it.” Students admit to sometimes playing games or listening to music when they are supposed to be working; one student happily remarks that one teacher allows her to play games once she has completed her
assignment. Other students might be drawn to sports websites; two male students note that they often drift away from class assignments to check their favorite athlete’s record or get an update on their favorite soccer team. Students might intersperse working on their assignments with checking school e-mail or reading online books. One honors student describes herself as feeling lost when she begins researching online: “I’ll get distracted on one site trying to research something, and sometimes I think of something else I have to do and switch over to that. Sometimes I get lost.” This is what Carr refers to as a generation of “hunters and gatherers in the electronic data forest” (Carr, 2010).

**Internal Strategies**

When asked about the processes for completing assignments on their laptops, students provide a range of responses. Some note that music can help them to avoid distraction, while others prefer complete silence (more females than males). Male students enjoy listening to music to block out distractions, but female students generally prefer for it to be quiet. One traditional student’s process for completing assignments first involves visiting Angel, the school’s course management system, to check his grades; this provides a clear view of what is expected of him and what he needs to do. AP/honors students have detailed techniques they use for completing assignments. One AP/honors student tries to zone everyone else out and “get completely focused on what I’m doing and make sure I’m only thinking about that one thing.” Another student from the same class takes advantage of the color options available on the laptop: “I’ll put one section in red, one in yellow; I utilize the highlighter… so it kind of catches my attention.” Another AP/honors student uses the technology for brainstorming and planning: “No matter what the assignment is I usually open a Word
document first and just start typing down some random stuff that I think will be needed for
the assignment.” Next, this student selects music before “putting it all together, and
depending on the music is how fast I work.” Another AP/honors student likes to have the
Internet open in one window and her assignment open in one window (a method also
mentioned by traditional students); this student limits her academic work to the school laptop
when completing work at home because she does not want to be tempted by the sites which
are accessible on her home computer. A traditional student likes to use her dining room table
at home to best complete assignments: “I’ll break it up into stations; I’ll turn the chair this
way and do it over there, then I’ll go to one side of the table…It’s almost like I am in my
own zone, like I have my own little factory.” This student brings her laptop to each “station”
and completes assignments systematically. By attributing a certain physical space to each
assignment, this student improves her chance of completing each assignment before getting
carried away with another one.

External Pressures

Data suggest that external pressures help students manage distraction. They consider
options and choose the one that best matches their long-term goals: “I just think, ‘Which one
would be better for me?’” In a similar vein, another student remarks, “I kind of weigh which
one needs to be done first … and if the other thing needs to be done first I’ll go do that and
come back to it later but if the task I’m working on needs to be done first then I’ll just keep
doing that.” Students tend to take the approach of “Now or never.” They complete the
assignment because they know that they can “play” later. One AP/honors student notes,
“Every time he tells us to get on the computers it’s kind of just what I do. I don’t, like, stray
around until I finish everything.” Another AP/honor s student remarks, “I only turn it on when we are instructed to do work-specific tasks, so…I usually just get on there, do what I need to do, and be done with it.” Many students agree that they would probably be on other sites when they are supposed to be doing class work if it were not for the school-wide filters.

Seniors in particular are acutely aware of the need to complete all assignments in order to qualify for graduation. Students note that during their sophomore year they were more likely to seek distractions rather than complete course work. Because they have made it this far, they feel a responsibility to get things done so they may accomplish their goals. One traditional student notes, “With my senior year, I changed a whole lot, with my attitude in school, with getting my work done…being a senior and me wanting to graduate and get out of high school has pushed me.” Students feel the urgency with each assignment as they move closer to graduation day.

Most students do not attempt to bypass the blocked content and would rather use their school time for academic purposes. Students also comment on their ability to multitask during class. One AP/honors student who is a self-proclaimed “techie” remarks, “I’m pretty good at multitasking, so even though I might be doing something on my laptop I can still listen to everything my teacher’s saying.” Another student agrees: “I’m almost always on my laptop messing around, whether it’s another class’s work or I’m just looking up some random stuff, but I still pay attention well enough to do all the work.” Many students ask the teacher if there is anything else to work on for the day, and if the teacher says no, they will play a game. Students believe that having the leeway to listen to music or play games once they are finished with assignments helps them behave better.
One honors student finds it helpful to get out of his seat a few times to “give myself a little rest and then go back to doing my work.” He finds that this method of focusing works much better than just sitting “in front of the computer screen trying to get all your work done.” Taking a physical break is a great way to increase productivity (Zijlstra, Roe, Leonora, & Krediet, 1999), and taking mental breaks is also important. This student is certainly on to something, as Coker illustrated in his study, which notes that workplace Internet leisure browsing (WILB) increases productivity, enables restoration of mental capacity, and fosters feelings of autonomy (2011). A traditional student echoes a similar sentiment, noting that she likes to take breaks from her assignment to chat online. Just as Coker’s study illustrates that workers who take mental breaks during the day perform much better than those who do not take breaks, teachers must recognize that students have similar needs in the classroom.

When asked how often they focus on just one task when using the laptop in class, half of the students agree that they stay focused even when they have multiple windows open. Of the 16 interviews, four traditional students and four AP/honors students focus on solely one task when they use their laptops in class. Students often go outside the bounds of an assignment for assistance or explanations; for example, they may use a Web browser to access an online dictionary, or Wikipedia for a more thorough illustration. Some students believe that the anticipation they feel regarding graduation urges them toward focusing on and completing one task. One honors student focuses best when he is “working on one specific assignment to get that done rather than having all the assignments I would need to do up.”
How Laptops Help Students Avoid Distractions

Some students believe the laptops help them to avoid distractions, while others believe the laptops themselves cause a great deal of distraction. One student feels pleased with himself when he avoids chatting with friends and gets his assignment done instead. Because students focus mostly on class work while in school, they often transfer this same mindset to homework: “When you get on a computer [on which] you can do whatever-like you can be signed into Facebook while you’re doing homework-you’re less likely to do that because you’re in the habit of not doing it.” One student who found it difficult to ignore online distractions during class notes that low grades were a sign for him to begin focusing on what is important: “With the kind of school work I have to go through now, I’ve learned to put off those distractions…recently in this class I was doing really bad, but I managed to bring my grade up 20 points the last six weeks because I learned to put the distractions to the side during school.” This illustrates how learning to deal with online distractions can directly impact academic success.

One way in which the laptop helps students avoid distractions is through listening to music. Students note that music helps them to drown out other distractions and focus on the assignment at hand. One traditional student notes, “With music in my ear I can keep working longer.” He finds that music keeps him on task and helps him to persevere through a challenging or time-intensive assignment. Students also believe that having the option to listen to music while taking a test is quite helpful and even improves their test scores. One student uses music to distract herself, even when the teacher does not allow it: “I know it’s wrong, but I stick head phones in. I have to…trying to tune something else will make me
focus on what I need to do.” After hearing that music was a key piece of distraction avoidance, the researcher began probing about the type of music students listen to. The types of music include all genres from jazz to student-produced rap music. Perhaps students use music as a cognitive distraction from other distractions, as it orients their attention away from online distractions, much like evidence found in medical research which reveals music’s ability to reduce pain (Silvestrini, Piguet, Cedrashi, & Zentner, 2011). Some students would prefer to take tests while listening to music; one traditional student even created a petition for students to be able to listen to music while taking the seventh and tenth grade writing tests. She describes why music would help her during tests: “I think…if you try to tone out something else, you can focus on [your work] better…but if you don’t have anything to tone out, then you’re not going to really focus on what you have.” It is interesting to note that students use technological tools such as music players and the course management system available on the laptop to help themselves manage online distractions.

**Online Temptations and the Need to Monitor**

When asked if the Internet tempts them to do something non-instructional during class like check personal e-mail or social networking sites, 81% (thirteen of sixteen) of the students interviewed respond affirmatively. Seven traditional students and six honors students agree that the Internet tempts them to do non-instructional activities during class. When asked if they ever minimize windows quickly or try to hide what they are doing when the teacher walks by, half of the students interviewed respond affirmatively. Six AP/honors students and two traditional students admit to feeling the need to minimize windows when the teacher walks by, even if the site they are attempting to hide is for academic purposes.
rather than entertainment. Of those who do try to hide windows, it is usually because the content of those windows consists of games, music, or an assignment for another class. Students also enjoy web sites that inform them about personal interests such as shopping or sports. Students especially like pursuing these activities after they complete work, treating them like rewards. One traditional student notes, “If we’re doing book work and I’m already done with it, I’ll get on the computer and [play a] game, like PacMan Google.”

Students also note that because they are seniors, they often feel the need to check their personal e-mail for college acceptance/rejection letters and scholarships. One honors student asks the researcher about her experience at N.C. State and has college on his mind; he discusses how this is distracting in itself: “I check to see if colleges have sent me something... because you’ll forget about a scholarship or something and you want to go check it.”

One honors student finds himself trying to think of other web sites to view when he needs a mental break since he cannot access his favorite ones due to filters: “Everything is blocked, so now you’ve got to find something else to look at.” Because teachers utilize the Angel course management system, students may use this platform to view assignments for other classes while completing course work in class. One honors student notes, “All our work is on a system [Angel], so it just lets me do other work.”

One AP/honors student notes that he may appear to be “just randomly flopping around the Internet,” but is actually seeking other sources to help with his assignment. Students who do not try to hide what they are doing or minimize windows when the teacher walks by tend to avoid this behavior because the school wide filter prevents them from
accessing their favorite personal websites. One AP/honors student remarks, “You might be searching something on Google and for some reason something crazy pops up you try to quickly x out of it and hope you don’t get in trouble for it.” A traditional student opens up about attempting to hide content from teachers; when asked if he ever tries to hide content, he says, “Are you reading my mind? It happens all the time, when the teacher walks by. You don’t want them to know that you’re on other stuff, so…I’ll just click the little minimize button or exit out completely and go back to it when they’re gone.” Students note that they may have been more likely to try to hide online activities from the teacher during lower grades more frequently that during their senior year. The anticipation of graduation pushes students to complete work in class.

Many students do not feel tempted by the Internet simply because the filtered content prevents them from having to worry about online temptations. One traditional student notes that having filters helps him to stay focused because “someone is watching you” during every online moment. They admit that they would be more tempted by personal websites if the blocks were removed. Most students do not seek external sources for entertainment; rather, they are likely to stray from the assignment if they have a thought about another school assignment and would like to write it down before they forget it. Students who want to monitor their personal e-mail or social networking sites tend to use their phone during the day to check this. This suggests that some students are not managing distraction well because they simply use one tool (their cell phones) to get around the online filters on the laptop. One student would appreciate the ability to check these sites on her laptop rather than her phone because it would not be so obvious during class: “I…try to check my phone sometimes for
my Facebook or my Twitter so I know that if I could do it on my laptop that would be even more discreet than having to pull my phone out.” Another student notes that she understands the policy against cell phones being used in class, but she admits to taking a peek every now and then to check Facebook and Twitter; she feels that she is less likely to get in trouble using her phone rather than attempting to check off-limit sites on her laptop. She asserts, “I don’t want to get in trouble at school so I’d rather do it on my phone and if I get caught then I get caught, but I’m not going to do it on something that [school administrators] can track down.” Students continually mention how social they are and that they thoroughly enjoy connecting with each other and staying in touch with friends: “We like to do social networking a lot so we’ll try to find any access point where we can connect with each other...mostly that’s why the Internet tempts us to do things we’re not supposed to.” This strong desire to be social is reflected in the students’ admission that if content was not blocked, they would likely be distracted by sites like Facebook and Twitter.

**Avoiding Distractions Outside of School**

Less than half of the students interviewed believe that learning to avoid online distractions at school affects how well students avoid distractions outside of school. Three traditional students and three AP/honors students (38%) agree that managing distraction at school plays a role in how well they avoid distractions at home, work, or other locations such as cafes or the library. Of those who believe that avoiding distractions at school helps them avoid distractions outside of school, they mention telling family members that they cannot do chores until they complete their school work or telling themselves that they must remember what is important in the grand scheme of things. As one student asserts, “I guess that self-
discipline…when you’re outside of school and you feel like ‘Oh I want to do this’…but at the same time I’ve got some school work I’ve got to get done.”

Students discuss how they have to have willpower when it comes to avoiding distractions outside of school. One traditional student notes, “If you have the willpower to avoid it at any other place, you should be able to avoid it at home. It’s more of what you think.” This willpower will come in handy after the student moves on to future learning environments, whether that is through online college courses or through face-to-face college courses. One traditional student notes that because he is learning to avoid the distraction in small classroom courses, he will be able to transfer this mental state to university classes of hundreds of students. Even though students have no blocked content at home, some find that because certain distracting content is blocked at school, they are better at abstaining from it at home until their work is finished.

