AN EXPLORATION OF THE READING STRATEGIES USED BY SIXTH GRADE
STUDENTS OF VARYING READING ABILITIES
WHEN READING INTERNET SOURCES TO ANSWER QUESTIONS

A DISSERTATION
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This current study explored the reading strategies that emerged through the case studies of five sixth-grade students as they read Internet websites. Data was collected from student surveys, field notes, and transcripts of three separate Internet sessions that required participants to think aloud about the reading process as they explored web sites to answer questions. Despite the varying reading abilities of the subjects, upper elementary children use traditional as well as additional reading strategies when they read online articles. Using grounded theory, four reading strategy themes emerged consistently from three different reading sessions: determining importance (DI), matching skills (MS), monitoring understanding (MU), and navigating (N). Through this study, the researcher hoped to provide another snapshot of how the typical students in the upper elementary might read Internet resources which would ultimately allow classroom teachers to focus on the development of those strategies.
Dedication

Without the support of my family, this dissertation would never have happened, and it is to them that I dedicate this work. I am married to a man who allows me to dream, and who encourages me to stretch myself emotionally and intellectually. For nearly twenty-four years, Brian has encouraged me to be a scholar and an educator. He consistently has supported my passion for teaching and he works hard to help me find ways to improve the field of education. I am especially grateful for the love and support of my children. For them, I began this adventure, believing I could be a good role model by demonstrating my ability to juggle a family, a career, and an advanced degree. More importantly, this dissertation is for my children to see that dreams can be achieved, and that pursuing one’s passion is important work. Elizabeth, with whom I will share the same year of graduation, and Lucas provided me with encouragement each time they responded to my requests for help around the house, each time they asked about my project, and each time they said, “You can do it, Mom!” Both were young children, a fifth grader and a first grader, when I began this journey, and they have grown up along the way; they have learned a great deal from watching me complete this project, and they remind me of that constantly. For my parents, Allan David White and Katherine Anne Mitchell Ackley, I am forever indebted for instilling in me a passion for learning and a desire to make a difference in this world. Their never ending list of academic projects taught me that working hard on a large endeavor is part of being human, for our works become part of us, and if that endeavor can offer something to the larger community, then it was worth the effort.
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Chapter I: Introduction

Context

Sixteen-year-old Elizabeth sits at the computer deeply engaged in three simultaneous Instant Messaging conversations. While listening to downloaded music on her iPod, she opens up a window on her computer and types a message to a friend using a variety of symbols and unconventional, often abbreviated spellings to which her friend will respond within seconds. Elizabeth might even open another window for Facebook to update her status or write on a friend’s “wall,” a virtual bulletin board where peers leave short, often cryptic, messages for one another. At times, she makes her way seamlessly and quickly from one screen to the next. In this middle-class American home, even Elizabeth’s twelve-year-old brother, Lucas, has discovered instant messaging and online games. He and many of his middle school peers have Facebook accounts where they track their basketball records or post pictures of birthday parties and summer baseball games. Frequently, this pre-teen also chats with friends through Instant Messenger or he interacts with peers in the cyber world of virtual reality games, such as Runescape and World of Warcraft. At an early age, he realized the difference between high-speed and dial-up Internet services and the effect each has on the quality of his online games. While only twenty-three percent of teens actually use multiple forms of media at the same time as Elizabeth does, ninety-percent of American teenagers do have access to the Internet (Nielsen, 2009). Parallel to their peers, Lucas and Elizabeth rely on the computer for social networking and for entertainment such as watching videos like those posted on YouTube (Kaiser Foundation, 2010). Equally as important to both adolescents, the Internet is Elizabeth’s and Lucas’ primary tool for completing homework.
assignments; just as eighty-four to ninety and eight-tenths percent of American teenagers, they first consult the Internet before any other source for homework (U.S. Census, 2005). Therefore, the Internet plays an integral part of their day.

The amount of time as well as the reason for using the Internet seems to vary for pre-teens and adolescents, but the Internet, along with other forms of technology, consumes quite a bit of time for these young people, and it has shaped their view on entertainment and communication. Thirty-three million American teens (Nielsen, 2009) interact daily with handheld gaming devices, cell phones, Internet pages, instant messaging, blogs, PowerPoint, and other rapidly changing technologies (Prensky, 2001; NCREL & Metiri, 2003; Nielsen, 2009). According to the 2009 Nielsen report, teenagers spend an average of eleven hours and thirty-two minutes each month on the Internet, a rather conservative number compared to the Kaiser Foundation report (2010) which logs use of the computer for adolescents to an hour and twenty-nine minutes every day, seven days a week. Add in the other forms of media American teenagers use each day, and the average time they spend is seven hours and thirty-eight minutes each day (Kaiser Foundation, 2010). These digital natives, a term first coined by Marc Prensky (2001) to identify the current generation born into a world filled with digital technology, have come of age in a time when tomorrow’s technology is often radically, but ironically also sometimes only gradually, different than today’s. As a result of the nature of the technologies with which they interact daily, these digital natives require instant gratification and prefer graphics over text, working best when networked with their peers (Prensky, 2001).
With the rapid changes in technology, today’s student often enters a school that no longer relies simply on paper, pencils, and textbooks. While this twenty-first century classroom may resemble the physical environments of her parents’ childhood classrooms, changes in technology have impacted the activities a student completes inside as well as outside the schoolhouse. To define the problem explored by this research project in the spring of 2010, nearly twenty years after the World Wide Web was introduced, this chapter examines the implications the Internet has had on Americans since the early 1990s. This chapter also outlines the research question and delineates the significance of exploring the reading strategies used by sixth-grade students of varying reading abilities. The researcher also reveals assumptions made about the study as well as the limitations of conducting this particular research project.

Having access to the Internet has brought with it important implications for children and adolescents. Since the introduction of the World Wide Web, 1,966,514,8216 people use the Internet (Internet World Stats: Usage and Population Statistics, n.d.) and eighty two-percent of American families currently have Internet services in their homes (USC Annenberg, 2010), a number that continues to grow. In fact, a large number of American families have more than two computers in their homes and nearly one hundred percent of Americans under the age of twenty-four use the Internet (USC Annenberg, 2010). Many children, then, enter school having had access to computers and the Internet, and others, like Lucas and Elizabeth, come to school quite versed in surfing the Internet as well as interacting with others through a variety of technological media, media that ask consumers to read in different venues. Because early in their lives they begin interacting with these different forms of technological media,
they develop a different set of skills than previously needed. Children may even think differently than adults who grew up in print-dominated environment (Bearne, 2003; Prensky, 2001).

The increasing popularity of computers at home and in the classroom has spurred researchers to examine the role of technology in children’s lives. Research initially focused on the impact the physical elements of the computer had on student motivation, such as the effects of screen displays on students’ learning (Maushak, Chen & Lau, 2001; Page, 2002; Yee, 2006). Until recently, though, few researchers have explored the impact the computer, especially when used to read Internet sources, has had on students’ abilities to read and understand text. Interestingly, Kamil and Lane (1998) indicated that technology’s influence on literacy “is the facet of technology and literacy research most likely to grow and indeed where growth is most needed” (p. 324). As outlined in contemporary reading research, the relationship between reading and the Internet has begun to interest researchers, but few have given it the attention it requires. The intention of this dissertation is to add to the research in this area of reading.

Researchers who first ventured into the domain of Internet reading suggested initial differences in the strategies students use when they read online texts and when they read traditional static texts; in fact, they suspected that these readers used additional strategies to read an Internet article (Coiro, J. & Dobler, 2007; Leu, D.J., Jr., Kinzer, C.K., Coiro, J., Cammack, D., 2004). Because it was easier to work with successful readers, many of the first studies in Internet reading strategies focused on readers who had developed the skills of reading to the point of comprehension and who were more likely to articulate those skills to the researchers. However, narrowing the focus to these
skilled readers did not provide an authentic view of what occurs in the typical classroom. All children must read, not just the successful. Therefore, this current study added another snapshot of what occurred when sixth-grade students of varying abilities read sources found on the Internet to answer content questions.

**Problem to Study**

Traditional forms of literacy continue to play an important role in communication, but frequently, literacy happens in an electronic venue, a multimodal environment that continues to change the way alphabetic literacy occurs (Gee, 2000; Leu, D.J., Kinzer, C.K., Coiro, J., & Cammack, D., 2004; Kinzer, 2003). These environments can include space on the Internet such as blogs, wikis, Facebook, and chat rooms, or they can include environments such as text messaging with cell phones on which people can even read electronic books or e-books. Today, children as young as eight own their own phones which they use primarily to text their friends (Plester, Wood, & Joshi, 2009); in fact, over half of young adults prefer texting over talking on the phone (Reid & Reid, 2005). Instead of reading paragraphs of text in a handwritten letter as their grandparents or parents once did, these children read abbreviated, specialized shorthand on the two inch screen of a cell phone. Frequently, elementary age children also maintain their own Facebook pages which provide a different reading format. Each of these technologies creates an interesting, and often changing, environment that influences how students interact with each other as well as with the global community. New technologies may also influence a reader’s ability to understand the text’s message. While this current study did not focus on the wide range of technological devices being used by students today, each of these devices plays an important role in the overall picture of the digital
world which children navigate on a daily basis, and, consequently, may have influenced the behaviors exhibited by the participants. The current study intended to provide educators, both classroom teachers and the institutions that prepare them, and researchers with a better understanding of how adolescents approach reading when they are assigned content questions regarding a specific Internet source.

Little is known about the strategies readers use when reading online articles, and researchers have much to learn by watching readers as they interact with Internet resources. When sixth-grader Lucas, the previously mentioned younger brother, was asked to look for information on the Internet for a school project, he didn’t print the articles, write on the papers, or read the selected web pages from beginning to end. Instead, as this researcher watched during this informal observation, Lucas scanned quickly for information on population, climate, and culture, following the outlined questions his teacher had provided for the assignment, often jumping quickly from one point in the web site to another point if he did not immediately find the information he thought he should locate. Instead of reading in the traditional sense of the word, using the reading strategies his primary elementary teachers had set in place through modeling and practice-- tapping into his prior knowledge, predicting, and making inferences-- Lucas completed this reading event with perhaps an additional set of reading strategies, ones more attuned to the environment of Internet reading.