Of those who believe that avoiding distractions at school does not help them avoid distractions outside of school, they mention the fact that unlike their school laptops, their home computers do not have filters. Students also report having a “completely different mindset” at home and viewing home “as the time I have to do some stuff I want to do.” Students also note how having fun sites blocked makes them more eager to get home and check their personal Facebook and Twitter accounts and see what they missed during the day, such as new dating relationships, a potential fight between peers, or even just a new message from a friend on their wall. One AP/honors student admits that “regardless of what kids say nowadays we do worry about…what’s going on [regarding online social interactions].” When asked what exactly distracts him at home, one traditional student says,
“The ability to go to the refrigerator and get something to drink, or chat online. But I still do my work, like multitask, it’s just I do more of what I [want] at home than at school most of the time.” It is important for teachers to recognize that although students are distracted at home, they still get their work done, just within a less rigidly structured manner. Some students are distracted more at school than at home while completing assignments; one traditional student comments, “I’m less distracted [at home] because I have only me to worry about…I know if I’m studying no one’s going to mess with me because they know I’m studying.” Parents and teachers must acknowledge that although some students believe that learning to avoid online distractions at school affects their distraction avoidance at home, there are typically more opportunities for students to be distracted at home.

**Reading Online vs. Print**

When asked if they prefer reading online or printed text, students generally prefer reading printed text. Seven AP/honors students and five traditional students (75%) find that reading textbooks and worksheets is far less distracting than reading from a laptop. One technical reason for this preference is the small screen size on the students’ laptops, which can sometimes lead to eye strain. They also prefer to read a document without having to scroll down so often and lose their place. An AP/honors student remarks, “By the time you get good and comfortable back in the story, you’ve got to scroll again and then you’ve got to get back into the groove.” It is important to note, however, that more students might prefer to read online if there were different tools available such as a kindle or iPad.

Another technical issue is the concern students feel regarding potential computer issues: “When I had a notebook my notebook wasn’t crashing; I could just flip back to it.”
One student notes that familiarity with the printed texts could be the cause of his print preference: “I just like having that printed material in front of me because I can sit down and focus on it better and I guess that’s because that’s what I was doing when I was a kid instead of using computers.” He also notes that he learned “When kids actually write instead of typing, it makes the brain function better.” There is evidence that handwriting has a more positive effect on memory than typing (Longcamp, Boucard, Gilhodes, & Velay, 2006). Further, students enjoy the tactile experience of holding a book. One traditional student notes that with printed text, he can read and put his finger on the page as he moves from sentence to sentence. Like other students, he also ascribes his preference for print to his past experience: “It’s something I’m used to doing since we first started reading.”

One student expresses a similar sentiment and refuses to take notes on the laptop: “To this day I take notes on paper. I don’t take notes on my computer because if a computer crashes, what do we do? If all else fails, we still have paper.” Some students like to read on laptops while listening to music; one traditional student says, “I can’t deal with it being too silent. So when I actually read stuff on the computer it’s much better for me because I can listen to music and stick headphones in and read at the same time and focus completely better than me just in a classroom silent and reading a book.”

Finally, the majority of students prefer reading printed text because a book or magazine provides fewer distractions than reading online. One honors student discusses how online reading “causes a big distraction because you can get to other things besides just reading a text; you can just veer off anywhere you want to go.” This student admits that there are “pros and cons” to reading online. Another honors student is more tempted to get off task
when reading online: “You see ads and stuff and you want to click on that.” Another honors students notes that when reading online, she is always thinking of the other work she has to do and is tempted to skim the reading rather than truly digest the content. Student responses point toward the self-regulatory act of coding certain responses as hot and cold (see Chapter 2). Students seem to code distractions (typically hot items) as cold in order to achieve the hot goal of completing a reading assignment (Metcalf & Mischel, 1999). By teaching self-regulation strategies, such as setting goals and reaching them, teachers may be able to help students manage distraction by promoting self-regulation and self-discipline.

**Advantages of 1:1 Learning**

Students believe that being involved in a 1:1 initiative is extremely useful for their future college and career goals. Students recognize that they are in a unique and fortunate position by attending a school that is a recipient of the IMPACT grant. One AP/honors student remarks, “My uncle’s a teacher and he still uses chalkboards and he was asking my mom for overhead sheets one day and she’s like, ‘We got rid of those ten years ago.’” One traditional student can see how becoming tech-savvy will help her in future endeavors: “You can even go to a gas station and you have to punch it in on a computer so it’s going to help because it’s gradually moving me forward to the future…but as far as distraction goes, yes, it can be a big distraction.” This student expresses the typical opinion about technology and distraction, which communicates a need to learn how to effectively utilize technology while discovering ways to manage the many electronic distractions that are available through high-tech equipment and the World Wide Web.

Students note that technology access leads to a difference in student interactions and
academic success. They are able to gather a group of peers, open their laptops, and discuss their classes anywhere. One student discusses how his online courses afford him the opportunity to explore new languages such as Arabic; he also notes how he enjoys when teachers video chat with others across the state and entire world. He also raves about ActivBoards and how teachers use them for flip charts and PowerPoint presentations. Also, students like being able to instantly find the answer to questions that arise in class (Johnson, 2010). One student remarks, “We do games like Jeopardy and stuff so it makes learning easier and more fun but I mean at the same time, when you have more options you also have more distractions.” One traditional student asserts that there is a time and a place for laptop use and that his teachers do a good job of not forcing the class to use laptops every day; he notes that he would rather not use the laptop for math since paper and pencil are more appropriate, but would prefer to work on the laptop in English and Social Studies. Numerous students comment on the dichotomy of thoroughly enjoying laptops and realizing their value while also recognizing that new technology fills their world with distractions.

**Concerns about Distraction and Technology**

Students express sophisticated concerns regarding technology and distractions in general. While they understand that global competition leads to the need to obtain information literacy and technical skills, students also feel that their world is full of distractions that did not used to exist. Regarding technology in general, one student remarks, “It’s about to take over our whole entire school.” Another student finds that the temptation of so many sources at her fingertips is difficult to fight. Regarding laptops, she would be fine if the school district would “just take them away.” A traditional student expresses a similar
sentiment about laptops, wishing she could “have it back to the way it was when we were in middle school, just pencil and paper.”

Another concern voiced by students is that they are not doing as much higher level thinking as generations before them. One AP/honors student notes one of the concerns she has for her generation: “Generations before us have better critical thinking skills and problem-solving skills because they had to go do that with their own brains and books; they had to research and actually do the harder work, versus us, ‘Oh, I’ll just jump on Google.’”

Another AP/honors student believes that technology access is great but that it has a tendency to make students lazy. He mentions this same concern: “It’s great that we have it but sometimes we just need to get up and research things for ourselves rather than slide back and sit on the computer all day.” It is important to note that perhaps teachers could do a better job illustrating how the computer is taking over low-level search tasks, which could free up time to focus one more higher-level synthesis and evaluative tasks.

One student notes that the blocked content is a good thing, but it also hinders her ability to teach herself distraction avoidance. She feels that some students would not take advantage of a little leeway, but she realizes the majority of students probably would. She remarks, “We can’t even design our computer the way we want.” This lack of personalization capabilities is echoed in other 1:1 literature (Corn, 2009). One self-described “techie” practically lives on his laptop and notes, “The only issue with technology is that technology in general has issues.” Indeed, this issue is one of the most noted from students regarding the way they cannot trust technology 100% of the time due to Internet outages, losing files, and/or running out of battery life.
Table 4.1

*Summary of student feedback by topic.*

<table>
<thead>
<tr>
<th>Topic</th>
<th>Student Sentiment</th>
</tr>
</thead>
</table>
| How Teachers Help Students Avoid Distractions | • We like when teachers tell us when to open laptops and when to close them. We also are less tempted when we have challenging, engaging assignments with strict deadlines. Teachers should not be afraid to try new things with technology.  
• We do not want to be lectured at for long periods of time.  
• Every assignment should “count.”  
• We love seeing our grades online. |
| How Students Deal with Distractions        | • We are less distracted when we keep long-term goals in mind.  
• We use self-regulatory techniques to complete work.  
• We like having the freedom to open other windows when completing work, especially for music or online assistance.  
• We like making use of different electronic features when brainstorming and drafting.  
• We need a break now and then from intense mental work; this is why we walk around the room or visit another website.  
• Half of us prefer to focus on solely one task when using our laptops; the other half like being able to switch to another assignment if they have an idea for that and not get in trouble. |
| How Laptops Help Students Avoid Distractions | • Seeing our grades online helps us see what we need to improve.  
• Listening to music helps some of us focus on the task at hand. |
| Online Temptations and the Need to Monitor  | • We are extremely tempted by online distractions and over half of us have tried to hide what we are doing when you walk by our desk.  
• We are often tempted to work on another class assignment than visit a site for entertainment.  
• Most of us do not mind the school wide filters and believe that knowing someone is watching us keeps us away from negative web sites.  
• You might have caught us using our phones to check Facebook or Twitter.  
• We love being social when working in class. |
Table 4.1 Continued

<table>
<thead>
<tr>
<th>Topic</th>
<th>Student Sentiment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoiding Distractions Outside of School</td>
<td>• A few of us agree that using the laptop at school helps with other distractions, but most of us use the computer differently at home than at school.</td>
</tr>
<tr>
<td></td>
<td>• The 38% of us who believe that using the laptop helps with other distractions believe so primarily because we are accustomed to filters at school and this helps us to avoid distractions until work is finished.</td>
</tr>
<tr>
<td>Reading Online versus Printed Text</td>
<td>• We generally prefer reading printed text, with the exception of a few of us who like using music to help us focus.</td>
</tr>
<tr>
<td>Advantages of 1:1 Learning</td>
<td>• We are fortunate to have the IMPACT grant to learn skills that we will use throughout our lives, but also see that high-tech access often leads to distraction.</td>
</tr>
<tr>
<td></td>
<td>• We love when our teachers use technology in a smart way.</td>
</tr>
<tr>
<td>Concerns about Distraction and Technology</td>
<td>• We understand that we must learn technology skills such as information and technology literacy, but we do not always enjoy it.</td>
</tr>
<tr>
<td></td>
<td>• We realize our need to develop higher level thinking skills and to utilize the laptop as a tool that can lead to this.</td>
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</tbody>
</table>

Teachers and Distraction Management

Interviews with three English teachers of English IV, Honors English IV, and AP English IV revealed great insight into their day-to-day experiences with student distraction and technology in general. I met with them once for an interview before interviewing students and observing their classes. After data collection was complete, I met with them again to debrief and member check in order to ensure reliability. These teachers are very busy people and I am thankful that they were gracious enough to sit down with me and share their insights about managing distraction in a 1:1 classroom.
How Teachers Help Students to Avoid Distractions

When asked how they help students deal with online distractions at school, teachers reveal several unique solutions. The primary way teachers help their students is to create lessons and assignments that are so engaging that students do not desire any outside stimulation. Along with keeping the lesson engaging, teachers seek to keep their students so busy that they do not have time to seek distractions online. One key way teachers do this is through deadlines; when a student sees the deadline looming, particularly in discussion boards when his or her peers have already posted their assignments, he or she focuses on the task at hand. Teachers also find that walking around the room and monitoring what students are doing helps them to stay on task. One teacher mentions her goal of teaching from “bell to bell,” using a system in which students move on to another task if they have completed the first one. Another teacher mentions that students rarely have problems avoiding entertainment-related online distractions; instead, they are likely to be completing assignments for another teacher.

When asked about the processes students use to complete assignments on their laptops, teachers reveal a variety of methods. Students typically submit assignments to an online drop box, which helps them to stay on task and to submit the assignment before the due date. Some teachers allow students to listen to music, which students request and seem to thoroughly enjoy. Teachers also try to help students focus by utilizing the physical space in the classroom; they move the desks around and allow students to get into corners and work alone away from everyone else. This is interesting, as technology often leads teachers to rearrange the furniture in their class toward a more group learning style (Mitchell, 2004).
sample that I observed, however, used a row design for the most part (see Figure 4.1).

Teachers may find that rearranging furniture into more collaborative work spaces can have a positive effect on learning. Students also find incentive to complete assignments by viewing their grade faster through online grading. Teachers note that students appreciate receiving their grades online rather than putting a piece of paper on their desk where other people can potentially see the grade. Because students are continually monitoring their online grades, teachers feel that this method of grading leads to more accuracy when it comes to assessing students. It is important for teachers to remember that there are numerous creative methods they can use to help students avoid distraction.

*Figure 4.1. Design of classroom layout (n=8).*

**How Laptops Help Students Avoid Distractions**

When asked if using the laptops has helped their students learn to deal with distraction in general, teachers generally agree that the laptop helps with distraction in multiple, often indirect, ways. One teacher asserts that the block schedule, which leads to 90-
minute classes, makes for a lengthy class period in which students might become more easily
distracted from the lesson. By having the laptop in class, this teacher notes that students seem
more motivated and more interested in the classroom content. Another teacher believes the
laptops have taught students “how to multitask and still be effective.” Teachers believe the
skill of multitasking is one that needs more attention, particularly for males (Wilson, 2005).
Another key way laptops help students avoid distractions is by the types of assignments
students may complete using the tool: for example, strict deadlines and peer accountability
provide strategic ways for teachers to ensure that students divide their focus in a wise
manner. Through tools like discussion boards, Angel makes these strategies easy for teachers
to utilize. The collaborative learning that takes place with laptops tends to make students
question what their peers are thinking. By leading students to ask one another, “Why did you
put that?” and “Why didn’t you put this?,” access to laptops and the Angel learning
management system lead toward more critical thinking. One teacher defines teaching as “a
conversation about thinking. And I think it you use the discussion forum or an ActivBoard,
for example, it does open up the possibilities for that.” Another teacher comments on the fun
one may have while using the varied activities that Angel permits. She may use the quiz
feature one day, for instance, and the next day use the live chat feature. She believes that
using multiple features like this helps to keep students guessing about what class activity will
occur. By utilizing the captivating power of technology in class, teachers find that they can
pull students’ attention toward the lesson and away from distractions.

**Online Temptations and the Need to Monitor**

All teachers agree that the Internet tempts students to do something non-instructional
during class like check personal e-mail or social networking sites. One teacher notes that a student in another class was recently disciplined for attempting to log on to Facebook twelve times in one class period. The school has filters that block sites such as Facebook, but students often use proxies to gain access to their favorite personal websites. Teachers note that when using computers in class, they notice students minimizing windows quickly or trying to hide what they are doing when the teacher walks by. The solution to this problem for most teachers is to keep students so busy that they do not have time to check personal e-mail or social networking sites. Teachers note that “students should be minimizing windows relevant to the course, such as Angel or online research.” One teacher likens minimizing windows to his or her own experience: “That’s just like when we were in school and people would try to hide their cheat sheets.” Teachers understand that students are frequently tempted by the Internet and should be monitored.

Because of so many online distractions, teachers sense the need to monitor students while they use laptops in class. Teachers generally feel that most students stay within the parameters of the lesson when using the laptop, whereas there are often a few who like to visit other sites. One teacher likes to have a time in class when laptops are closed and all eyes are on the teacher. This teacher notes that in order to monitor well, “You have to be a vulture. You have to swoop down and you have to make sure that when you say the laptop is down, it’s down.” This teacher also teaches upper and lower-level honors courses and finds that distraction affects each course in a different way: “It seems to happen more for me with my seniors than with my ninth graders and tenth graders and it may be that ninth graders are fearful that the teacher will catch them; seniors, maybe it doesn’t matter so much.” This
coincides with information from student interviews, which suggests that seniors might feel the need to work on other assignments or check personal e-mail for responses from prospective colleges. When teaching small classes with 10-15 students, teachers have no trouble walking around and monitoring what they are doing; when the class size increases to 30 students, however, teachers have more difficulty monitoring. Teachers note that one method of punishment is confiscating the laptop for 24 hours, but fortunately they do not have to do this very often. It is important for teachers to learn monitoring techniques to help students avoid online distraction in class.

Avoiding Distractions Outside of School

When asked if they believe that learning to avoid online distractions at school affects how well students avoid distractions outside of school, teachers assert that they believe there is more structure at school than at home. Overall, student interview data supports this view. Teachers think it would be great if students could connect the skills they learn in school to their at-home life, but as one teacher notes, “I’m a strong believer that once the bell rings I don’t think we have too much influence over the kids.” Another teacher comments on the way so much of students’ lives are fragmented through fast-paced newscasts, music videos, and even film. This teacher mentions the shortened length of movie scenes and the fact that movie clips are much more abbreviated and fragmented than they were in the past. The teacher asserts, “There are people that think technology is the center of the universe. But I’m not so sure it doesn’t have its negatives that sort of fracture unity of what you do and how you act and how you feel.” This teacher acknowledges that new gadgets such as iPods, cell phones, and mp3 players have become extremely popular among students. The teacher notes
that students seek to gain a “sound byte of information rather than digesting a concept that requires a longer attention span.” The teacher worries that students will have difficulty creating a foundation for their own identity, as that cannot be gained through “sound bytes.”

When asked how often students focus on just one task when they use the laptop in class, teachers agree that most students do a good job staying focused in class. They tend to stay focused as long as there is a deadline looming ahead. Teachers make use of the Angel course management system, particularly for having students respond to a discussion board question. One teacher, for example, asks students to post about different forms of evil in the world and then research how they would go about trying to solve some of these problems. Student responses to the discussion board are a great way to begin class the next day because they see their work published on the screen. This teacher notes that students would prefer to leave the school day with no homework, which is another factor in how focused they are during class.

Students often have different windows open for the purpose of finding items to use in their projects, which may involve images, music, or video. They learn to multitask when project-based learning occurs. For example, one project involves researching the time period of Julius Caesar along with the 50 years that followed. This teacher allows students to submit assignments in multiple ways, such as Glogsters, PowerPoint presentations, or videos; sometimes assignments are completed in groups and sometimes individually (Corn, Tagsold, & Patel, 2011). Students are focused on completing one assignment most of the time, according to teachers. Teachers seem to have a realistic picture of how students use technology outside of school.
Reading Online vs. Print

When asked if they believe students focus better when reading online or when reading printed text like a book or magazine, teachers assert that it heavily depends on the skill set of the student and the purposes for the reading. One teacher reports that most honors students prefer reading online, whereas traditional students prefer printed text. Based on student interviews, however, the majority from both groups prefers reading printed text. One teacher believes that when one has more literacy skills, he or she can read either online or printed text successfully. Cultural differences may play a role in one’s reading preference; one teacher notes that because online reading is easily translated, Hispanic students tend to prefer online reading and are particularly fond of creating online presentations rather than standing up to present in front of the class. This teacher hears students say they like online reading better because they can use it more efficiently for their own needs; for example, they can highlight text, electronically write on the document, and copy and paste pieces of text to their own documents. Another teacher notes that preferences differ based on grade level; this difference might occur based on familiarity: “…that’s what we’ve done in the past; that’s the usual thing...there’s something about a book in your hand that’s secure and comforting.” This teacher also takes into account the small screen size of student laptops (they use Dell Minis) and believes this could be another reason for some students opting to read printed text rather than online text. Only one teacher comments about writing as well as reading; this teacher allows students the option to do prewriting and drafting electronically or on printed paper, and finds that a lot of students would prefer to draft by hand rather than on the laptop. Teachers believe that a variety of factors play a role in one’s online versus print reading
preferences; they realize, however, that students should experience both methods in high school.

**Advantages of 1:1 Learning**

Teachers believe that learning to deal with distractions in school is important and will help them in their future endeavors. They feel that laptops can greatly enhance learning opportunities for students as long as students have basic foundational knowledge as well. Teachers see students learning to be responsible, as they are the sole keepers and protectors of their laptops. This develops a sense of ownership for the student, which teachers believe should be acknowledged. All of the sites students visit online can be checked by the school technician; this fact makes them think twice about viewing inappropriate websites or making unsuitable decisions online. Another key part of being responsible users of their laptops involves bringing laptops to class fully charged, particularly for morning classes. Further, because assignments may be submitted electronically, there is a “no excuses” mentality among students (Corn, Tagsold, & Patel, 2011). One teacher notes that e-mail has increased his ability to communicate with students “human to human.” This teacher can communicate something personal through email, such as a concern over missing work or encouragement during a tough time. Teaching students responsibility is just one advantage of participating in a 1:1 initiative.

Teachers particularly want students to learn that there is a time to check personal email and Facebook and a time to focus on class activities. Teachers assert that students need all the time management training they can get, and they believe that illustrating how to manage their online worlds helps with this skill. Learning these lessons while in a 1:1
environment will help them as they compete in a global economy in the future. One teacher constantly reminds students that they are not only competing with their classmates, but with peers around the world.

While it can be discouraging when teachers must spend class time managing students’ online behavior, teachers keep in mind that “There was always a slick student before technology that you would have to monitor and pay close attention to.” Another teacher expresses sentiments about distractions caused by technology: “Distractions…there will always be distractions. We try to impress upon the kids how important it is to just be responsible for your actions. [We tell them] it’s your education!” Although the 1:1 initiative offers numerous advantages, teachers also express concerns related to distraction caused by new technology.

**Concerns about Distraction and Technology**

Teachers voice concerns about distraction and technology in general. One teacher mentions the issue of multiple students recently being caught cheating on an online test by Googling the answers. With regard to cheating, she notes, “If it wasn’t technology, it would be something else.” This connects with teachers’ recommendations to create assignments which challenge students and lead them into more higher level thinking activities than a simple Google search could provide. One teacher states, “I want to challenge them... It should be frustrating a little bit. It should cause a little problem. It should encourage them to think.” Relatedly, teachers mention the need to remember that the laptop is a tool, and the potential of the tool is only realized when students and teachers desire to learn and work hard to demonstrate their mastery of concepts.
Teachers also voiced concerns about the lack of critical thinking that sometimes occurs when students have 24-7 access to technology. They want students to use the technology but to also have the foundational knowledge that is required to advance through the levels of Bloom’s taxonomy. One teacher notes, “You know it starts at the bottom, but there are these other things way up here, and I want them to be able to evaluate, think about consequences, think about decisions.” This idea of evaluating different sources and considering outcomes is one of the key standards found within the National Educational Technology Standards (International Society for Technology in Education, 2010). When a student is contemplating which college to attend, one teacher takes a literal route and advises students to really think about the meaning of the word “decide,” which this teacher defines as “to kill off all the other choices.”

The final concern for teachers involves the integration of technology into teaching as well as the workforce. They understand the benefits and drawbacks of a global workforce and seek to prepare their students for it. Teachers live in an interesting time in history, when humans see the first impacts of the Internet, from having access to vast amounts of information to seeing people lose jobs because they have been replaced by a machine. Some teachers initially found the 1:1 idea overwhelming at first, as teachers can be resistant to change; however, as one teacher remarks, “When it’s mandated, you go with the flow and then you figure out how to make it work for your classroom and your kids.” Another teacher reflects a similar sentiment: “We must be open-minded as teachers because the students are our future leaders.”
Table 4.2

Summary of teacher sentiments by topic.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Teacher Sentiment</th>
</tr>
</thead>
</table>
| How Teachers Help Students Avoid Distractions | • Create lessons and assignments that are so engaging that students do not desire any outside stimulation.  
• Keep students so busy that they do not have time to seek distractions online (deadlines, teach from bell to bell). Walk around and monitor.  
• Collect assignments through online drop box. Allow students to move around classroom to work or listen to their preferred music while doing individual assignments.  
• Grade online (more incentive).  
• Emphasize that technology is a tool that can take care of lower-level thinking tasks to free up time for higher-level thinking. |
| How Laptops Help Students Avoid Distractions | • Keep students interested in lesson for 90-minute classes.  
• Teaches how to effectively multitask.  
• Use the Angel discussion boards (strict deadlines, peer accountability). |
| Online Temptations and the Need to Monitor  | • All teachers agree that the Internet tempts students.  
• Seniors are more likely to try to hide windows than lower grade levels.  
• Small classes allow for easier monitoring. |
| Avoiding Distractions Outside of School     | • Teachers believe there is more structure at school than at home.  
• Students’ lives are fragmented due to technology.  
• Most of the time, students are focused on completing one assignment. |
| Reading Online versus Printed Text          | • Honors students have less difficulty reading online than traditional students.  
• Literacy skills determine preference. |
Table 4.2 Continued

<table>
<thead>
<tr>
<th>Topic</th>
<th>Teacher Sentiment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Online versus Printed Text</td>
<td>• Small screens contribute to the desire for most to read on print.</td>
</tr>
<tr>
<td>Advantages of 1:1 Learning</td>
<td>• Laptops are TOOLS that can greatly enhance learning opportunities as long as students have basic foundational knowledge as well.</td>
</tr>
<tr>
<td></td>
<td>• Laptops teach responsibility.</td>
</tr>
<tr>
<td></td>
<td>• Teachers want students to learn online time management skills.</td>
</tr>
<tr>
<td>Concerns about Distraction and Technology</td>
<td>• Online cheating sometimes occurs.</td>
</tr>
<tr>
<td></td>
<td>• Lack of critical thinking sometimes occurs when students have 24-7 access to technology.</td>
</tr>
<tr>
<td></td>
<td>• Teachers understand the benefits and drawbacks of a global workforce and seek to prepare their students for it.</td>
</tr>
</tbody>
</table>

**Observations**

During visits to the sample school, eight total classes were observed (see Figure 4.2); the majority of classes took place in classrooms (see Figure 4.3).