Classroom teachers, like the social studies teacher who assigned Lucas the country project, often assume that the reading strategies a student uses while reading a static text are parallel to and adequate enough to read material found on the Internet. The current research project examined whether this is a valid assumption; in this case,
researchers have suggested the strategies traditionally used for reading a large quantity of text may no longer adequately meet the reader’s needs (Henry, 2006; McNabb, 2006). As the reader interacts with more fluid reading experiences, including navigating through a variety of online, non-fiction sources, she must evaluate the material in order to sift through the important and unimportant information, making decisions rapidly as to the direction of her reading (Coiro, 2003; El-Hindi, 1998; Henry 2006; Spiro, 2004). To an extent, this is also the situation when a student is asked to answer questions using her social studies textbook; she may quickly scan the chapter or section looking for words that match those in the questions. However, researchers suspect distinct differences between printed and digital texts and they suspect the use of new comprehension strategies as well (Coiro & Dobler, 2007). Unfortunately, until recently, the research community had virtually ignored this field of study especially when considering approaches to reading the Internet (Leu et. al., 2007, April), but with its multi-faceted implications for education, this aspect of reading research needs immediate attention.

If students do use a different set of reading strategies while reading the Internet than the accepted strategies for static text readers, educators must explicitly teach these different or additional skills and strategies just as they teach reading strategies for static text. Because reading is such a large field, too many aspects could have confused the research. In order to make this project manageable, the researcher acknowledged the breadth of reading and the even larger context of the multimodal world in which today’s students interact. With that understanding, this particular research project focused primarily on the isolated reading event involved when a sixth-grader conducted research for specific content questions using only an assigned Internet site.
Research Question

What reading strategies do sixth grade students of varying reading abilities use when answering questions by reading a source on the Internet?

Definition of Key Terms

Affordance – suggested by psychologist James Gibson as the influence the environment has on the interaction within an event (Gibson, 1954; Greeno, 1994)

Comprehension – “process of simultaneously extracting and constructing meaning through interaction and involvement with written language” (Snow, Burns, & Griffin, 1998).

Hypertext - information on the computer screen linked to a database which can be easily retrieved by the Internet user

Navigating – making informed decisions to work oneself around a web page, involving selecting which links to click on by anticipating what kind of information might be found because of that decision to follow the link

New Literacies – new or different reading, writing, and communication skills needed to interact with the Internet (Leu, Leu, & Coiro, 2004)

Online – Resources connected through the Internet

Reading – an intricate system of obtaining meaning from text that requires understanding how speech is connected to print, decoding new words, reading fluently, possessing background knowledge, using reading strategies to create meaning, and possessing a motivation to read (National Institute for Literacy, 2009)

Think Aloud – cognitive strategy used to slow down the reading process with the goal to look at the way skilled readers make meaning from what they are reading (Think
Aloud); talking about one’s thinking while she reads (Keene & Zimmerman, 2007)

**Significance of the Study**

Defining the term literacy often poses a distinct problem, for it seems to mean slightly different things to different groups of people. The National Center for Education Statistics (2009) included a definition which focuses on the task of reading: using information, both printed and written, to interact with society and to fulfill one’s potential. Adding to this definition, the National Institute for Literacy (2009) defined literacy as an intricate way to obtain meaning from text that requires understanding how speech is connected to print, decoding new words, reading fluently, possessing background knowledge, using reading strategies to create meaning, and finding a motivation to read. Each of these limiting traditional definitions of literacy, however, ignored the multiple environments in which today’s readers interact, and these definitions certainly no longer met the demands of a twenty-first century society (Leu et al., 2007, April). Instead, the definition must morph from the traditional definition to include the social language a person uses to navigate social settings and situations (Coiro, 2003; El-Hindi, 1998; Gee, 2000; Henry 2006). And, it most certainly must include the skills and strategies a person uses while surfing or navigating and reading information found on the Internet.

Researchers can no longer consider literacy a static term. Instead, they must view literacy as deictic, indicating that the characteristics associated with literacy change quickly in relationship to the context of the reading event (Fillmore, 1975; Labbo & Reinking, 1999; Leu, 2000). In a sense, literacy has always possessed this characteristic;
its meaning depends on the technology being used and how society views its uses (Leu, 2000). The twenty-first century definition of literacy changes so quickly because it is related to the rapidly changing technologies used for literacy, and yet society’s definition lags behind these changes (Leu, 2000; Lam, 2007), and yet examples of a more rapid change do occur. One can simply think of how quickly the term “Google” entered the lexicon, finding its way into dictionaries as several parts of speech. Other researchers, though, have defined literacy as a reader’s interaction with the text (Goodman, 1976; Rumelhart, 1994). Interestingly, though, according to Rosenblatt (1994) this definition relies on the transaction of the reader’s personal experiences with the reading experience as well as her feelings toward the reading event. The reader must interact with the text in order to understand it, bringing her previous experiences each time to the reading event. In response to this new generation of learners and new technologies, some have broadened the definition to include information technology (Wepner, Valmont, & Thurlow, 2000), and one can see how the definition that includes transaction applies even to this ever changing reading environment. When a reader sits down at a computer, she brings with her previous experiences with similar web sites and topics. One can see in the electronic medium how the traditional use of the alphabet in writing and reading has been absorbed. While this new realm of reading and writing places additional demands on those learning to read (Kinzer, 2003), even this definition has roots in the perspective of traditional interactions with printed text (Leu, Kinzer, Coiro, Cammack, 2004), and the definition implies that reading a static text is the same as reading an electronic text.

The flashing, colorful graphics, and often-crowded pages can pose a problem for Internet readers that they do not encounter while reading a printed text. Furthermore, the
expository nature of the Internet requires students to read with a different set of strategies than those needed to read narrative texts, especially when considering the numerous links that lead readers to definitions, other material, and even video or audio footage that can both enhance and detract from the reading experience (Schmar-Dobler, 2003). The very nature of hyperlinks eliminates the traditional boundaries of a site used for answering homework questions. Every time a reader opens a website, even returning to the same site on different occasions, the reader faces a different reading experience, and yet every time a reader returns to a printed text, the physical experience is the same; the order of the printed words on the page simply does not change. Instead of being controlled by the text, the Internet reader controls the online text by the choices she makes while reading; this may require perhaps an additional or at least different set of strategies. Too often, the traditional definitions of literacy and text, as well as the understanding of nontraditional and nonlinear formats, do not match the reality of today’s reading environment (Alexander and Jetton, 2000; Leu, 2007; Leu, 2007, May).

The academic environment has started to recognize the multi-faceted environment of reading; as a result, it has included technology within its learning standards. According to Standard 2 of the Indiana academic standards for sixth-grade reading, “students read and understand grade-level-appropriate material,” and the substandard 6.2.1 indicates that sixth-graders can “identify the structural features of popular media (newspapers, magazines, online information) and use the features to obtain information” (DOE, 2011). In fact, technology, especially using the Internet, appears several times throughout the academic standards such as in the previous statement and in the science sub-standards (DOE, 2011). However, even though the Indiana Department of Education
includes technology in these important academic standards, the state of Indiana does not test its kindergarten through twelfth grade students on technology nor does it require teachers to have any course work in technology that examines the relationship between reading and the Internet (National Center for Educational Statistics, 2007-08). These two facts indicate that while Indiana recognizes technology’s important role, the state doesn’t ask its teachers to prepare for or demonstrate proficiency in technology. As a result of this poor preparation, students are not taught the necessary skills for finding, evaluating, and reading information found on the Internet, important skills needed for the twenty-first century (Leu, Zawilinski, Castek, Banerjee, Housand, Liu, & O’Neil, 2007). Educators must acknowledge that the 21st century has demanded that reading skills must expand, and readers of the Internet must do so quickly and with faster comprehension (International Reading Association, 2009).

Basic Assumptions

Throughout this current study, the researcher made several basic assumptions. The first assumption included the participants’ familiarity with the Internet. Because the participants were selected from a group of students who have Internet access in their homes and because they indicated their Internet use on a survey, the researcher assumed the students had developed adequate Internet skills in order to participate in the online reading activities designed by the researcher. The researcher did not have to train the students in using the medium. Because the participants attended the same intermediate school and had instruction with the same reading teacher using the same adopted reading curriculum since August 2009, the researcher also assumed that the students had a similar school-based literacy background. The researcher acknowledged that each participant
brought his and her individual reading experiences and previously developed reading strategies to the Internet reading sessions, but each of the participants shared a consistent approach to reading instruction for each of the trimesters of their sixth-grade year. Even though reading is an individual relationship between reader and text, the participants did have a common experience in the learning environment. A final important assumption made by the researcher was that there are established reading strategies used by the successful readers when they read printed texts including during reading strategies such as skimming, making notes, paraphrasing, and looking for specific words (Pressley & Afflerbach, 1995).

**Basic Limitations**

One immediate limitation was the difficulty of fully understanding what was occurring in the participants’ minds as they interacted with the Internet, especially when the participants were only eleven to twelve years old. Asking participants to think aloud (Afflerbach, 2000) while they are performing a task has been an accepted research practice since the 1980s with Ericsson and Simon’s (1980, 1990) introduction of the think aloud protocol; using the think aloud helped alleviate part of this limitation. While the researcher relied primarily on the students’ abilities to verbalize their thought processes, she videotaped each of the individual sessions and transcribed the videotapes. Additionally, she implemented Camtasia software as a means of capturing the navigating steps the online readers took. The use of this particular program allowed the researcher to clarify navigating decisions that she was unable to capture on the videotape. Camtasia recordings were used only three times, in cases that lacked clarity on the videotapes. Observation notes also lent themselves to clarifying elements of the transcripts. While
the classroom teacher tried to indicate which students were more articulate and the participants indicated their willingness to talk with the researcher, complete knowledge of what occurred inside the readers’ minds was impossible; however, valuable information about the reading process was gained through these conversations, observations, and analysis of the web capturing records.

**Summary**

Educators have no control over changes in technology, and yet they have a responsibility to their students to prepare them to adapt to new situations, especially when the majority of states have incorporated technology standards into their state academic standards for k-12 students. Reading on the Internet is an activity that continues to increase in use, and as schools integrate the use of this medium into their homework assignments and class activities, teachers must be prepared to teach their students to effectively read Internet sources. If differences do exist between strategies used to read static text and strategies used to read Internet text, teachers must teach the different or additional necessary skills and strategies. This research project examined the strategies used by sixth graders as they read preselected web sites to answer questions predetermined by the researcher and added to the literature about how students read Internet sites.
Chapter II: Review of the Literature

This chapter reviews past research on reading strategies that children use while reading Internet sites for information. It examines accepted research on different types of readers as well as research on the reading strategies used when reading; these are the strategies often taught to beginning readers and to those readers intent on improving their comprehension. Research on the prevalence of technology is included in this chapter, and relatively recent research on the new literacies faced by readers of the Internet is also summarized.

Technology

In the United States, nearly one hundred percent of all k-12 classrooms have access to the Internet (U.S. Census Bureau, 2001; Schmar-Dobler, 2003), and the children and young adults within these classrooms use this medium for a multitude of purposes. More importantly, over half (fifty-five percent) of all American households have access to the Internet, with over three-fourths of twelve to seventeen-year-old Americans using the Internet whether in their homes, at the library, or at school (Castek, Bevans-Mangelson, & Goldstone, 2006; Lenhart, Madden, & Hitlin, 2005; Schmar-Dobler, 2003; U.S. Census Bureau, 2005). In fact, sixty-three percent of teens who report using the Internet use it every day (Pew Internet, 2009). Surveys of American families indicated that ninety-three to ninety-five percent of teenage students, ages twelve to eighteen, use the Internet for a wide variety of reasons (Jones, 2009; Pew Internet, 2009; Kaiser Family Foundation, 2003), but even though people can use the Internet for gaming and other entertainment purposes, the most frequent uses of the Internet include communicating with others and for obtaining information, often for academic
assignments as is implied by the number of teens who turn to the Internet for homework answers (Gross, 2004; Willoughby, 2008). The computer with Internet access has become a required tool for information retrieval and for communication. With the Internet, people can participate in blogs, wikis, video and music downloading, online communities such as Facebook, and virtual reality games. In these environments, Internet users interact often in abbreviated ways with other Internet users, using their own virtual shorthand, and sometimes they are communicating with people they do not know personally. No matter what the medium, this Net generation, children born into a world filled with technology, are always instantly connected (Oblinger, D.G. & Oblinger, J.L., 2005). They also use the Internet to access articles and personal and professional websites; as a result of this instant access to information, print media is no longer the only way to communicate, and literacy has evolved in such a way that society has changed the way it uses and shares information (Coiro, Knobel, Lankshear, & Leu, 2008). Because of the heavy dependence on technology, particularly the Internet, the very essence and structure of reading has morphed into a situation that no longer simply includes paper with visual symbols representing language (Leu, 2007). When today’s teenagers hanging out at the mall can Google the answer to a question, check their email or update their Facebook status through their iPhones linked to the World Wide Web, they demonstrate the reality of this changing reading event.

American teenagers, sometimes called “screenagers,” do not simply rely on the Internet for their technological needs; instead, these screenagers daily use twenty-first century technologies like cell phones; e-books; blogs; social networking sites such as Facebook, MySpace, Twitter, and Skype; online video games; gaming devices hooked to
the Internet; and video making software they freely share on sites such as YouTube (Allen, Aug. 2010). For example, adolescents between the ages of twelve and seventeen have been the population that has demonstrated the greatest growth in cell phone ownership, with nearly seventy-five percent of this group owning a cell phone (Pew Internet, 2010). According to the Pew Internet study, demographic differences have little impact on the ownership of the cell phone. Four out of five of these teens admit to having slept with their cell phones with them or beside them using it as an alarm clock or so they can be in constant contact with their peers even if it means accepting a text in the middle of the night (Pew Internet, 2010). Another report by Pew Internet (2009) indicated that seventy-nine percent of teens own an iPod or mp3 player and eighty percent own a gaming device such as a Wii, Xbox or PlayStation, with boys (ninety percent) are more likely to own a gaming device than girls (only seventy percent).

Today’s student not only sits in a classroom, learning in the traditional formats, but she has the capability of enrolling in online learning classes as well. High school students value the ability to earn college credit which may indicate why the number of students taking an online class nearly doubled between 2008 and 2009 when twenty-seven percent of high school students took an online class (Speak Up 2009, 2010).

**Twenty-first century skills and the changing definition of literacy.**

With the increased use of ever-changing technology, current and future generations need a different or additional set of skills, skills people of even a decade ago could not fathom. In order to determine what the Net Generation looks like, the North Central Regional Educational Laboratory and Metiri Group (NCREL, 2003) gleaned data from a rather extensive review of literature as well as data collected from businesses and
educators, concluding that what used to be considered literate no longer meets the needs of students. The traditional, or foundational, definition of literacy implicates the print found on a physical piece of paper, and it involves understanding the letters and ultimately the words printed on that page, but the scope of literacy has expanded, and it makes sense that today’s definition of literacy must expand as well (Reinking, 1995; Biancarosa & Snow, 2006; Miners & Pascopella, 2007). Because of the complexity in the process, reading must concern “genre (e.g., literary reading vs. graphic novels), form (instruction manuals vs. email), duration (sustained vs. non-continuous), purpose (e.g., functional vs. supplemental, motivation (e.g. voluntary vs. required) and medium (print vs. electronic text)” (Wells, 2008). Twenty-first century students must be well-versed in digital age literacy, possess inventive thinking, possess interactive communication, be highly productive (NCREL, 2003), and be people who can monitor their own knowledge and who have flexible thinking patterns (Biancarosa & Snow, 2006). As a result of these changes, classroom teachers have witnessed a new learning environment that incorporates a wide variety of communication and information technologies (Leu, 2007), but they may not be aware or may not have considered the deep implications this new context has on how students learn (Leu et al., 2007). Unfortunately, reading researchers have not given teachers the research or theoretical base for developing reading strategies for the Internet (Leu et al., 2007). This puts educators at a disadvantage for understanding the characteristics or these strategies as well as at a disadvantage for ideas for implementing or teaching of the strategies.

As previously mentioned, the skills students need today to enter a competitive global market must include the ability to navigate the Internet as well as other
information and communication technologies such as blogs, wikis, and email, and this requires them to not simply read and comprehend the words, but to navigate the Internet, find and evaluate relevant information, and synthesize a variety of ideas found in web sources the different ideas gleaned from the web sources (Coiro, 2003; Miners & Pascopella, 2007). In his 2007 keynote address to the International Reading Association’s Research Conference, Donald Leu, former Director of the New Literacies Research Lab at the University of Connecticut, told the members of the Toronto audience that because the Internet was this generation’s defining tool of literacy, today’s teachers must teach contemporary students important new literacy comprehension skills (Leu, 2007). With the depth and breadth of materials available on the Internet, the Web provides schools with an additional and rather powerful tool for finding information, but the Web was not designed for children, let alone for educational settings (Kulper, Volman, & Terwel, 2009). In a school setting, teachers must include activities that introduce and practice these skills. As Leu (2007) mentioned, the power of the Internet extends beyond just locating information.

Since the World Wide Web opened to the public in 1990, an important aspect of functional literacy is the ability to navigate the digital world, as illustrated through the ever-increasing access people have to documents once held behind closed doors, documents which were once inaccessible unless one traveled a distance (Wepner, Valmont, & Thurlow, 2000). For example, twenty-first century students now have access to government documents once held only in protected institutions around the world. Researchers, whether in the elementary grades through adulthood, now have immediate access to volumes once only shelved in libraries. Students in Kansas have
access to important documents found in the Library of Congress or in college archives across the globe. They also no longer have to travel long distances to see museum displays or artwork formerly only held in major cities. The Internet has truly opened the world to children in ways never before imagined. Using the interconnectivity of the Internet, learners have a completely new learning environment and tool, and “searching and comprehending online text is an unavoidable literacy” (Malloy & Gambrell, 2006). Twenty-first century students simply have known no other environment.

Because of this increased access to once inaccessible material, today’s society has the ability to pursue personal interests in ways they have never before had. From the comfort of their homes, people can research hobbies or follow rapidly updated news about their favorite Hollywood stars. Delay in information doesn’t happen as it once did, and frequent users of the Internet often return to their favorite web sites. In their study, Chandler-Olcott & Mahar (2001) examined the different personal literacies people develop when they look at their favorite web sites as well as how they approach their reading and ultimately their interaction with that site. Their study focused on seventh grade students interacting with favorite sites. Interestingly, they discovered that reading strategies used with print text—such as activating prior knowledge, establishing a purpose for reading, and forming questions as reading progresses—have a definite place as students are confronted with the complexities making their way through Web sites. Unlike a bound text, Web sites have no front and back covers to set boundaries. Students need to be able to frame their own boundaries around reading purposes and objectives for both visual and print material they encounter on the Web in order to negotiate the simultaneous multiple layers (Chandler-Olcott & Mahar, 2001). According to the
Chandler-Olcott and Mahar (2001) study, reading printed text, then, is related to reading online articles, but the latter has key differences.