*Figure 4.2. Designation of classroom observations (n=8).*
Figure 4.3. Designation of learning environment during observations (n=8).

All teachers utilize some form of independent work, and 25% of teachers have students work in pairs (see Figure 4.4). This type of grouping is compatible with the class work teachers assign. Independent work is appropriate for most assignments, such as writing a letter of intent or resume for the graduation project. Interview data suggests that completing independent work as part of a larger project may aid distraction management.

Figure 4.4. Designation of student grouping during observations (n=8).
Interestingly, there are two dominant types of teacher activities (for which technology was used) during observations: lecture and assessment. Twenty-five percent of observations utilize technology for lecture, while 88% utilize technology for assessment (see Figure 4.5). Teachers use technology to assess in two different ways; one way involves having students submit a project (such as a project with a rubric), and the other is by having students submit a written response (like post on the discussion board). This includes assessing written work such as discussion post responses, letters of intent, or resumes (which are part of the graduation project). Sixty-three percent of teachers assess with a product, and 13% use written response as their assessment method (see Figure 4.6). This observational data merges with the desire teachers express during interviews to use technology for more project-based learning.

*Figure 4.5. Type of teacher activities during observations (n=8).*
Teachers use the technology as a tool for various activities. The primary activity for which technology is used is communication. By labeling the activity “communication,” the activity could include document preparation, email, presentation, or web development. Fifty percent of teachers and 75% of students use technology to communicate (see Figure 4.7). The primary way students communicate is through document preparation or email. The next most popular activity for which technology is used is summative assessment. This is illustrated through students having to submit their assignments either through Angel or email. Thirty-eight percent of teachers and 63% of students use the technology primarily for summative assessment (see Figure 4.7). Finally, the third most popular activity for which technology is used is project-based activities; 25% of teachers and 13% of students use the technology in this way (see Figure 4.7). Interview data suggests that having students submit assignments through Angel can aid student distraction management.
Figure 4.7. Activity for which technology is used during observations (n=8).

The primary technology hardware used to teach the above assignments included display (which includes the digital projector, digital white board, television, TV-link, or printer), desktop, and laptop computers. Although both teachers and student received laptops through the initiative, the laptop is the most frequently used hardware by students (75%) and the desktop computer is the most frequently used hardware by teachers (50%). Hardware used to display is used by 9% of classrooms (see Figure 4.8). The primary software used by students includes productivity software, which involves the use of database, presentation, spreadsheet, word processing. Seventy-five percent of students and 50% of teachers use productivity software. The next most popular software used by students is Web applications, which includes the course management system, Angel. Sixty-three percent of students and 63% of teachers use Web applications during observations (see Figure 4.9).
Figure 4.8. Technology hardware used during observations (n=8).

Figure 4.9. Technology software used during observations (n=8).

Distractions Observed in Class

During classroom observations, the researcher did not observe a great deal of online
distraction among students. This could be the result of the researcher’s presence in class or
because their teacher warned them to be on their best behavior when the researcher visited
the classroom; it could also be the result of the teachers assigning the students challenging
work so that they would not have time to get distracted. Some students visit the Angel
website and other assignment-related web content, but only three students out of 64 (two in
an honors class and one in a traditional class) visit personal websites or online material
related to another course. In a traditional class, students become more distracted by their
peers than by online temptations. This meshes well with student interview data, which asserts
the idea of peers often being more distracting than electronic or online content. Overall
engagement is high in each class; 75% of class observations reveal that all students are
engaged in the lesson. The remaining 25% of class observations reveal that the majority (at
least 80%) of students in the class are engaged. These students illustrate sustained behavioral
involvement and exertion of effort and concentration.

**Differences between AP/Honors and Traditional Students**

There is a lack of research on 1:1 learning and its effects on English language arts
classes, particularly for those interested in high school laptop initiatives and their effects on
high- and low-achieving English language arts courses (McNabb, 2005). Educational
research literature is mixed with regard to whether laptops are integrated more successfully
in classes of low- and high-achieving designations, and the literature is especially mixed
pertaining to the effects of the technology on student achievement (Haynes, 1996; Wurst,
Smarkola, & Gaffney, 2008). In this sample, I have combined AP/honors classes as one case
and traditional classes as one case. While AP/honors classes have many similarities, I seek to
discuss how these classes differ in the ways laptops are used with regard to student
distraction. This section will report on key differences between teacher and student experiences in AP/honors and traditional classes through the lens of four previously noted categories: Online temptations and the need to monitor, Reading Online versus Print, Advantages of 1:1 Learning, and Concerns about Distraction and Technology. This section answers research sub question 1c: How do these experiences differ based on achievement level (honors vs. non-honors)?

**Online Temptations and the Need to Monitor**

Teachers and students note no real difference with regard to differing levels of distraction between honors and traditional classes. Teachers of both class designations experience the majority of students staying focused during assignments while a small portion of students seek outside sources of distraction. Half of the students, however, admit that they have minimized windows quickly or tried to hide what they are doing when the teacher walks by. It seems that although teachers perceive that students are focused on their classroom while using the laptop, 81% of students admit that the Internet tempts them to do something non-instructional during class, like check personal e-mail or social networking sites. Both traditional and honors students are tempted by the Internet, even though the sample school uses filters to block their favorite sites like Facebook and Twitter.

Both traditional and honors teachers feel the need to monitor students while they use the laptop during class. Honors teachers are more likely to have students open the laptop for the assignment and close it immediately after the need for the technology is fulfilled; this method is also suggested in *Wireless in the Classroom: Advice for Faculty*. Indeed, classroom observations reveal that AP students have a “no laptop time” that is not observed
in any other classes. This is an intriguing finding, as one might suspect that AP/Honors students need less monitoring than traditional students. Perhaps the reason for this is the notion that AP/Honors may become bored faster than traditional students and more likely to seek outside stimulation. Another explanation could simply be the individual teaching style of this instructor. When comparing engagement of AP/honors classes to traditional classes, there was no difference found between the two student groups (see Figures 4.10 and 4.11). Both students and teachers confirm that this method keeps students from getting terribly distracted because the pressure of the deadline forces them to complete the assignment. Further, both traditional and AP/honors teachers utilize the power of deadlines to decrease opportunities for distraction. AP/honors teachers note that it is easier to monitor students when classes are small. It is during the classes with 30 students that teachers find it difficult to monitor their online activity.

![Figure 4.10. Engagement measures of AP/honors classes.](image)
Teachers note differences in reading preferences between honors and traditional students, but student interview data suggest that both groups prefer reading printed text. One teacher’s experience reveals that honors students prefer online reading and traditional students prefer printed text. One teacher instructs only honors classes and finds that the preference to read printed versus online text is not based on class designations, but rather on grade level and the amount of experience one has previously had with laptops. From this teacher’s perspective, seniors are better able to read online than the sophomores. Another teacher who instructs only traditional students believes cultural background, individual skill set, and assignment purpose determine reading preferences. Students essentially agree with their teachers on this issue. Seventy-five percent of students prefer reading printed text rather than online text. While those who prefer printed text can see benefits to reading online, they prefer the lack of distraction, tactile experience, and familiarity of printed text such as a book.
or magazine. For the 25% of students who prefer reading online, they cite benefits such as being able to listen to music which helps them avoid the distracting voices of classmates and being able to use a dictionary of search engine for assistance. Students acknowledge that their preference for printed text could be due to their familiarity with this reading method; their school did, after all, receive the laptops less than three years ago, so reading online during class is a relatively new activity for them. There is little difference between honors and traditional students with regard to reading preferences; both groups are likely to choose a printed book for academic reading rather than an online text.

**Advantages of 1:1 Learning**

Both honors and traditional teachers agree that there are various advantages and concerns when it comes to implementing new technology into the classroom. Teachers of traditional classrooms mention the need for students to understand technology and know how to use it in the future. They specifically point to the global competition that students will face when they enter the workforce or college. They discuss how the laptop helps student complete their graduation project, to which one teacher devotes up to 40% of class time. Indeed, the class activity observed during observations of traditional classrooms is related to the graduation project. Teachers use the laptop to help students with some of the primary products of the graduation project, including the letter of intent, the resume, and the final presentation (students may use PowerPoint or Prezi). Teachers of traditional classrooms especially note the difficulty that students and teachers may experience when a school adopts a laptop initiative.
Concerns about Distraction and Technology

A change such as a laptop initiative is difficult for all school employees, from administrators to teachers. Teachers of traditional students discuss how laptops may complicate learning as well as improve it. They mention how students sometimes succumb to distractions such as music or games. They acknowledge that the school wide filters help a great deal because students cannot get on wildly popular sites like Facebook, Twitter, or YouTube. One traditional teacher recognizes that students may focus better when they listen to music, but this teacher does not allow it, particularly for an inclusion class because the teacher cannot monitor the music they listen to when they use headphones.

The AP/honors teachers report similar concerns as the traditional teachers, but are more likely to allow students to listen to music because it helps some students focus better. The greatest concern for honors teachers is the effect of technology on the mind and society in general. They note the fragmented lives that students lead, lives in which they are bombarded by numerous sources of information on a constant basis. They wonder what this will do to students’ ability to think deeply and to operate on all levels of Bloom’s taxonomy. One AP/honors teacher is especially concerned about the employment opportunities for all those people who do not possess the skill of information and technology literacy (Partnership for 21st Century Skills, 2003).

Contradictions

The data suggest contradictions between teacher and student perceptions. Although some teachers believe students would prefer to read online, most students prefer reading printed text. This is likely due to the small screen size of the netbooks used by students in this
sample. Most teachers think that music is harmful and might distract students, but students often find it helpful in keeping them focused when working on individual assignments. Teachers believe the majority of students are on-task most of the time, which students agree with. Students, however, emphasize that they are very tempted to get off-task and appreciate when teachers make it more difficult (through strict deadlines or challenging assignments) for this to happen. Paradoxically, while it is wise to keep students busy, research supports the need for a mental break when working. This can enhance student engagement and improve performance, particularly for this sample which runs on the block schedule, which consists of four 90-minute classes during the school day. One may hypothesize the engagement levels would be higher in AP/Honors classes, but this is not the case. There was little difference noted between the AP/Honors classes and traditional classes, other than the greater likelihood that AP/Honors teachers would enforce a closed laptop time and be more concerned about the potentially harmful effect of technology. This method of aiding distraction management is intriguing, considering that one might think AP/Honors students do not need as much forced regulation as traditional students might need.

**Summary of Findings**

The data collected during this study have helped to answer the research questions, which include: How do students and teachers manage distraction in a 1:1 environment? The first section answers research sub question 1a: How do English IV students manage distraction when working with technology? The second section answers research sub question 1b: How do English IV teachers manage distraction when working with technology? The third section answers research sub question 1c: How do these experiences differ based
on achievement level (honors vs. non-honors)? The table below designates key themes derived from findings.