With over one billion people reading on the Internet, one cannot question that it has the potential of having a major impact on the field of education, and in particular, in the lives of students (NCREL, 2003). With this new found freedom, increase in Internet and other technological uses, and the differences in texts, however, comes the implication for teachers that they must prepare students to research and accurately read the material found on the Internet. Unfortunately, many teachers enter the profession not prepared to teach this type of reading. Despite the changes in the last decade, critical literacy education has continued to focus on reading processes applied to a text in the traditional format: newspapers, books, textbooks, etc. (Knobel & Lankshear, 2002). This new generation of learners, though, lives in a time of enormous change, and as a result the definition of literacy has been broadened to include information technology and all the elements related to it (Wepner, Valmont, & Thurlow, 2000). With the rapid adoption of the Internet by so many people, at no point in history has a form of technology had as much impact in such a short amount of time (Coiro, Knobel, Lankshear, & Leu, 2008). Interestingly, even though the Internet is characterized by text and graphics similar to those items found in printed text, especially non-fiction textbooks, little research has examined critical literacy of Internet text (Knobel & Lankshear, 2002). Fully understanding the influence of the Internet, as well as the influences of other information and communication technologies (ICT), is difficult because researchers do not have appropriate and adequate theories, constructs and methods (Coiro et al., 2008). As a
result and despite the obvious need for attention, researchers have been slow in turning their attention to this specific topic in reading.

New Literacies.

As previously discussed, a variety of social forces influence how society defines literacy. Those forces include technology’s importance to competition in a global market, the quick growth of the Internet for finding information and for communicating, and an increase in the onset of global policies by governments to ensure a technologically literate population (Leu, Castek, Henry, Coiro, & McMullan, 2004). The area of the Internet and its influence on literacy is not an area included in simply one discipline; instead, a variety of fields, such as cognitive science, sociolinguistics, information science, law, rhetorical studies, and cultural anthropology, take interest in the impact technology has had on literacy (Coiro et al., 2008; Leu et al., 2007). Obviously, a plethora of new technologies incorporated into the reading process develop every day, and new ideas regarding the definition of literacy and the role of technology will continue to develop as well. For the purpose of this project, however, Leu et al.’s (2004b) terminology and definition provided an adequate foundation for this study: new literacies has emerged to include all of the new technologies with which children interact on a daily basis, including gaming software, Internet communities, and the ability to “surf” the web (Leu, Kinzer, Coiro, & Cammack, 2000; Leu et. al., 2007). While the wide variety of technological tools affect the definition of literacy, even more importantly, they impact what people do in their homes, classrooms, and work environments (Leu, 2000). Unfortunately, a specific definition of these new literacies has yet to be determined and this field of research is grossly underrepresented as well (Leu, 2000; Leu, 2002). The
few researchers in the field of reading and technology, however, have created a working definition of new literacies that includes the Internet and other technological devices that “include skills, strategies, and dispositions necessary to successfully use and adapt to the rapidly changing information and communication technologies and contexts that continuously emerge in [the] world and influence all areas of … personal and professional lives” (Leu, 2000, p. 1572; Leu, 2002). The New Literacies Perspective allows researchers to better understand what occurs during the interaction of student and technology, and serves as a backdrop for what may occur particularly during online reading events.

The New Literacies Perspective uses ten guiding principles for understanding the relationship between technology and literacy. At the very center of the perspective is the recognition that throughout history, literacy and the social context in which it occurs has changed continuously. A quick look at the history of reading instruction can see the influence of major historical or societal events as well as changes in technology that began in the mid twentieth century (Leu, 2000; Leu, 2002). Each stage of reading history has been influenced by some element of society and the influence of the social context cannot be ignored. Included in the guiding ten principles are the global community of the information age, the necessity of new literacies to fully use the capabilities of the Internet and other ICTs, the changing nature of new literacies based on the person’s perspective, a transactional relationship between technology and literacy, a complex nature of new literacies, critical literacies at the heart of the new literacies, need for different understanding strategies, importance of speed, the social construction of learning, and the
important, yet changing, role of teachers in new literacy classrooms (Leu, 2000; Leu, 2002).

Ultimately, most disciplines with a vested interest in the Internet’s influence on habits and skills agree on four characteristics of new literacies. These characteristics include (1) new technologies require approaching literacy with “new skills, strategies, and dispositions;” (2) participating in a global community requires new literacies; (3) with new technologies, new literacies change as well, or are deictic being influenced by the medium being used; and (4) because the new literacies are “multiple, multimodal, and multifaceted, they require a much more complex set of analytical skills” (Allen, Aug. 2010; Leu et al., 2007; Castek et al., 2011). These new literacies will continue to change as technology continues to transform the way people interact with the global community, and when placed in the context of reading, “these new literacies allow [readers] to identify important questions, locate information, analyze the usefulness of that information, synthesize information to answer those questions, and then communicate the answers to others” (Leu et al., 2004, p. 1570).

**Skilled and Unskilled Readers**

Researchers focused on reading comprehension have distinguished key characteristics between skilled and unskilled readers. Skilled readers have a developed bank of strategies and skills which they call on subconsciously (Pressley & Afflerbach, 1995). These skilled readers use these strategies skills before, during, and after reading, employing any number of the thirty-two identified strategies including several with multiple layers (Pressley & Affflerbach, 1995). Summarizing the researchers’ findings, Thompkins (2003) finds “more capable readers are fluent oral and silent readers; view
readings as a process of creating meaning; decode rapidly; have large vocabularies; understand the organization of stories, plays, informational books, poems, and other texts; use a variety of strategies; monitor their understanding as they read” (p. 249).

More skilled readers, unlike unskilled readers, see reading as a process, establishing the biggest difference between the two (Thompkins, 2003). Unskilled readers are also less strategic than their skilled reader counterparts; they do not monitor their reading, and when they do use strategies, they repeatedly use the same strategies (Thompkins, 2003).

Skilled readers of printed text use a variety of reading strategies. Overall, successful readers are actively engaged in the reading process. They not only preview the text through skimming for an overall feeling of the text, but they use the previewing activity to tap into background knowledge (Pressley, 2002; Pressley & Hilden, 2004). Activating this prior knowledge directly impacts understanding (Pressley, 2002; Pressley, Johnson, Symons, McGodlrick, & Kurita, 1989). Skilled readers also take time to reflect on different elements of the text to see if they correspond with their predetermined reading goals (Pressley, 2002). Pressley and Afflerbach’s (1995) research indicates that good readers, those who easily comprehend texts, engage in the reading process before, during, and after the reading event (Pressley & Hilden, 2004).

Capable or skilled readers often use these strategies with little or no thought, whereas below average or developing readers may require more deliberate attention to strategies. Strategies might be observable behaviors such as taking notes while the reader makes progress through the text, or the strategies might be part of the thought process such as tapping into prior knowledge about a participant before reading (Anderson, 2003). When examining the influence of this prevalent access, a direct relationship exists
between the technologies a teenager has available to her and her literacy practices (Gibbs & Krause, 2006). Young people like JimJim, a middle-class white teenager, play computer games, listen to MP3 songs, send emails, enter chat rooms, and do their homework often simultaneously (Gibbs & Krause, 2006). JimJim, a strong reader, has successfully applied his reading skills to technology. On the other hand, African American Kadesha, a low-income New York City teen, uses the Internet in a completely different manner than JimJim. Instead of entering sites that require reading, she avoids those sites that are text-heavy. When her teacher asked her to investigate careers, she inaccurately entered the word ‘bakery,’ and even when corrected, she was unable to comprehend the material due to her low reading ability (Gibbs & Krause, 2006).

According to Gibbs and Krause (2006), some students have the skills to use technology in entirely different ways than other students creating a bigger threat of the digital divide than simply whether or not students have access to computers.

In the past, researchers suggested that students should learn how to comprehend reading of static text prior to learning how to comprehend Internet sources. Research from the National Reading Panel (2000) and Snow et al. (1998) indicated that instruction for less capable readers must be sequenced in a methodological manner. However, researchers Castek et al. (2011) suggested that perhaps struggling readers actually benefit when provided opportunities to read online. These researchers argued that reading materials on the Internet provides important experiences as well as develops the readers’ “capacity to learn how to learn” (Castek et al., 2011). Interestingly, the research has failed to consider both sides of this argument, looking at not only how to structure the reading events, but the benefits of allowing students to read material in a different setting.
Exceptional Learners and the Internet

Because the researcher did not use reading level or learning ability as a criterion for being selected as a participant, it was important to understand how students’ exceptionalities may impact their reading of Internet sources. Students with learning disabilities often do not find success in school, and as a result, they do not feel engaged in the learning process (Barton-Arwood, Falk & Wehby, 2005). Students with exceptionalities in the typical classroom aren’t limited to those with learning disabilities. The list of exceptionalities is rather extensive including autism, ADHD, emotional or behavior disorders, and so on. Regardless of the exceptionality, difficulty with reading is one of the academic areas with which exceptional learners struggle. For example, students with emotional/behavioral disorders struggle with phonological awareness, decoding, and other important skills needed for reading success (Barton-Arwood et al., 2005). Those with Asperger Syndrome, part of the autism spectrum disorders, often comprehend below grade level when asked to read silently (Myles, Hilgenfeld, Barnhill, Griswold, Hagiwara, Simpson, 2002). These students with AS often struggle to make inferences, again when asked to read to themselves (Myles et al., 2002). Others with exceptionalities such as ADHD often have trouble focusing on the reading event, and a child with “a primary problem with reading might contribute to inattentiveness or disruptiveness in the classroom” (Carroll, Maughan, Goodman, & Meltzer, 2005). Even with intervention, most of these students with exceptionalities continue to struggle with reading comprehension (Carrol et al., 2005), and placing them in a reading environment that inherently comes with distracting pictures, graphs, and even videos, these readers with exceptionalities may face a different set of problems.
Differences in Texts

Within the past two decades, a shift in American classrooms has occurred between solely or primarily reading narrative texts to practices that now include informational texts. Studies conducted by Pappas (1993) and Duke (2000) indicated that children could read informational text, and in fact, often prefer informational text; by not having early exposure to a variety of literature, students would be limited in developing the full set of reading skills they would need (Gambrell, 2005). As these findings infiltrated the educational system, teachers, even those in the primary grades, began incorporating more nonfiction into their instructional practices. The debut of the Internet and the integration of the computer in a large number of classrooms occurred almost simultaneously with the publication of research that called for introducing young children to this variety of texts; this event created a large amount of information available to students (Gambrell, 2005). Many educators have assumed that reading online and reading printed text are isomorphic, and it is nothing more than directly transferring reading skills from “book space to cyber space” (Knobel & Lanksheer, 2002). However, emerging research has begun to show differences between the two. Research by Coiro and Dobler (2006) and Coiro (2007) suggest that while the two types of reading share common characteristics, additional skills and strategies are required by students reading the Internet (Leu et. al, April 2007; Coiro, 2003; Leu, Kinzer, Coiro, & Cammack, 2004; Snyder, 1998). Ultimately, one cannot ignore the differences, for printed text is “linear, static, temporally and physically bound, often with clear purpose, authorship and authority” and digital text “is nonlinear, multimodal with a heavy visual orientation, interactive, unbounded in time and space, with murky conveyance of authorship and
authority” (Dalton & Proctor, 2008, p. 297). These differences indicate a shift in reading strategies needed from printed text to digital text or text found on the Internet.