Table 4.3

*Summary of research sub questions and themes derived from findings.*

<table>
<thead>
<tr>
<th>Research Sub Question</th>
<th>Finding</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a. How do English IV students manage distraction when working with technology?</td>
<td>Students… • use self-regulatory techniques to complete work (such as keeping goals in mind). • listen to music and use online sources for assistance. • take mental and physical breaks.</td>
<td>• Manage distraction by incorporating projects that students enjoy. • Manage distraction by incorporating challenging assignments.</td>
</tr>
<tr>
<td>Research Sub Question</td>
<td>Finding</td>
<td>Theme</td>
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<tr>
<td>1a. How do English IV students manage distraction when working with technology?</td>
<td></td>
<td>• Manage distraction by promoting self-regulation, self-discipline.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Teachers and students are developing ways to manage distraction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Manage distraction by illustrating the relevance of technology.</td>
</tr>
<tr>
<td>1b. How do English IV teachers manage student distraction when working with technology?</td>
<td>Teachers…</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• enforce strict deadlines.</td>
<td>• Manage distraction by incorporating projects that students enjoy.</td>
</tr>
<tr>
<td></td>
<td>• assign challenging assignments.</td>
<td>• Manage distraction by incorporating challenging assignments.</td>
</tr>
<tr>
<td></td>
<td>• create lessons that capitalize on students’ social need to connect with peers.</td>
<td>• Teachers and students are developing ways to manage distraction.</td>
</tr>
<tr>
<td></td>
<td>• utilize new technologies in class.</td>
<td>• Manage distraction by illustrating the relevance of technology.</td>
</tr>
<tr>
<td></td>
<td>• use an online grading system (such as Angel course management system).</td>
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<tr>
<td></td>
<td>• advocate for filtering on student laptops during the school day.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• emphasize that the laptop is a tool which may take care of lower-level thinking tasks to free up time for higher-level thinking tasks.</td>
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</table>
Table 4.3 Continued

<table>
<thead>
<tr>
<th>Research Sub Question</th>
<th>Finding</th>
<th>Theme</th>
</tr>
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</table>
| 1c. How do these experiences differ based on achievement level (honors vs. non-honors)? | • Teachers of both class designations use similar techniques; the AP/honors teachers in this sample are more likely to have a “no laptop time.”  
• Whereas teachers of both designations can see positive effects of high-tech learning, AP/honors teachers are more concerned about the potentially harmful effect of technology on the mind and society in general. | • Manage distraction by incorporating projects that students enjoy.  
• Manage distraction by incorporating challenging assignments. |
| Contradictions        | • Students prefer reading on printed text, but some teachers disagree.  
• Students find listening to music helpful, but some teachers disagree.  
• Teachers do a great job helping students stay on task, but should recognize the need for mental breaks.  
• AP/Honors teachers use more forced methods for managing distraction. | • Manage distraction by incorporating projects that students enjoy.  
• Manage distraction by incorporating challenging assignments.  
• Manage distraction by promoting self-regulation, self-discipline.  
• Teachers and students are developing ways to manage distraction.  
• Manage distraction by illustrating the relevance of technology. |
Findings noted above help to describe the myriad ways teachers and students manage distraction in a high-tech environment. Chapter Five further discusses distraction in 1:1 settings, with special attention paid to the themes listed above.
CHAPTER FIVE: DISCUSSION

This study uses a multiple-case study design as a vehicle for answering the following research question: How do students and teachers manage distraction in a 1:1 environment? Sub questions include:

1a. How do English IV students manage distraction when working with technology?
1b. How do English IV teachers help students manage distraction when working with technology?
1c. How do these experiences differ based on achievement level (honors vs. non-honors)?

In this chapter, I advance five themes that emerged from the data: (a) Laptops make learning more fun, (b) Students are less distracted when assignments are challenging, (c) Students are likely more distracted in class than teachers think they are, (d) Teachers and students are developing ways to manage distraction, and (e) Teachers and students understand that technology is here to stay. In addition, I discuss how themes from this study impact instructional technology research in general. I conclude with a summary of this study’s limitations along with future research recommendations that may enable educators, researchers, and policy makers to address the challenges that arise when managing distraction and technology. A brief summary of findings is provided to capture major conclusions from this study.

Students manage distractions by using self-regulatory techniques to stay on task, such as goal setting and taking frequent mental breaks. Students may choose to read a printed text in order to avoid the online distractions that are available when reading online. For those who prefer reading online, they enjoy it because they can listen to music or use online resources for assistance.
The data reveals that teachers help students manage distraction using multiple techniques. These include having students close laptops when they are not in use, assigning challenging class work, and grading online through the Angel course management system. By grading student work online, teachers help students see exactly which assignments they have completed or not completed. When students see low grades for certain assignments, along with their total class average, they are more motivated to improve their performance and/or make up missed work. Teachers also allow students to take mental breaks, move around the room, and occasionally listen to music to aid concentration. There is one major external influence that affects how students manage distraction, and this is the school-wide Internet filter, which blocks sites such as Facebook and Twitter. Students realize that if they visit inappropriate sites, they may be punished, as each site they visit is viewable through school archives.

The data reveals few differences between how AP/honors students manage distraction and how traditional students manage distraction. Both groups of students experience online temptation during class, find it easier to read printed material rather than online text, and report that strict deadlines help them to stay focused on their class work. One primary difference is the way the AP/honors teachers in this study manage technology in class; these teachers have certain rules that traditional teachers do not use, such as having students close laptops when they are not being used for an assignment. Another interesting difference between honors and AP teachers is that the AP/honors teachers are more likely to allow students to listen to music while they work. The final difference lies in teachers’ general thoughts about distraction and technology. Both the traditional teachers and honors teachers
are concerned with the way 1:1 learning has the ability to improve learning or complicate it. AP/honors teachers are more concerned about technology’s potentially harmful impact on the mind and society in general. The reader should note that these differences may simply be a factor of how the individual teachers use distraction management strategies differently, rather than tying these differences solely to AP/honors and traditional class designations.

Themes

Manage Distraction by Incorporating Projects that Students Enjoy

All teachers note the engaging classroom possibilities inherent with 1:1 learning. For teachers with the block schedule, ninety minutes can be a long time for students to listen to a lecture/class discussion, complete a worksheet, or take a test without seeking online distractions. One teacher notes, “I believe [the laptop] has been used as a tool to sort of help what we do, sort of break up boredom with just the regular test.” Teachers assert that laptops help students stay engaged for a longer period of time during the 90-minute class. Teachers also find that assessing in multiple ways, such as Glogsters, PowerPoint presentations, or videos, works wonders for making learning more fun for students (Corn, Tagsold, & Patel, 2011). This type of involvement and sharing excites teachers because students perform better when they have a choice in types of assignments they may submit.

Students enjoy the hands-on activities that laptops make available; one student expresses her feelings about how boring class can become: “If the teacher’s just talking and it’s something that I already know or isn’t something that I’m interested in, it gives me a reason to look at other stuff, go on Google, search up something, work on other work.” When students enjoy the lesson, they are less likely to be distracted by online alternatives.
Other research notes that the lack of connection between testing and technology is a major problem for teachers who would love to make every class innovative and fun (Corn, Huff, Halstead, & Patel, 2011). Classes assessed by standardized tests are often perceived as more important than those that are not assessed with such tests (Siskin, 2003). Schoen & Fusarelli (2008) discuss how standardized assessment conflicts with the teaching and learning practices embedded in the 21st century skills movement. For example, the 21st century skills movement focuses more on collaborative, interdisciplinary authentic activities rather than isolated learning and assessment (Schoen & Fusarelli, 2008). English IV teachers have more free reign with technology than other teachers because their students are not tested through a standardized assessment.

Excellent tools such as FIZZ have been developed based on this concept of providing content to the student outside of class and providing discussion and the opportunity to dive deeper into material during class. FIZZ allows teachers to post classroom videos on a YouTube-like site so that students may repeatedly view the videos when studying (Barnhill, 2009). Another scholar encourages recording lectures and using class time to delve into deeper content/discussion/activity. Pecansky-Brock (2011) finds VoiceThread, an online tool which transforms media into a collaborative space through video, voice, and text commenting features, helpful for aligning classes to 21st century learning. These ideas are excellent ways to maintain students’ attention. Because students code certain activities as hot (such as social learning in which students connect) and some as cold (being lectured to, completing dull assignments that are simply “busy work”) (see Metcalfe & Mischel, 1999), tools such as FIZZ and VoiceThread are useful for helping students avoid distraction in 1:1
classrooms. Twenty-first century learners have myriad experiences using technology, and teachers would be wise to take advantage of the cultural technology knowledge base shared by many students (what Labbo & Place call technology funds of knowledge) (2010). This includes utilizing their love of social networking in the classroom and creating games about essential content.

**Manage Distraction by Incorporating Challenging Assignments**

Students comment on the need for assignments to be meaningful if they are to avoid online distractions. Students assert that they may seek other tasks when the teacher lectures for a long time: “If it’s an important kind of thing that we’re doing on the laptop, I focus only on that. But if it’s something like classwork that doesn’t really have to be due or isn’t for a grade then I won’t really concentrate on it.” This sentiment is especially true if the teacher grades the assignment only for “participation” rather than an actual letter grade. Students also note that some teachers help them to work on challenging assignments by allowing them to listen to music while they work. These students feel that they can stay focused on difficult material for a longer stretch of time when they listen to music; one traditional student notes, “With music in my ear I can keep working longer.” He finds that music keeps him on task and helps him to persevere through a challenging or time-intensive assignment. The literature supports this desire for challenging work. Not only does challenging works benefit students academically; it also benefits them by keeping them focused for longer periods of time (Donham, 2011).

If a teacher designs assignments that challenge, engage, and motivate the student, he or she may see a class transformed by a key concept regarding distraction and technology.
Teachers in this sample enjoy creating assignments which challenge students and lead them into higher level thinking activities than a simple Google search could provide. One teacher states, “I want to challenge them... It should be frustrating a little bit. It should cause a little problem. It should encourage them to think.” Relatedly, teachers emphasize the need to remember that the laptop is a tool, and the potential of the tool is only realized when students and teachers desire to learn and work hard to demonstrate their mastery of concepts.

**Manage Distraction by Promoting Self-Regulation, Self-Discipline**

Although half of the students interviewed prefer to focus on one task when completing assignments on their laptops in class, 81% of the students admit that the Internet tempts them to do something non-instructional during class like check personal e-mail or social networking sites. This occurs most frequently when students are bored with the current assignment or when they have an idea about another assignment dawn on them in a moment of inspiration. As one student notes, “If I’m on my laptop and I think about English, ‘Oh I have a paper due for such and such,” I’ll start typing it.” Fried (2008) found that students who used laptops in a traditional lecture-style university class spent considerable time multitasking and received lower scores on recall tests taken after the lecture. Fried notes that laptops certainly have their place in a classroom specifically designed for their use, but the “unstructured use of laptops in lecture courses is a disadvantage” (2008, p. 912). Fried’s research supports the notion that when students pay more attention to the Internet than the lecture, assessment scores decrease; furthermore, this study’s outcomes reflect the multitasking myth.
The Multitasking Myth

A traditional teacher believes the laptops have taught students “how to multitask and still be effective.” This teacher believes that the skill of multitasking is one that needs more attention, particularly for males (see Chapter Two). In *Brain Rules for Baby*, Medina (2010) asserts that the best predictor of academic success is not IQ, but self-control. The human brain chooses relevant stimuli from other options, and executive function allows the brain to stay on task and avoid unproductive distractions. Students from this sample would agree with Medina; they feel that reminding themselves of future goals and considering the rewards and punishments involved with seeking outside distractions is the key to staying on task during class.

Ever since the first human found himself learning to survive on this earth, human beings have experienced the double-edged sword that is distraction. When that early human, for example, was reverently watching a beautiful sunset, he would not survive if he did not also hear a hungry lion approaching. Today, this might look like a student who is putting together a beautiful PowerPoint presentation in class who loses his focus when a student laughs loudly in the hallway. His attention shifts for a moment, and he must bring it back. We give continuous partial attention all the time, and it can be difficult to focus on one task for a long time (Jackson, 2008). In this sample, most students treat online distractions as rewards rather than as the loud laughter in the hallway that might distract a student for just a few seconds. Hembrooke & Gay (2003) find that students who keep their laptops closed during class have higher test scores on content taught during that class. They note, however, that the key factor for those who keep their laptops open during class is the length of
browsing time. A lengthy browsing time “appears to be the nemesis of the multitasker; if one is adroit at staccato-like browsing, processing multiple inputs simultaneously may not suffer to the same extent” (Hembrooke & Gay, 2003, p. 59). Some students in the sample describe their browsing style this way. These students are able to treat distractions like the aforementioned loud laughter in the hallway; they visit an online dictionary, for example, and then quickly return to their assignment. They might have an idea for a science project, for example, while typing a discussion post in English; they quickly open a Microsoft Word document for science, type their idea, and return to their discussion post.

There are different types of multitasking; one type involves doing more than one thing at exactly the same time, such as driving and listening to the radio, or cooking dinner while talking to one’s spouse. The other type occurs when people rapidly change from one task to another; an example of this would be found in someone writing an essay for one class and then quickly reading Facebook messages. The first type is called parallel processing, and the second type is called task-switching (Gasser & Palfrey, 2009). Students in the sample are interviewed about the second type of multitasking: task-switching. As one student notes, “I’m almost always on my laptop messing around, whether it’s another class’s work or I’m just looking up some random stuff, but I still pay attention well enough to do all the work.”

Gasser & Palfrey (2009) find that the first type of multitasking (parallel processing) may increase efficiency, while the second type (task-switching) “can decrease efficiency, especially if those tasks demand more challenging cognitive processes” (p. 17).

Students and teachers must understand (and many already do) that parallel processing is a great skill to learn in school (e.g., let a file download while reading the day’s
assignment). Students should be advised that task-switching, however, can be hazardous to their mental health (Fried, 2008; Kraushaar & Novak, 2010). Teachers in the sample already do a great job of helping students to avoid task-switching through lessons that involve challenging assignments, strict deadlines, and engaging material that keeps students so engaged that they do not have enough time to become bored and seek online distractions. School administrators are also wise to have filters that block websites that typically distract students, such as Facebook and Twitter. There is some evidence that blocking this material at school helps students to better avoid this material outside of school (see Chapter 4).

The multitasking myth leads educators and students to utilize self-regulation when in class. Some students use self-regulatory techniques such as goal setting; they prefer focusing on specific tasks when completing assignments in order to meet the larger goal of passing the course, and eventually, graduation from high school. Students frequently mention talking to themselves to stay away from online distractions. They maybe be tempted, but avoid the distraction by encouraging themselves and literally telling themselves to get to work. One honors student notes, “I have to force myself and have learned that you’ve got to get your work done now and it’s just something that you’ve got to do within yourself. Like, say, OK, ‘You’ve got to get your work done’ so go ahead and stay focused.” Students in other 1:1 initiatives have accentuated the self-discipline necessary to avoid online distractions (Mathiasen, 2004). This idea of self-talk is supported in other literature and is connected with positive affect regardless of a student’s understanding of or experience of a classroom experience (Oliver, Markland, & Hardy, 2010).

Another idea that emerges from the analysis is that of teaching students not only
information and literacy skills, but also how to self-regulate when it comes to online
distractions. Teachers report that altering the assessment style from paper and pencil tests to
ExamView, an electronic testing system, helped one student because the software only
presented her with one question at a time, thus helping her focus better (Corn, 2009).
Differentiated assessment practices may become the norm as their advantages become
apparent over time.

One honors student describes feelings about researching online: “I’ll get distracted on
one site trying to research something, and sometimes I think of something else I have to do
and switch over to that. Sometimes I get lost.” This comment supports the notion that human
beings are beginning to absorb information quickly and in small pieces, often paying
attention to the irrelevant information that is so readily available rather than the information
one is actually seeking. The student in this sample refers to the way she easily gets “lost”
when researching online. Carr (2010) asserts that the activity of allowing one’s mind to focus
on irrelevant information rather than that which is meaningful and relevant signals “a
reversal of the early trajectory of civilization: We are evolving from cultivators of personal
knowledge into hunters and gatherers in the electronic data forest” (p. 2). Researchers,
educators, and policy makers must consider what exactly is lost when students are not taught
skills to help them manage online distractions.

**Teachers and Students are Developing Ways to Manage Distraction**

This study reveals numerous methods that teachers and students use to manage
distraction. I received intriguing responses during interviews, and the methods teachers use
are as nuanced as the individuals themselves. The literature cites various methods used to
help students avoid distraction in high-tech learning environments (Johnson, 2010), including: classroom response systems (clickers) and music (Cole, 2010; Johnson, 2010); setting ground rules at the beginning of the semester for wireless use, including a once-per-class period “no laptop time” (Wireless in the Classroom: Advice for Faculty, 2011); and using monitoring software which involves a range of benefits and drawbacks (Corn, 2009; Robinson, Brown, & Green, 2007). Teachers in this sample made use of each method except for classroom response systems and monitoring software (although the sample school does utilize school wide filters for certain websites). Some teachers prefer having an open and shut laptop time, which involves students opening laptops when the assignment calls for technology, and closing them when the assignment is over. Teachers also express the need to engage students so strongly in the lesson that they have no time to get distracted. Other methods include having strict deadlines/drop box dates for assignments and using a system in class that provides other activities for students to work on if they complete the main assignment.

Reading and Writing Online…The Good, the Bad, and the Ugly

When it comes to academic reading, interview data reveal that students typically prefer printed text rather than online text. The primary reason for this preference is that reading printed text does not provide as many distraction options as reading online text. Students enjoy the tactile experience of holding a book. One traditional student notes that with printed text, he can read and put his finger on the page as he moves from sentence to sentence. Like other students, he ascribes his preference for print to his past experience: “It’s something I’m used to doing since we first started reading.” Coiro and Dobler (2007) suggest
that online reading could be more complex due to three key skills it requires: (1) prior knowledge sources, (2) inferential reasoning strategies, and (3) self-regulated reading processes. Teachers note that preferences toward online reading are likely to reflect students’ literacy skills and cultural background; one traditional teacher, for example, notes that Hispanic students tend to prefer online reading and are particularly fond of creating online presentations rather than standing up to present in front of the class. Teachers note that although most students prefer reading printed text, some students prefer electronic or online text because they can use it more efficiently for their own needs; for example, they can highlight text, electronically write on the document, and copy and paste pieces of text to their own documents.

Research suggests that there are more memory benefits to writing by hand than with typing (Longcamp et al., 2006). Haynes (1996) finds that middle school students identified as inhibited writers discover benefits when writing with laptops; they maintain more positive attitudes toward writing, decrease the number of errors in grammar and style, and write longer passages. At-risk students in particular experience benefits from using multimodal texts. McKenna (1998) notes the transformation that “talking books” can provide which help associate students' listening and viewing with their comprehension of print. Teachers and students from this sample do not report using one of the newer methods of classroom writing, which occurs through open source software such as Google Docs. This can be a great location for their written work, as it can lead to an attractive online portfolio where brainstorming, peer editing, revision, and teacher feedback can all take place and be documented over the course of the semester (Pahomov, 2011). This type of writing can be
greatly beneficial for schools in which each student has a Google account, as this allows them to save work in one place and be able to reference their portfolio upon graduation.

Activities such as these are great ways to demonstrate 21st century skills and help students engage with New Literacies, a term that encapsulates the skill of using the Internet and other ICTs to identify important questions, locate information, critically evaluate and synthesize that information, and then communicate the answers to others (Leu et al., 2004).

**Manage Distraction by Illustrating the Relevance of Technology**

Teachers and students recognize that the world is much flatter now that most of its inhabitants are connected through the World Wide Web (Friedman, 2005). Learning 21st century skills such as life and career skills, learning and innovation skills, and information, media, and technology skills while in a 1:1 environment will help them as they compete in a global economy in the future. Teachers mention a need to prepare students for a global workforce. One teacher constantly reminds students that they are not only competing with their classmates, but with peers around the world. Glimps (2008) recognizes the need for American schools to better prepare children with physical and health disabilities for a globalized workplace. She points out the need for students to learn about a global world. This may be done particularly through social studies courses, which have traditionally taught a blend of disciplines, including geography, civics, history, and anthropology. Glimps recommends adding more comparative religion and foreign language courses to the curriculum to aid with the 21st century concern of globalization, which aligns with two NETS*S components: Communication/ Collaboration and Digital Citizenship.

Students believe that being involved in a 1:1 initiative is extremely useful for their
future college and career goals, and staying in touch with the relevance of high-tech learning plays a role in their distraction management. Students recognize that they are in a unique and fortunate position by attending a school that is a recipient of the IMPACT grant. One AP/honors student remarks, “My uncle’s a teacher and he still uses chalkboards and he was asking my mom for overhead sheets one day and she’s like, ‘We got rid of those ten years ago.’” One traditional student can see how becoming tech-savvy will help her in future endeavors: “You can even go to a gas station and you have to punch it in on a computer so it’s going to help because it’s gradually moving me forward to the future…but as far as distraction goes, yes, it can be a big distraction.” This student expresses the typical opinion about technology and distraction, which communicates a need to learn how to effectively utilize technology while discovering ways to manage the many electronic distractions that are available through high-tech machinery and the World Wide Web.

**Critical Thinking and NETS**

Particular conclusions lend themselves to further discussion, as they help to extend other research. One in particular involves teacher concerns about the lack of critical thinking that sometimes occurs when students have 24-7 access to technology. Teachers want students to use the technology but to also have the foundational knowledge that is required to advance through the levels of Bloom’s taxonomy. One teacher notes, “You know it starts at the bottom, but there are these other things way up here, and I want them to be able to evaluate, think about consequences, think about decisions.” This idea of evaluating different sources and considering outcomes is one of the key standards found within the National Educational technology Standards. Typically curriculum is greatly impacted by assessment practices, but
when the NETS*S are implemented, they often impact curriculum. An education that meets
the NETS helps to focus the curriculum on the child’s experience rather than on fractionized
facts (Dewey, 1902). Information, media, and technology skills represent the area of
information and media literacy expertise and comprise a key part of the Framework for 21st
Century Learning. Students enter high school with a range of technology skills; some may
not have much experience with technology or typing if they do not have a computer at home.
Having access to technology helps students develop 21st century skills and meet the NETS
through the way they are assessed.

Twenty-first century skills are not new for American educators, but they must be
taught in a more deliberate manner than in the past. Content must not be shortchanged in the
effort to attain a new skill set (Rotherham & Willingham, 2010). Online course enrollments
are one way to make teaching 21st century skills more deliberate. One student comments on
the benefits gained through his online class, such as gaining the opportunity to explore new
languages such as Arabic; he also notes how he enjoys when teachers video chat with others
across the state and entire world. As students enter the world of online learning, they must
have self-directional skills in order to succeed. There is some concern over students with
discipline problems in the traditional classroom taking online courses as a last resort, but in
general, teachers have a positive regard for online learning (Oliver, Brady, Patel, &
Townsend, 2009). Virtual learning provides ways for students to have access to a wider range
of subjects and college-level courses than the traditional classroom. Students agree that
online learning teaches them learning and innovation skills, technology literacy, and
information literacy (Oliver et al., 2009). By having 24/7 access to information, some
students are finding that what seemed impossible before, such as higher education, career potential, and a lifelong love of learning, is now within their reach.

By providing access to new technologies such as laptops, schools are beginning to bridge the digital divide. One could argue that the NETS*S have facilitated the process of bridging the digital divide in schools (see Whitcraft & Ibanga, 2007). Because of national standards regarding technology, numerous public and private enterprises have provided funds to increase the amount of instructional technology found in low-income school districts. The NETS*S have helped to spur teachers away from drill and practice activities and toward higher level learning that includes a connection to the skills of information, technology, and civic literacy (Partnership for 21st Century Skills, 2003).

The NETS*S will undoubtedly be altered as technology becomes a more salient part of students’ and teachers’ lives. The primary improvement suggestion for NETS*S has been foreshadowed above: refine practice to enliven theory. Teachers and administrators experience the need to fine-tune their modes of facilitating learning so that students are prepared for the workforce they will enter. Educators must ensure that inquiry and problem-based learning—not technology—guide students’ learning tasks (Porter, 2010).

**Theoretical Considerations**

I began this study with the hypothesis that student distraction management in a 1:1 environment is based heavily on student self-regulation skills. Although the methods teachers use can lead students to manage distraction in a more positive or negative way, it is the self-regulatory skills of the students which make the most difference in their mastery of distraction avoidance. Self-regulation is the way in which one exerts control over his or her
own responses to pursue goals and live up to standards (Baumeister & Vohs, 2004). It is clear from the data collected within this study that students’ self-regulatory techniques determine how they manage electronic and online distractions. Students make explicit use of self-regulatory tools such as monitoring, planning, evaluating, and implementing goal-directed behavior (Karoly, 1999). Analyses reveal self-regulation theory in action. Students utilize techniques such as keeping long-term goals (such as graduation) in mind when they are tempted to veer away from the assignment, positive self-talk, listening to music, and taking breaks (both mental and physical). These actions demonstrate a strong set of self-regulatory skills, particularly for students who have been involved in a 1:1 initiative for less than three years.

The researcher’s initial presumption regarding Posner’s theory (Posner & Boies, 1971) of attention appear to hold true, and are especially illuminated by the teachers’ methods of managing student distraction. Teachers are especially adept at orienting students’ attention away from potential distractions and directing them toward the topic of the day. This is done through assignments that clearly define expectations and have a strict deadline. Because students know they will lose points if their work is late, they are adamant about finishing work before the deadline. Teachers note that students are also more likely to work hard in class if they think they can complete everything and avoid having homework. Observation data reveals that teachers make use of technology to orient attention; video and presentations that include more photos than text are just two ways in which teachers orient students’ attention. Findings from this study also point to the alerting piece of Posner’s theory, which is the part related to wakefulness and can help students stay on task. This
occurs when students realize how important an assignment is, and ties in to the goal setting involved with self-regulation theory, is also expressed through teacher and student distraction management methods. Students pay heightened attention, for example, when they know that an assignment is part of the larger graduation project. If students do not complete this project, they do not graduate; this highly important outcome alerts students to get motivated and avoid that which may hinder their ability to achieve their goal. Finally, results point toward the executive network, which relates to the issue of which responses are selected. Executive attention is connected to disorders related to addiction and antisocial behaviors; further, Posner asserts that it is executive attention that seems to be impaired in many forms of mental illness including Alzheimer's disease and schizophrenia. There is a point at which students must exercise agency and decide if avoiding distraction is better for them than avoiding their assignment. Just as these students must use each facet of their attention to avoid distraction, so must all users of high-tech, fast-paced machines apply their attention in a wise manner if they are to achieve their goals.