The primary difference between reading the printed text and reading the Internet text is the Internet’s use of hypertext, a term coined in 1965 by Ted Nelson (1998) to define the concept that links one text to bits of other text and even entire sources. Because of this advent of hypertext and rapid changes in the world of computer technology, this type of reading is similar, but not parallel to reading a traditional piece of text. Accordingly, the nature of hypertext possesses the ability to fundamentally alter how people write, what they read as well as how they read, and the way teachers teach reading skills (Charney, 1994; Salmeron, Kintsch, & Canas, 2006). Because of its inherent flexible nature, hypertext allows readers and writers to extend beyond the natural boundaries of text as they navigate through a linked world of texts, graphics, and commentary (Charney, 1994; Kamil and Lane, 1998; Salmeron et al., 2006). For a student, the primary difference between reading printed text and reading Internet text is that when she reads the Internet text, she decides the order of her reading event (Salmeron et al., 2006); the nature of hypertext creates a new reading event each time.

When a student reads material on the Internet, she has choices to make, particularly whether or not she follows a hypertext link or not and which one she should click on that might take her to finding the information she is seeking (Salmeron, Kintsch, & Canas, 2006). More recent research has indicated that Internet readers use two specific strategies when interacting with hypertext: coherence and interest (Salmeron et al., 2006; Ainley, Hidi & Berndorf, 2002; Foltz, 1996). Text coherence refers to the reader’s ability to see relationships between the ideas presented in the same text, and the interest strategy
refers to the reader selecting links she finds more interesting (Salmeron et al., 2006). Both of these strategies rely somewhat on the reader’s prior knowledge, and ultimately, they have an impact on the extent to which the reader comprehends the text. Simply because a student knows how to move around the Internet does not automatically imply that she has the skills needed to navigate and read the Web (Burke, 2002). Some reading strategies used for static text are important for reading on the Internet. In fact, one of the most important strategies is asking the right question. Good readers of the Internet mentally pose questions before they begin their Internet search, and this questioning is an integral part of the search process (Burke, 2002). Scanning is another important skill for readers of the Internet, as the reader navigates through the web page, looking for answers to her questions. She must not only navigate, but quickly evaluate the sites to determine its value.

The differences between the traditional printed text students have historically faced when reading their textbooks and the nonlinear texts found on the Internet can create problems for Internet readers. While each web site is unique and designed according to the producer’s approach to web design, hyperlinked text can confuse readers resulting in a necessary and different thought process as they encounter these hyperlinks (Coiro, 2003). Coiro’s (2003) research has demonstrated that Internet readers require a different type of inferential reasoning to evaluate the differences and decide whether selecting a particular link will add to or hinder comprehension. Other aspects of text also add to the complexities of comprehending Internet sources: multiple-media texts and interactive texts. Students reading online sources find a variety of visually stimulating characteristics that either enhance their reading comprehension or distract them during
the reading process. These characteristics include a plethora of visuals that include photographs, interactive questions, imbedded videos, etc. Because readers make choices as they navigate Websites, students have the power to personally adapt the text’s information, acting as a coauthor of the text (Coiro, Feb. 2003). Instead of simply reading the linear text presented by an author as traditionally occurs when a reader interacts with a printed text, Internet readers have more choices to make, and for some readers, this could potentially create problems. As cognitive theorists have discovered, people can only attend to a few things at any given time; as people read, they build a hierarchically structured mental picture of what they have just read (Charney, 1994), but when reading online, following one hypertext link to the next, the text no longer possesses a coherent and logical development. Instead, this hypertext environment may get in the way of comprehension (Kamil & Lane, 1998), and it may in fact, put even more demands on a reader’s critical reading skills (Kuiper et al., 2009). According to Kamil & Lane (1998), the field of reading needs to expand the research in order to examine the “underlying cognitive processes of reading hypertext among readers of varying abilities” (p. 333).

When k-12 classroom teachers ask students to read material online, the students have a specific purpose for reading: gather information. At home, while surfing the Internet in their leisure time, their purpose can be quite different: entertainment. Too often, the Internet reader simply wants to surf through the material, gleaning information to answer a question (Burke, 2002). Instead of truly reading the material for comprehension, they are only skimming their way through the content, and often they “mistake their ability to move around the Internet for the skills that they need to navigate
and read it” (Burke, 2002, p. 38). Frequently a young reader approaches reading online with the same strategies she uses when reading an expository printed article, but the nature of the text changes because the Internet is written in hypertext with links, headings, and other graphic elements connecting ideas (Schmar-Dobler, 2003). What teachers once stressed as reading comprehension strategies may not be fully appropriate for students reading information on the Internet. Reading research has indicated that in order to make the most of reading, readers must understand the structure of the text as well as the content in order to use clues to uncover meaning, but not too much so that they do not ignore important elements (Goldman & Rakestraw, 2000). Using text-driven processing, readers use the predictability of the type of text and its structure to aide in their understanding. According to Goldman and Rakestraw (2000), benefits exist for explicitly instructing students on how to read a text’s structure, especially when a student’s prior knowledge of the participant is minimal. This definition and process of increasing students’ comprehension does not include computers’ impact on these elements. When a student looks for information online, she approaches reading with a different purpose and uses different strategies than she does when reading an encyclopedia or a magazine article. Elements such as hypertext demand a different type of attention, and when researchers and educators realize this, they will create activities conducive to this type of reading; as well, they will teach specific strategies for reading text with hyperlinks.

**Potential problems.**

In order to successfully engage students in the reading process, classroom teachers select engaging texts to which readers can connect (Tancock, 1994). The
teachers then encourage children to connect with their reading, extending, refining, and clarifying what they think about their reading” (Tancock, 1994). Students learn to read texts, especially non-fiction pieces, by looking at the title of the piece as well as headings, topic sentences, and overviews (Goldman and Rakestraw, 2000). After reading texts with similar structures, they know what to expect in later reading situations, and can apply the learned strategies. Through this process, they develop the schemata to pick up a similar text and apply those skills. When the reader engages in reading online, the new reading environment, which includes the Internet with hypertext that emphasizes browsing, may eventually stand in the way of the reader’s ability to comprehend the texts; unfortunately, it may impact her ability to locate information related to a specific question and even with more limited and pragmatic efforts to find information relevant to some specific question. Ultimately, the Internet’s hypertext system may not be appropriate for educational purposes, when one must attend to the structure and meaning of text instead of for pleasure (Charney, 1994).

Too often, Internet readers quickly select the link they find most interesting, and eventually, this Internet reading behavior may create large gaps in the way information is gathered, especially by an inexperienced or the less capable reader, possibly creating problems with comprehension (Salmeron et al., 2006). Reading on the Internet involves understanding how to interpret the results from the search, being able to navigate the complicated levels of the hypertext, pulling together the vast information, and sorting through the most and least important information (Kuiper et al., April 2009). The purpose for reading ultimately influences the strategies used when reading online articles.
Considering the characteristics of the Internet, an online reader has enormous choices. Mary McNabb (Dec. 2005/Jan. 2006), the Director of Learning Gauge, indicated that by merely clicking on a hypertext link she can take the reading event to a totally different piece of text that may be different in structure and in content than the original source. McNabb explained that readers of the Internet have constant decisions to make about which hyperlinks they should choose and why. To illustrate this phenomenon, McNabb compared two average readers, one male and one female. When the health teacher gave them an open-ended assignment to use the Internet for research, the female student’s approach to completing the assignment was disorganized and she was easily distracted by the hypertext. She eventually followed a link from the Lance Armstrong web site to “Which Bike is Right for You?,” a site that drew her interest; however, the link took her in a direction other than what the assignment demanded. On the other hand, even though the male student was also an average reader, his level of engagement was higher than the female’s. He appeared more familiar with the Internet and because he had an interest in the health topic, he was able to navigate his way through the hypertext and make appropriate reading decisions. Because the male student actively monitored the content of his reading as well as what happened when he selected hypertext links, he was able to monitor his understanding and make the decision to return to the assignment (McNabb, Dec. 2005/Jan. 2006). Both readers used different techniques, one better than the other, and both exhibited reading behaviors that illustrated how important particular reading strategies are to reading on the Internet.

While McNabb’s comparison of the female and male students provided researchers with only one small snapshot of the online reading event, her research also
provided insight into students navigating their ways through hypertext. Because of their varying levels of comfort with reading for information on the Internet, online reading assignments often pose problems for students, especially those who do not adequately or regularly monitor for understanding (McNabb, Dec. 2005/Jan. 2006). If the student doesn’t already have adequate comprehension skills already developed, she will find reading online difficult. Each web site is uniquely designed, and as previously established hyperlinked text can confuse to readers; research has demonstrated that a different cognitive state is needed when readers participate in online reading activities (Coiro, 2003). When a reader enters the digital world of the Internet, several disadvantages may occur for her. She may get lost and waste time in navigation, she may be distracted by the advertising, and she may not read at the level of the web site she enters (McPherson, 2005). For the online reader, then, she must develop a way to navigate the online text and quickly measure the importance of the various hyperlinks with which she comes in contact (Coiro, 2003), just as the male student in McNabb’s research (Dec. 2005/Jan 2006) did. Obviously, the text found on the Internet has different characteristics than linear texts, but the importance of the structure of text whether it is in a linear or nonlinear form plays an important role in the overall understanding.

When an adolescent reads information on the Internet, she requires specific skills, and yet she may have never received formal training in these skills. She must not only be able to comprehend what she is reading in the traditional sense of comprehension, but she must also have the strategies to navigate between web sites as well as within a web site, anticipate the type of information she might find if she follows a hyperlink, pull together information from different web sites through synthesis, and evaluate the Internet
resources critically (Castek, et al., 2006; Coiro, 2003, 2005; Leu, 2002; Miners & Pascopella, 2007). Unfortunately, little instruction in how to apply these skills and characteristics to the Internet occurs in twentieth century schools. When students have access to the Internet for the reading selection, teachers often do not maintain control of the reading materials, and their role in the reading process changes dramatically. In the past, the teacher confidently assigned specific pages in a printed textbook for students to read, assured that she had read exactly what she has asked her students to read. In fact, this prepared teacher could create a reason for reading and provide her students with specific content to look for as they read. Today, however, students have great control over the direction of their reading on the Internet simply based on the hypertext links they choose or the rate at which they “surf” the site. The teacher cannot expect to read everything that her students might read as they navigate the Internet, for she has no way of knowing the direction her students will choose within the reading context. As a result, teachers become facilitators of learning, requiring them to explicitly teach children to be aware of the complexity of reading comprehension and to prepare children to read in a variety of forms of media (Leu, 2000). The reading skills traditionally accepted are still necessary as children read on the Internet, but these traditional skills are not sufficient (Coiro and Dobler, 2007).

Bracha Kramarski and Yael Feldman (2000) continued the examination of the Internet’s impact on reading when they randomly selected fifty-two junior high school students (twenty-five male and twenty-seven female). The researchers assigned the students to one of two groups: an Internet group and a control group, working in a regular classroom. After a two week period of using questionnaires to evaluate various
aspects of the students’ processes, such as motivation, comprehension, and metacognitive awareness as well as observations of three pairs of randomly selected students, after a two-week period, Kramarski and Feldman (2000) found no significant difference between the Internet and control groups for reading comprehension. In fact, the students not exposed to the Internet did better than the Internet group and when the researchers examined the strategies used to comprehend the reading, they discovered a rather significant difference in the groups’ abilities to determine the authors’ opinions.

In this same study, Kramarski and Feldman (2000) examined the subjects’ use of metacognitive awareness when reading. They observed this metacognitive strategy by itself was not internalized by the Internet group. Through the observations Kramarski and Feldman (2000) concluded that the group failed to implement the metacognitive strategy correctly and therefore failed to surpass the accomplishments of the control group. In addition, some technical problems were noted, which interfered with the students’ concentration and wasted time allotted for the assignment (Kramarski & Feldman, 2000).

The researchers did make a point to emphasize that the group used were eighth graders, and typically children in this age group struggle with concentration and the ability to adhere to learning goals, especially when placed in a new situation (Kramarski & Feldman, 2000). When they turned to the element of motivation, though, the Internet group of students demonstrated much more motivation than those in the control group (Kramarski & Feldman, 2000). The study did not indicate an influence of reading online on reading comprehension; Kramarski and Feldman pointed out that technology is not the fix for improving students’ comprehension, but they indicated there is a need for
educators to develop metacognitive instructional methods that can be implemented with
the Internet. Furthermore, they indicate the use of the Internet must begin early in a
child’s life so s/he is not distracted by the novelty of the Internet.

Authors Reinking, Labbo, and McKenna (2000) continue the philosophy that a
framework must be designed to better understand the integration of technology in
learning, especially literacy. These researchers examined what occurs when technology
becomes part of the educational fabric instead of simply being added to instruction in
isolated ways. Before examining the impact of technology on literacy instruction,
Reinking, Labbo, and McKenna (2000) maintain that a framework built around Piaget’s
classical theory can help researchers see a process of assimilation and accommodation of
technology. This framework provides a way to think about integrating technology into
research and instruction that acknowledges a natural movement from the more transient
posture of assimilation to a more long-term and substantial view characteristic of
accommodation and eventual developmental maturity.

According to their findings and supported by research completed by the New
Literacies Research Center at the University of Connecticut, literacy itself may change as
technology changes. This shift, however, requires growth of the teachers and a
willingness to experiment; eventually, the shift will occur when technology finds its way
into schools in such a manner that it no longer seems strange or different in classrooms.
As they point out, digital reading and writing have permeated into daily literacy and no
one can deny the influence it will have on what society perceives as literacy (Reinking et
al., 2000). Educators today are in a rather difficult situation. While schools still rely
heavily on traditional print material and they will for quite some time as new digital
mediums integrate themselves into the education field, teachers are preparing children to read and interact in a world that will contain technology no one can even fathom at this point. According to the authors, educators need to recognize that they are moving between “assimilation and accommodation” (p. 117). Reinking, Labbo, and McKenna (2000) argue that instructional activities intending to generate electronic literacy should include authentic activities that allow students to “compare and contrast printed and digital documents” as well as give teachers and students the chance to discuss “differences between printed and digital documents,” and most important, provide strategies for interacting with the digital environment (p. 117).

Using quantitative research based on her 10-week study of a primary school in the eastern suburbs of Melbourne, Australia, Sutherland-Smith (April 2002) examined student perceptions in reading Web text as opposed to print text. Her research led her to observe and informally speak with 48 students, 29 females and 19 males, between the ages of 10 and 12-years-old. Sutherland-Smith (April 2002) attended the school every day visiting two settings: a traditional English class based on pen and paper, and a digital English class based on computer writing. She concluded that students viewed the reading of information presented online different from the text they read in traditional books. Based on her informal discussions with the students, Sutherland-Smith (April 2002) speculated “a snatch-and-grab philosophy adopted by students in the web text classroom that was not apparent in print text environments” (p. 664). Another important observation Sutherland-Smith made involved the speed at which students can access information online. Sutherland-Smith (April 2002) observed that students expected, indeed almost demanded, that the Internet produce immediate results. However, they did not have
similar expectations for print text. Students expected to devote time, perhaps several library sessions of 45 minutes duration, looking at books, and did not expect instant gratification in their task.

**Theoretical Frameworks**

Two key learning theories created the framework for this particular study: schema and cognitive flexibility. Each weaves itself through the other in an interesting way. The first, the schema theory built upon Jean Piaget’s 1926 work provided the research a foundation in the way the mind works to learn new knowledge. General knowledge, otherwise known as prior or background knowledge, allows people to connect concepts. Readers, using background knowledge on which they can attach new knowledge, gain understanding because of what they knew before reading. Cognitive flexibility builds on this theory of schema, but looks at how the mind accepts new knowledge. This theory relates directly to reading on the Internet, because it is interested in the way learners, or readers in this case, approach new situations. With the ill-structured nature of the Internet, readers have ample opportunity to interact with new information, assess it according to what they already knew, and then accept or reject the new information based on prior knowledge.

**Schema theory.**

Based on the work of cognitive psychologist Jean Piaget, R.C. Anderson developed the schema theory, a much more focused constructivist theory of learning. Based on previous experiences, readers create mental anchors that aren’t necessarily recalled consciously (Bartell, Schultz, and Spyridakis, 2006). These anchors allow readers to quickly evaluate new information; readers utilize these schemes of previously
held beliefs and knowledge in order to fully understand newly encountered ideas and events (Anderson, 1984). Like Piaget’s and Bartlett’s work, the schema discussed in Anderson’s theory create the networks that readers activate or recall as they associate the ideas encountered while reading to what they already know (Ruddell and Unrau, 1994). When the reader finds a “mental ‘home’” for the text she has read in knowledge she already has, she comprehends the text (Anderson & Pearson, 2000). This schema theory becomes an important cornerstone not only for those reading static texts, but those interacting with Internet text as well.

To illustrate this schema theory, Anderson (1984) discussed his work conducted with Steffensen and Joag-Dev as they examined the schema of natives of India and natives of America. Using the prior knowledge of wedding rituals, with which most adults are familiar in their own cultures, the researchers gave participants letters describing American and Indian weddings. In many ways, Indian and American marriage customs differ greatly, creating a situation where comprehension, learning, and memory differ among participants in the study (Anderson, 1984). As expected, the different cultures’ schemas influenced the way they interpreted the situations. According to Anderson’s research, text units that are important in light of the schema are more likely to be learned and, once learned, are more likely to be remembered. The research including American and Indian perceptions of wedding rituals demonstrated this phenomenon as the participants were able to recall more information when it was rated as important by their cultural cohorts (Anderson, 1984).

In other research by Anderson, participants were asked to “pretend” that they were either home buyers or burglars before they read a story about an event that occurs at
one boy’s home while two boys are skipping school (Anderson, 1984). Supporting the schema theory, participants learned more about the information that was assigned to their perspective. Interestingly, those who assumed the perspective of a home buyer were more likely to learn that the house had a leaky roof, whereas those who had assumed the role of the burglar quickly learned that the ten-speed bike was in the garage (Anderson, 1984). Each of the participants used her schema of the assigned role and had a different perspective of the same situation based on that particular role. When readers had a preconceived thought of what they knew about the perspective from which they were reading, they called upon different schema that impacted their understanding of the situation.