**Implications**

One to one learning can provide excellent outcomes for students, teachers, and administrators if it is implemented successfully. As Chapter Two communicates, factors that lead to the successful implementation of a technology initiative include support systems such as learning environments, professional development, and curriculum design (Partnership for 21st Century Skills, 2003). A 1:1 initiative can have positive effects on communities and especially on students (Bebell, 2005; Great Maine Schools Project, 2004). Classroom teachers report benefits of 1:1 learning such as improved technology knowledge and skills,
increased assistance with technology questions and problems, and improved classroom management (Fairman, 2004).

This study illustrates how 1:1 learning can help students prepare for the myriad distractions that are available to them in college and beyond through five major themes. Data supports the first theme, “Manage distraction by incorporating project that students enjoy,” through reminders from students to make learning hands-on and reflective of the 21st century skills. They enjoy it when teachers utilize new technologies for class, even if the teacher needs help from students to make the technology work correctly. Data supports the second theme, “Manage distraction by incorporating challenging assignments through student suggestions to capitalize on their love of socializing through assignments. They enjoy collaborating on documents using open source software (such as Google Docs) and would appreciate more problem-solving activities to be completed in groups. Data supports the third theme, “Manage distraction by promoting self-regulation, self-discipline,” through students’ admonitions to so thoroughly engage them in the lesson that they do not have a chance to seek outside stimulation. Teachers may also use classroom management techniques or implement self-regulatory discussions to keep students focused. Data supports the fourth theme, “Teachers and students are developing ways to manage distraction,” through teachers’ suggestions to create rigorous assignments, enforce strict deadlines, and utilize the online grading feature. Finally, data supports the fifth theme, “Manage distraction by illustrating the relevance of technology,” by communicating with students about the importance of learning 21st century skills at this point in history. Students tend to respond better to distractions when their teacher helps them understand how relevant technology literacy is to their personal and
professional success. It is the researcher’s hope that educators, researchers, and policy makers will take the lessons learned from this study to heart (see Table 5.1).

Table 5.1

*Themes and lessons learned.*

<table>
<thead>
<tr>
<th>Theme</th>
<th>Lessons Learned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manage Distraction by Incorporating Projects that Students Enjoy</td>
<td>Make learning hands-on; utilize new technologies for class. By personalizing assignments, students instantly become more interested and engaged.</td>
</tr>
<tr>
<td>Manage Distraction by Incorporating Challenging Assignments</td>
<td>Use students’ love of socializing to your advantage; have them collaborate on documents or complete problem-solving activities as a group.</td>
</tr>
<tr>
<td>Manage Distraction by Promoting Self-Regulation, Self-Discipline</td>
<td>While filters and monitoring software can aid distraction, the best way to keep your students focused is to engage them. Have an open discussion with students about how you define online distraction; recognize that minimizing windows or viewing outside resources might be aiding student learning rather than hindering it. Consider allowing students to listen to music while working on individual assignments and discussing self-regulatory techniques with them, along with why these skills are important for the future.</td>
</tr>
<tr>
<td>Teachers and Students are Developing Ways to Manage Distraction</td>
<td>Make work challenging; use deadlines to your advantage; utilize the online grading feature available in most course management systems (such as Angel, Moodle, or Blackboard).</td>
</tr>
<tr>
<td>Manage Distraction by Illustrating the Relevance of Technology</td>
<td>Understand that you are teaching during a pivotal moment in history; learning is changing and continuous professional development and the courage to try new teaching methods is imperative.</td>
</tr>
</tbody>
</table>
Limitations

Because qualitative research is not value neutral, it can be difficult for the researcher to separate personal bias opinions from the data (Creswell, 2007; Merriam, 1998). As the primary instrument of data collection, the researcher had to maintain a constant awareness of her own perceptions and beliefs throughout the research study (Merriam, 1998). Readers must also be aware that the data is self-reported and there is no comparison group; further, due to the small sample size, descriptive data from classroom observations may appear inflated. Because interview data constitutes the primary data source for this study, participants could have responded in a less truthful way fearing punishment. Limitations also include a lack of generalizability due to all participants being from North Carolina high schools.

Upon corresponding with a technology facilitator (TF) at each school, a handout was disbursed explaining the study to teachers. After obtaining teacher e-mail addresses from the TF, teachers chose four students from their classes to be interviewed. Teachers selected students based on how successfully the student maintains attention on appropriate task, regardless of input modality (visual, auditory) or type of task (Posner, 1986) and whether the student successfully manages cognitive interference (Fried, 2008). Although this was intentional about including classrooms exhibiting a range of group-based, self-directed, and teacher-led activities, one day’s observation had to be rescheduled due to a school play; thus, some of these activities were observed within some classrooms and not in others.
Recommendations for Future Research

These preliminary findings reflect the research possibilities involving distraction in high-tech classroom settings. Could young students grow up to possess greater self-control due to 1:1 learning and the practice of avoiding copious sources of distraction found online? Future research could explore different grade levels in a longitudinal study because research suggests that although self-control generally improves with age, it tends to be a stable factor throughout one’s lifetime (Mischel et al., 1988). It would be intriguing, for example, to have interviewed these students about distraction management in their elementary years. Along the same lines, one could conduct a similar study with only students who have poor attention skills in class, or only those who have strong attention skills. Furthermore, one could create an observation protocol or survey for measuring distraction in high-tech environments and obtaining longitudinal measures. More research is also needed in the area of student focus when reading online text versus reading printed text, as student answers may differ from this sample if they use online textbooks or e-books such as the Nook, Kindle, and iPad. More research is needed with regard to the online versus print reading involving the impact of literacy skills and cultural background. Scholars could explore the potential connection between grades and distraction management styles. One might examine the role of music in distraction management, with a focus on what types of music students prefer to help them focus. Because AP/honors teachers are more concerned about technology’s impact on the mind and society in general, scholars might examine how perceptions of AP/honors and traditional teachers affect technology implementation. Future research could include a study similar to this one which includes lower grade levels rather than seniors who do not have the
push of high school graduation urging them toward task completion. Finally, scholars may pursue how administrators determine which sites they should block through school wide filters.

Conclusions

After examining the impact of 1:1 learning on distraction management, it is safe to assume that integrating this type of technology requires scholarly pursuit. Many would argue that laptop initiatives’ positive effects outweigh the negative drawbacks (Fried, 2008). Key features of 1:1 initiatives such as teaching, learning, and assessment are particularly unavoidable topics when undertaking the study of laptop initiatives. The study of technology’s impact on American students is imperative, particularly in a world where digital media encourages multitasking and includes “seeking, sieving, and synthesizing, rather than on assimilating a single ‘validated’ source of knowledge as from books, television, or a professor lecturing” (Dede, 2005, p. 4-5).

So what about IMPACT? The IMPACT project is alive and well; in fact, in the fall of 2011, twelve NC schools were recipients of the grant. This means that school and district leaders will receive IMPACT Model implementation training, coaching services, and graduate-level coursework. Eligibility for these grants was determined by federal criteria of high poverty and high technology need (Public Forum of NC, 2011).

As educators look toward the future of 1:1 learning and the many distractions that will be available to students simultaneously, they must learn to utilize data-based distraction methods in their classrooms. The study helps to move this area of inquiry forward by gaining a thorough understanding of strategies students and teachers use to manage distraction in 21st
century classrooms. By entering a school system that has been provided with high-tech classrooms, informed leadership, and appropriate professional development, this study expands the field of instructional technology and increases the effectiveness of teachers and students so they may excel in school. By employing the techniques that teachers and students say work best for avoiding distractions, teachers can hypothetically prepare students for a lifetime of uninterrupted learning.
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APPENDICES
APPENDICES

APPENDIX A

INFORMED CONSENT FORM FOR RESEARCH (PARENT/STUDENT)

Title of Study: Student Distraction in a 1:1 Learning Environment
Principal Investigator: Jennifer Tingen Tagsold
Faculty Sponsor: Lori Holcomb

What are some general things you should know about research studies?
You are being asked to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate or to stop participating at any time without penalty. The purpose of research studies is to gain a better understanding of distraction in a 1:1 environment. You are not guaranteed any personal benefits from being in a study. Research studies also may pose risks to those that participate. In this consent form you will find specific details about the research in which you are being asked to participate. If you do not understand something in this form it is your right to ask the researcher for clarification or more information. A copy of this consent form will be provided to you. If at any time you have questions about your participation, do not hesitate to contact the researcher(s) named above.

What is the purpose of this study?
The purpose of this study will be to explore strategies used by students and teachers to manage student distraction in a 1:1 environment.

What will happen if you take part in the study?
If you agree to participate in this study, you will be asked to

- Participate in an interview at your high school for the duration of 30-45 minutes. Based on the selection process and student availability, there will only be four students from each class who will be asked to participate in the interviews. Teachers will be selecting four students from their class who will be interviewed for this study; because four teachers will be participating, that equals a total of 16 twelfth grade students from your school. If you would like your child to be considered for the interview, please provide your consent for their participation.
- This interview will take place once during the semester; during this interview, you will be asked about strategies you use to manage distraction in class when using a laptop. Interviews will be completed in a separate room with only the researcher and the interviewee present. The interviews will be recorded and later transcribed. The researcher will also observe your class, so the interviews may be completed before or after these observations depending on the class schedule for that day. In order to find a quiet and private place to hold the interviews, you may be taken out of class to participate in the interview. When you return and will be expected to communicate with the teacher about missed work. Interviews will be recorded and later transcribed.
• Participate in a class which will be observed, during which no interaction with the researcher will occur.

Risks
No foreseeable risks or discomforts are expected from your participation in this study. The teacher will not see individual responses to interview questions, which should allow for truthful answers.

Benefits
Findings from this will be to identify the strategies used by students and teachers to avoid distraction in a high-tech environment. By identifying best practices, professional development activities and tools can be developed to further support teaching and learning in technology-rich educational environments.

Confidentiality
The information in the study records will be kept confidential to the full extent allowed by law. Interview and observation data will be coded and stored securely in password-protected Web forms. A MasterList will be used to code student interviews along with audio transcripts/recordings. This MasterList will be kept confidential and will be stored in an encrypted Microsoft Word file on the researcher’s personal computer. After transcripts of interviews are created, audio recordings will be destroyed. No reference will be made in oral or written reports which could link you to the study. You will NOT be asked to write your name on any study materials so that no one can match your identity to the answers that you provide. The report will include themes derived from coding the interviews and classroom observations; individual quotations will be used with no reference to individual names or other identifiers. Student interviews will be coded by number and letter according to the order in which they were interviewed. Any identifying language will be removed from direct quotations. Although no identifiers will be used in reports it may be reasonable that the participants are identified since there is only a small number of participants being used in this study (4 teachers and 4 students from each of the teachers classes).

Compensation
Incentives for participation include entrance in a drawing to win a $25 Amazon gift card. All 16 students who agreed to be interviewed will be entered, but only one student will win.

What if you have questions about this study?
If you have questions at any time about the study or the procedures, you may contact the researcher, Jennifer Tagsold, at jktingen@ncsu.edu or 919-513-8553.

What if you have questions about your rights as a research participant?
If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Deb Paxton, Regulatory Compliance Administrator, Box 7514, NCSU Campus (919/515-4514).
Consent To Participate

“I have read and understand the above information. I have received a copy of this form. I agree to participate in this study with the understanding that I may choose not to participate or to stop participating at any time without penalty or loss of benefits to which I am otherwise entitled.”

Subject's signature ____________________________ Date ________________
Parent’s signature ___________________________ Date ________________
Investigator's signature ______________________ Date ________________
APPENDIX B
INFORMED CONSENT FORM FOR RESEARCH (TEACHER)

Title of Study: Student Distraction in a 1:1 Learning Environment
Principal Investigator: Jennifer Tingen Tagsold
Faculty Sponsor: Lori Holcomb

What are some general things you should know about research studies?
You are being asked to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate or to stop participating at any time without penalty. The purpose of research studies is to gain a better understanding of distraction in a 1:1 environment. You are not guaranteed any personal benefits from being in a study. Research studies also may pose risks to those that participate. In this consent form you will find specific details about the research in which you are being asked to participate. If you do not understand something in this form it is your right to ask the researcher for clarification or more information. A copy of this consent form will be provided to you. If at any time you have questions about your participation, do not hesitate to contact the researcher(s) named above.

What is the purpose of this study?
The purpose of this study will be to explore strategies used by students and teachers to manage student distraction in a 1:1 environment.