Central to the research focused on reading online is Anderson’s delineation of the six functions of schema including assimilation of the text, inferential elaborations to add to understanding, attention to key text elements, application of an orderly search for information, summarization of material, and reconstruction of an original text through inferences despite missing details in memory (Bransford, 1984). Each of these functions works with the others to create understanding of text. The implications of schema theory on learning and especially when it involves reading on the Internet, then, are rather straightforward. Successful reading, whether it involves the reading of an Internet source or a printed text, requires participants tapping into prior knowledge.

When a reader is faced with new information, she must understand the significance of the facts in order to deal with the new situation. This involves the elaboration of details in order to make sense of the context (Bransford, 1984). Bransford (1984) illustrated this characteristic by describing a beginning biology student reading
about veins and arteries, who was then asked to design an artificial artery. According to Bransford, if the reader had simply memorized that arteries are elastic, he would have had difficulty understanding whether or not his model had to be elastic as well. The person who understood the significance of elasticity to the artery would have had a deeper understanding of how the veins and arteries truly work (Bransford, 1984). Readers build their schemata through experiences and without realizing it are able to pull from those memories; in fact, according to Williams (1994), “schemata do not have to be activated consciously; they are brought up without any direct effort on the reader’s part” (qtd. In Bartell, Schultz, & Spyridakis, Nov. 2006).

Obviously, what the reader knows about the subject or remembers a prior event similar to that in which she is participating influences the new situation. Memories allow the reader to construct meaning as she reads, interacting with new material, measuring these new concepts against previously held beliefs. Within the reader’s knowledge of the reading process lie the various aspects of reading represented in her memory. As she reads, she calls upon her knowledge of language, her ability to analyze words, her strategies for processing the text, her metacognitive strategies, the relationships she has with the classroom as well as with her understanding of the world (Ruddell and Unrau, 1994). All of these elements create the reading event, and she depends greatly upon these as she sits down at the computer to read an online article. In order to fully understand the reading material, the schema theory provides the deepest foundation: it allows “an abstraction and conceptual framework for all of the particular events that fall below it but are within its domain” (Ruddell and Unrau, 1994, p. 1475). Schema, however, doesn’t always lend to greater meaning-making. In fact, it may also lend to the loss of meaning
or to the misinterpretations of the reading (Ruddell and Unrau, 1994). For example, when a reader is faced with reading a satirical novel for the first time, her schema may only allow her to read the book in a literal sense, and she struggles with the deeper understanding of the context until she has had a chance to process this new information within and with others, filtering through new information.

In the online environment, the learner has a greater need to construct his own knowledge by evaluating new material in light of prior knowledge (Hein, 1991). The setting is completely different than the static setting of a printed text. It is within the online environment as well that the focus is on the learner rather than the teacher, and the student learns by actively doing rather than passively observing (Thanasoulas, 2002). While the very nature of reading is active, for the reader must interact with the text to make meaning of the words, reading on the Internet poses a different challenge. Instead of simply turning one page to read the next as occurs when one reads a static text, the Internet reader has an unlimited number of choices, deciding which link to select, and each visit to the same web site can bring a new reading event. Schema theorists believe that readers bring to a new situation prior knowledge that must be reevaluated and assessed in light of the new learning event, deepening and demonstrating their comprehension.

**Cognitive flexibility.**

Related to the schema theory, cognitive flexibility, in the simplest terms, refers to the reader’s ability to return to the same material for a different reason and from a different perspective, but at a different time and in a rearranged context (Spiro, Coulson, Feltovich, & Anderson, 2004). Instead of basic surface learning, the learner is able to
learn the concept at such a deep level that she is capable of applying it to new situations. For example, a medical student must learn concepts in multiple ways so that she can quickly apply them to ill patients. Unfortunately, much of the learning that takes place in today’s schools ignores this ultimate goal of learning. Instead, teachers are satisfied with what Spiro refers to as introductory learning, and they rarely ask students to delve into the deeper levels of knowledge, or to advanced knowledge acquisition (Spiro et al., 1991). Educators provide students with structured activities instead of the ill-structured situations most will find themselves in as adults, those situations that require flexibility and adaptations.

At the center of Spiro’s theoretical model is his research surrounding hypertext and it is this research that helped shape the theoretical framework for this particular research project focusing on the Internet reading event. The basis of learning is in the reassembly of previously learned knowledge that the learner adapts to a new situation. What Spiro (1988) and his colleagues identify as Random Access Instruction can address the issues posed by ill-structured learning environments, especially in the nonlinear environment of reading on the Internet. Ill-structured environments are identified as the multi-faceted concepts that contextually interact (Spiro, Coulson, Feltovich, and Anderson, 1988). One of the most frequently used applications of cognitive flexibility occurs within the world of the Internet, to what Spiro refers to as the criss-crossed landscape (Spiro et al., 1991). It is within this landscape that the hypertext provides readers with materials that are quickly re-edited to create a different experience than the last time she visited the site. When a learner enters a document filled with hypertext, and she has choices ahead of her of what to read, as well as how to react and readjust what
she already knows, then the hypertext demonstrates this ill-structured domain. The
domain is something that is always changing, often due to the choices the reader makes
as she is navigating the text. Using hypertext, then, according to Spiro, provides the
learner with “flexible restructuring of instructional presentation sequences, multiple data
codings, and multiple linkages among content elements. It appears straightforward that a
nonlinear medium like hypertext would be very well suited for the kinds of ‘landscape
criss-crossing’ recommended by Cognitive Flexibility Theory” (Spiro et al., 1991, p. 9).
Spiro’s criss-crossed landscape provides a situation that allows two or more readers to
approach the same Internet text with completely different paths, exploring and viewing
pictures, graphics, and other Internet elements in different ways. Ultimately, these
readers of the Internet create their own reading experiences (Spiro and Jehng, 1990).

According to Spiro, Coulson, Feltovich, and Anderson (1988), in order for
learners to enter the advanced knowledge acquisition stage, they must “attain a deeper
understanding of content material, reason with it, and apply it in diverse contexts” (p.
641). Yet, this cognitive flexibility doesn’t simply occur without properly established
learning situations. Too often, when even establishing the introductory level of learning,
the objectives and teaching strategies create a problem for future advanced acquisition.
Through his research of medical students’ ability to learn, understand, and apply new
knowledge, several important phenomenon occur for learners. First of all, learners who
wanted to reduce complex situations relied on an integrated relationship of the ideas, and
for full understanding, the concepts were considered together, not separately. Spiro
termed this characteristic as reductive bias and it includes the “oversimplification of
complex and irregular structure, overreliance on a single basis for mental representation,
overreliance on ‘top down’ processing, context-independent conceptual representation, overreliance on precompiled knowledge structures, rigid compartmentalization of knowledge components,” and the “passive transmission of knowledge” (Spiro et al., 1988, pp. 642-643). As the field of Internet reading expands and provides teachers with important information about what occurs during the reading of online material, teachers will be better equipped to create learning situations that develop knowledge at a deeper level.

Adding to the theoretical understanding of what occurs in the cognitive elements of reading, Rand Spiro, Bertram Bruce, and William Brewer (1980) have edited a collection of important research in the field of reading comprehension. Examining what influence comprehension, the text has been organized in several parts: global issues, text structure, language, knowledge or world and inference, effects of prior language experience, and comprehension strategies, facilitators, and instruction. Obviously, reading involves more than the simple decoding of words. It is, in fact, a complex process that has the ultimate outcome of creating meaning from a text. Reading involves a variety of fields of research including psychology and education. Experts hold common beliefs about reading: reading is an interactive event that occurs on a variety of levels. The reader also brings prior knowledge to the reading event. Reading is also inferential and constructive as the reader takes what she knows already about the text and what she learns through the reading event as she incorporates the two. Finally, readers must use strategies when reading, being flexible with what they already know, monitoring their own comprehension as they read (Spiro, Bruce, & Brewer, 1980).
Reading comprehension, in general, is multilevel, interactive, and hypothesis-based (Spiro, Bruce, & Brewer, 1980). A reader must use knowledge from a variety of levels as she participates in the dynamic nature of reading, and in the process she develops hypotheses that she must evaluate and monitor during the reading process. In many ways, the reader’s perception influences her understanding of the content. Based on her prior knowledge, the reader creates a hypothesis about what she is reading and she checks that hypothesis as she monitors her reading. Sometimes, however, a reader’s hypothesis may be wrong, and the reader finds herself in a state of limbo, waiting for more information to clarify her misunderstanding or corroborate what she knows. Skilled readers depend on a complex model of understanding, including perceptual, linguistic, and cognitive processes (Spiro, Bruce, & Brewer, 1980). Each of these processes not only influences its own area, but each supports the other in the process of comprehension. However, as a way to underscore the importance of the reader’s formation of hypothesis as she is reading, schema adds to the reader’s perception (Rumelhart, 1980). The schemata a reader possesses contributes an accurate perception, but it can also create a distortion in understanding. Sometimes the reader does not have appropriate schemata and as a result, she simply cannot understand what the text is saying (Rumelhart, 1980).

The connectedness of text which “emphasizes the distinction between texts and unrelated collections of sentences or lists of words” also works into the cognitive flexibility theory by showing that construction of a more interconnected memory is easier to create and easier to retrieve (Goetz and Armbruster, 1980, p. 203). Goetz and Armbruster (1980) pull from the work of Levin (1970) to illustrate this point. Levin’s research of fourth-and fifth-graders studying word lists embedded in sentences that
created a story were able to recall them more quickly than those words placed in twelve unrelated sentences. When the ideas are connected, memory is easier because the mental processing occurs at a deeper level. Another important element of connected text is the relationship it has with prior knowledge. Supporting the premises of the schema theory, research cited by Goetz and Armbruster demonstrate that texts are much more difficult to learn and remember when prior knowledge is limited.