What will happen if you take part in the study?
If you agree to participate in this study, you will be asked to

- Participate in an interview at your high school for the duration of 30-45 minutes. This interview will take place twice during the semester; during this interview, you will be asked about strategies you use to manage distraction in class when students are using a laptop. Interviews will be completed in a separate room with only the researcher and the interviewee present. These may be completed before or after the observation depending on the class schedule for that day. There will be a total of four teachers interviewed at your school. Each teacher will select four students from his or her class to be interviewed based on distraction management strategies. Students may be taken out of class to participate in the interview and will be expected to communicate with you about missed work. Interviews will be recorded and later transcribed.
- Distribute and collect student consent forms.
- Participate in classroom observations, allowing the researcher to enter and observe your class twice for an estimated time of 30 minutes per observation. During the observation, there will be no interaction with the researcher.

Risks
No foreseeable risks or discomforts are expected from your participation in this study.
Benefits
Findings from this will be to identify the strategies used by students and teachers to avoid
distraction in a high-tech environment. By identifying best practices, professional
development activities and tools can be developed to further support teaching and learning in
technology-rich educational environments.

Confidentiality
The information in the study records will be kept confidential to the full extent allowed by
law. Interview and observation data will be stored securely in password-protected Web
forms. After transcripts of interviews are created, audio recordings will be destroyed.
Interview and classroom observation data will be coded and no data will be identifiable by
your name. No reference will be made in oral or written reports which could link you to the
study. You will NOT be asked to write your name on any study materials so that no one can
match your identity to the answers that you provide. A MasterList will be used to code
teacher interviews along with audio transcripts/recordings. This MasterList will be kept
confidential and will be stored in an encrypted Microsoft Word file on the researcher’s
personal computer. Although no identifiers will be used in reports it may be reasonable that
the participants are identified since there is only a small number of participants being used in
this study (4 teachers and 4 students from each of the teachers classes).

Compensation
Incentives for teacher participation include one $25 Amazon gift card per teacher. Incentives
for students include entrance into a drawing with a chance to win a $25 gift card. Winners
will include one student and every teacher who participated in the study by agreeing to be
interviewed. Students must have completed one interview to win, and teachers must have
completed both the first interview and the debriefing interview.

What if you have questions about this study?
If you have questions at any time about the study or the procedures, you may contact the
researcher, Jennifer Tagsold, at jktingen@ncsu.edu or 919-513-8553.
What if you have questions about your rights as a research participant?
If you feel you have not been treated according to the descriptions in this form, or your
rights as a participant in research have been violated during the course of this project, you
may contact Deb Paxton, Regulatory Compliance Administrator, Box 7514, NCSU Campus
(919/515-4514).

Consent To Participate
“I have read and understand the above information. I have received a copy of this form. I
agree to participate in this study with the understanding that I may choose not to participate
or to stop participating at any time without penalty or loss of benefits to which I am
otherwise entitled.”

Subject's signature______________________________ Date _________________
Investigator's signature___________________________ Date _________________
APPENDIX C
INTERVIEW PROTOCOL FOR STUDENTS

Date/Time/Location:

Measuring Distraction Level
1. How often do you focus on just one task when you use the laptop in class? (e.g., Do you go directly to the site you need to visit?)
2. Does the Internet tempt you to do something non-instructional during class, like check personal e-mail or social networking sites? Explain.
3. When using computers in class, do you ever minimize windows quickly or try to hide what you are doing when the teacher walks by?
4. Do you focus better when reading online or when reading printed text like a book or magazine? Why?

Strategies for Managing Distraction
5. How do you deal with online distractions at school?
6. What is your process for completing an assignment on your laptop? For example, once you are sitting at your computer, do you use any special techniques to stay focused?
7. Does learning to avoid online distractions at school affect how well you avoid distractions outside of school? Explain.
8. Would you say that using the laptop has helped you learn to deal with distraction? Explain.
APPENDIX D
INTERVIEW PROTOCOL FOR TEACHERS

Date/Time/Location:

Measuring Distraction Level
9. How often do your students focus on just one task when they use the laptop in class?
   (e.g., Do they go directly to the site they need to visit?)
10. Does the Internet tempt students to do something non-instructional during class, like
    check personal e-mail or social networking sites? Explain.
11. When using computers in class, do students ever minimize windows quickly or try to
    hide what they are doing when you walk by?
12. Do students focus better when reading online or when reading printed text like a book
    or magazine? Why?

Strategies for Managing Distraction
13. How do you help students deal with online distractions at school?
14. What process do students use to complete assignments on their laptops? For example,
    once they are sitting at the computer, do they use any special techniques to stay
    focused?
15. Does learning to avoid online distractions at school affect how well your students
    avoid distractions outside of school? Explain.
16. Would you say that using the laptops has helped your students learn to deal with
    distraction? Explain.
APPENDIX E
LoFTI OBSERVATION TOOL

Purpose: LoFTI is a tool to aid in the observation of technology integration into teaching and learning. The data gathered through the use of this instrument should be helpful in building-level staff members as they plan and/or provide professional development in instructional technology.

For all items, check any and all which apply to the activities being observed.

<table>
<thead>
<tr>
<th>Month</th>
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<tbody>
<tr>
<td>Date</td>
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<td>Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AM/PM</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Observer Name

Which school is being observed?

Teacher Name

Grade Level

What track is this class?
- Special Education
- Remedial
- General Education
- Honors
- Advanced Placement
- Other (please specify)

Is technology in use?
- Yes
- No

How many students are...
in class?
using technology

Student Arrangement
- Tables, Centers, Pods
- Circle or U
Learning Environment
- Auditorium
- Media Center
- Conference
- Multi-purpose room
- OBS
- Outside
- Gymnasium
- Virtual Environment
- Other (please specify)

Student Grouping
- Independent work
- Small groups
- Learning centers
- Whole group
- Pairs
- Workshops
- Other (please specify)

Instructional Collaborators
- Administrator
- Special Ed Teacher
- Assistant
- Student
- Curriculum Specialist
- Technology Facilitator
- Media Coordinator
- Volunteer
- Other Teacher
- None
- Outside Consultant
- Other (please specify)

Course Subject
- Arts
- Physical Education
- Career Technical
- Library/Media Skills
- Computer/Technology Skills
- Mathematics
- English/Language Arts
- Foreign Languages
- English as a Second Language
- Science
- Guidance
- Social Studies
- Health
- Other (please specify)

Teacher Activities
- Activating prior knowledge
- Providing feedback
- Assessment
- Questioning
- Class, questions, and advance organizers
- Reinforcing/remembering
- Demonstration
- Scaffolding
- Differentiated instruction
- Setting objectives
- Facilitation (guiding)
- Summarizing
- Lecture
- Other (please specify)

Assessment Methods
### Technology is being used as a tool for...
(Check either Teacher or Student, or both)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Teacher</th>
<th>Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem-Solving (e.g., graphing, decision support, design)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Communication (e.g., document preparation, email, presentation, web development)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Information Processing (e.g., data manipulation, writing, data tables)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Research (e.g., collecting information or data)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Personal Development (e.g., e-learning, time management, calendar)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Group Productivity/Cooperative Learning (e.g., collaboration, planning, document sharing)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Formative Assessment</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Summative Assessment</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Brainstorming</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Computer-assisted instruction</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Face to face classroom discussion</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Face to face group discussion</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Asynchronous discussion</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Drill and practice</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Generating and testing hypotheses</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Identifying similarities and differences</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Project-based activities</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Rhetoric</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Summarizing and note-taking</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

### Technology/hardware is in use by...
(Check either Teacher or Student, or both)

<table>
<thead>
<tr>
<th>Technology/hardware</th>
<th>Teacher</th>
<th>Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assistive Technology</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Audio (e.g., speakers, microphone)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Art/Music (e.g., drawing tablet, musical keyboard)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Imaging (e.g., camera, film or digital camera, document camera, scanner)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Display (e.g., digital projector, digital white board, television, TV-link, printer)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Media Storage / Retrieval (e.g., print material, DVD, VCR, external storage devices)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Math / Science / Technical (e.g., GPS, probeware, calculator, video microscopes)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Desktop computer</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Laptop computer (including tablets)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

### Technology software in use by...
(Check either Teacher or Student, or both)

<table>
<thead>
<tr>
<th>Technology software</th>
<th>Teacher</th>
<th>Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative (e.g., grading, record-keeping)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Assessment / Testing</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Assistive (e.g., screen reader)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Computer-Assisted Instruction / Integrated Learning System</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Thinking tools (e.g., visual organizer, simulation, modeling, problem-solving)</td>
<td>Teacher</td>
<td>Student</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Hardware-Embedded (e.g., digital white board, GPS/GIS, digital interactive response systems)</td>
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<tr>
<td>Multimedia (e.g., viewing digital videos, digital video editing)</td>
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<tr>
<td>Productivity Software (e.g., database, presentation, spreadsheet, word processing)</td>
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<tr>
<td>Programming or web scripting (e.g., JavaScript, PHP, Visual Basic)</td>
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<tr>
<td>Graphic / Publishing (e.g., page layout, drawing/painting, CAD, photo editing, web publishing)</td>
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<tr>
<td>Subject-specific software</td>
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</tr>
<tr>
<td>Web Browser (e.g., MS Internet Explorer, Netscape, Firefox)</td>
<td></td>
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</tr>
<tr>
<td>Web Applications: Course management software (Cybrary, SchoolVue, EduPlatform, etc.)</td>
<td></td>
<td></td>
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<tr>
<td>Web Applications: Database systems</td>
<td></td>
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<tr>
<td>Web Applications: Discussion boards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Web Applications: Libraries, E-publications</td>
<td></td>
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<tr>
<td>Web Applications: Search engine</td>
<td></td>
<td></td>
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<tr>
<td>Web Applications: Video, voice, or real-time text conference</td>
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<tr>
<td>Web Applications: Web logs, blogs</td>
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<tr>
<td>Web Applications: Web mail</td>
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<tr>
<td>Web Applications: Wiki</td>
<td></td>
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<tr>
<td>NC-Specific Web Resources: Learn NC</td>
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<tr>
<td>NC-Specific Web Resources: NC Wise Owl</td>
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<tr>
<td>NC-Specific Web Resources: SAS in School</td>
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<tr>
<td>Other (please specify)</td>
<td></td>
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</tr>
</tbody>
</table>

For the following questions, please indicate the percentage of students in the classroom showing positive student engagement.

**Student engagement is shown by..**

<table>
<thead>
<tr>
<th></th>
<th>100%</th>
<th>80%</th>
<th>60%</th>
<th>40%</th>
<th>20%</th>
<th>0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustained behavioral involvement</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Student engagement is shown by..**

<table>
<thead>
<tr>
<th></th>
<th>100%</th>
<th>80%</th>
<th>60%</th>
<th>40%</th>
<th>20%</th>
<th>0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive emotional tone—cheerful, calm, communicative</td>
<td></td>
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</tbody>
</table>

**Click to write the question text**

<table>
<thead>
<tr>
<th></th>
<th>100%</th>
<th>80%</th>
<th>60%</th>
<th>40%</th>
<th>20%</th>
<th>0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erection of effort and concentration</td>
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</tr>
</tbody>
</table>
How essential was technology to the teaching and learning activities?
- No Technology
- Not needed, other approaches would be BETTER
- Somewhat useful, other approaches would be as EFFECTIVE
- Useful, other approaches would NOT BE AS EFFECTIVE
- Essential, the lesson could not be done without it

During each 3-minute period, was technology in use by students and/or teachers, and was the time spent with technology used for teaching and learning (as opposed to recreation or routine tasks such as boot-up and log-on)?

<table>
<thead>
<tr>
<th>Technology</th>
<th>00-03</th>
<th>03-06</th>
<th>06-09</th>
<th>09-12</th>
<th>12-15</th>
<th>15-18</th>
<th>18-21</th>
<th>21-24</th>
<th>24-27</th>
<th>27-30</th>
</tr>
</thead>
<tbody>
<tr>
<td>In use by students</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Used for learning</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>In use by teachers</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Used for learning</td>
<td>☐</td>
<td>☐</td>
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</tr>
</tbody>
</table>

Estimated time technology used

<table>
<thead>
<tr>
<th>Total Minutes used by students</th>
<th>Total Minutes used by teachers</th>
<th>Total Minutes used for learning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Class Agenda


Other Comments Regarding Teacher (e.g., demeanor, comfort with technology, interactions with students)


Other Comments Regarding Students (e.g., comfort with technology, peer interactions)


Other Comments Regarding Learning Environment
<table>
<thead>
<tr>
<th>Time Out</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AM/PM</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>