Spiro’s work with the cognitive flexibility model builds on the previously discussed schemata theory and provides strength to understanding that meaning exists in the reading process. While the words, sentences, and paragraphs are important to the structure of the text, they only create a skeleton for meaning. Instead, the reader brings to the skeleton her prior knowledge and beliefs as well as her understanding of the reading process, influenced by the context of the reading, known as “construction” (Spiro, 1980). Obviously, construction is the interaction of text and a variety of contexts (Spiro, 1980). Through construction, what a reader comprehends and remembers includes the message that is directly stated as well as what occurs as a result of that information.

This construction, though, is much more complex than the theories of constructivism or even the more specific schema theory. Instead, it incorporates a complex webbing of ideas about schema including how is schema developed or acquired, how does the reader choose the knowledge or even have access to her prior knowledge, how does the reader support and change her schema, how does the reader maintain the schema she possesses, how does she combine her schema, and how does she analyze all that she is learning in light of all that she knows. While Spiro’s work was written nearly
four decades ago at the onset of the technological explosion, his theory is quite timely and appropriate to the work of online reading comprehension.

While the perception of the reader and the structure of the text is important, there are other key elements of reading comprehension that lend themselves to the study of online reading strategies, and one of the most important elements of this is the influence of strategies. According to Vygotsky, development of knowledge first occurs automatically as unconscious acquisition and then it gradually increases as the learner consciously controls that knowledge (Brown, 1980). The importance of metacognition is that the learner understands her knowledge; in other words, the learner is conscious about what is occurring cognitively while she is completing a learning activity. Because the goal of reading is to achieve understanding, much of educators’ focus has been on teaching strategies explicitly taught to readers in order to help them navigate the context of reading. These effective reading strategies have included monitoring, checking, and self-testing, and even more specifically, identifying the reading’s purpose, identifying the most important elements of the text, focusing attention on the important details, monitoring comprehension, fixing errors when comprehension isn’t occurring, and recovering from the distraction (Brown, 1980).

Important to the research of online reading, metacognition allows readers to understand different aspects of the reading event, producing a more efficient reading experience. Readers must understand what they need to know, and this occurs when they develop a purpose for themselves. According to Brown (1980), grade-school children often have trouble estimating that some tasks will pose more difficulty than others. For example, children often can’t distinguish between the ease of learning a story to simply
obtain the gist or to be able to recall the story verbatim (Brown, 1980). By the fifth grade, however, these students are aware that some tasks are much more difficult than others. In other research, children must be able to find the main idea of a passage. Children as young as six-years-old are capable of determining the main idea of simple pictures (Brown, 1980), but when given more complex and more lengthy passages, even more advanced readers have trouble determining the main idea. When this idea is applied to online reading situations, the problem will be compounded even further for the reading environment of the Internet is nothing like that of a linear text.

In examining the works included in Rand Spiro’s (1980) compilation of contributions to the field of reading in his text *Theoretical Issues in Reading Comprehension: Perspectives from Cognitive Psychology, Linguistics, Artificial Intelligence, and Education*, researchers agree on the importance of structure of text to the overall comprehension (Spiro, 1980). The key idea to this characteristic is that text provides the tool for communication, an important element of linguistic theory. It is in the structure of the text that the ideas of schema and linguistic knowledge interact. Language is used to create poetry, but to also understand traffic signs (Spiro, 1980). An important aspect of this theory is that simply because a piece of text is coherent, it does not imply that the text is coherent. There are other properties that make the text coherent (Spiro, 1980). These properties include cultural differences as well as more “local difficulties” such as linguistics (Spiro, 1980). Readers have to be able to manipulate their skills and their prior knowledge as they navigate a variety of reading materials, whether those documents are static and linear or whether they are constantly changing with each click of the mouse.
Elements of text that can influence a reader’s comprehension include syntax, structure, and grammar. In order to understand the text, the reader must have a solid understanding of the complex nature of writing. Beginning readers cannot fully comprehend the nuances in advanced writing, nor can they comprehend even complex sentences. Pragmatics, or the messages implied, create problems for beginning readers who are not capable of reading meaning into words unless explicitly indicated. Because the writer cannot provide nonverbal or verbal hints, the reader must infer what the author intends (Spiro, 1980). Perhaps this is where the importance of the text and its supporting material come into play (Spiro, 1980). For young children who have not yet established pragmatic understanding, they may rely on pictures or illustrations (Spiro, 1980). In fact, “illustrations may depict up to 40% to 50% of the content of the story” in children’s books and some children’s books make the illustrations an important part of the story (p. 136).

Illustrations such as pictures, graphs, and other graphic elements play a huge role in the format of Internet sources. In fact, online readers rely a great deal on the colorful graphics that litter the web pages. Previous researchers have debated the importance of pictures in the comprehension process; many researchers have indicated that the pictures play a role in the understanding of the text, while other researchers have claimed that the pictures have no impact on the understanding and may even interfere with the reading process (Lemonnier Schallert, 1980). In an interesting study conducted by Lemonnier Schallert and her colleagues, fourth-grade students were assigned to one of two groups asked to read a detailed description of how faucets use valves to control water flow. Some were asked to read a non-illustrated passage, and others were asked to read an
illustrated passage. Those reading the passage with illustration performed better on a multiple-choice test and free recall test (Lemonnier Schallert, 1980), demonstrating the impact illustration can have on a person’s comprehension. When placed in the context of the Internet that often provides readers with a variety of illustrations, this may play an important role in reading in this environment.

Summary

With the complexity of reading and the rapid changes in technology, those involved in the field of reading research are not surprised that researchers are just beginning to focus on the Internet’s influence on the strategies one uses to read in that environment. This research project focused on a sample of convenience which included a small population of sixth-grade readers with different reading abilities as they read online articles; the sole purpose of the project was to examine whether the reading strategies they used while reading Internet articles paralleled those strategies the field of reading has accepted for static texts.

One cannot ignore the increase of Internet access in both homes and schools over the past decade. With more than over three-fourths of all adolescents using the Internet, attention must turn to the impact this technology might have on students’ learning, and even more specifically on their reading. Interestingly, though, despite the increased dependency on the Internet, literacy education still focuses on traditional static texts, and often a false assumption is made that reading strategies that apply to static texts can simply be used with Internet texts. Initial research in Internet reading indicates that differences between these two types of texts do exist, especially when one considers the interactive and ever changing characteristics of hypertext.
An accepted list of universal reading strategies has been established by years of research focused on students reading static text. Actively engaged in the reading process, capable or successful readers preview the text to tap into their prior knowledge and they stop frequently to monitor their understanding. According to Pressley and Hilden (2004), they have identified 31 of these strategies that emerge in verbal protocols; they have divided this list into strategies used before reading such as creating a goal for reading as well as skimming the text, during reading such as reading only those sections the reader believes to have important information, and after reading including summarizing the text and reflecting on the information read. These accepted reading strategies provided the researcher with a base to which she could compare the strategies that emerged while the participants were thinking aloud as they read Internet web sites.

Finally, two important theories formed the framework for this project: schema theory and cognitive flexibility. The schema theory, expanded by R.C. Anderson, builds upon Piaget’s work, and it provides a foundation similar to constructivism. When examining the schema theory in the context of reading the Internet, the reader approaches the reading situation based on her previous experience with reading. Because each reader has a different experience, she approaches the reading event with a different expectation. Cognitive flexibility incorporates these previously discussed theories and applies them to the learning environment. This particular theory emphasizes the application of knowledge to new learning experiences and fits well with this study’s examination of readers approaching web sites for the first time.

This current research project used these theories to provide insight into what strategies sixth-grade readers of varying reading abilities use when they read on the
Internet. While much is known about reading static texts, little is known about how reading on the Internet compares to reading static texts. Researchers who have delved into this aspect of reading have indicated possible differences based on the characteristics of hypertext. Internet readers have full control over the direction of reading. Instead of turning a page, they click on a picture or word that takes them on a different tangent than their reading requires. Incorporating these theories, the researcher hoped to explore the strategies that emerge in this type of reading environment.
Chapter III: Methodology

This chapter will describe the methodology used to design the study as well as the procedures used to collect the data. Additionally, this chapter will describe the data analysis methods used to identify, categorize, and explore the reading strategies that sixth-grade students of varying reading abilities used when answering questions by reading Internet sources.

Restatement of the Purpose of the Study

After several decades of research, the field of reading has identified a set of reading strategies used by successful readers of printed text (Paris, et al., 1991; Pressley & Afflerbach, 1995; Pressley, 2002), even distinguishing strategies for different genres. Typically, readers of printed text look at the text before reading, set goals, predict, monitor understanding, formulate questions about the text, and make inferences about the content (Pressley & Afflerbach, 1995; Pressley, 2002; RAND Reading Study Group, 2002; Thompkins, 2003; Pressley et al., 1989). Researchers have also indicated a difference in strategies used for reading fiction, non-fiction, and informational texts. When students read informational text, such as their textbook, they rely on four primary processes: tapping into prior knowledge, making inferences, self-monitoring their understanding, and finding motivation from the affective elements of the text such as pictures and graphs (Pressley, 2002; Pressley & Afflerbach, 1995). These non-fiction reading strategies have solid connections with the identified strategies for reading fiction, and yet, researchers acknowledge a difference between strategies needed to read these different genres.
While researchers have corroborated these identified reading strategies of static text regardless of the genre, they have not adequately addressed the strategies used by readers of the digital text such as that found on the Internet. Even though differences exist between genres, it is uncertain whether individuals reading Internet text simply apply the aforementioned strategies, use a different set of strategies, or employ additional strategies. Early research has indicated the possibility of variations in the strategies of reading Internet sources. For example, Hill and Hannafin’s (1997) work with adults indicated that besides the readers’ prior knowledge, how the adults felt about themselves and their reading abilities impacted their stance towards the Internet text. Other research associated challenges for readers of Internet texts that may not exist in static text such as using the wrong or inappropriate search engines, losing direction in their navigation of the web site, and not paying attention to the questions they are investigating (Coiro & Dobler, 2007). Based on work by other researchers which underscored the differences in traditional text and Internet text, such as structural problems like a lack of page numbers and no table of contents or indexes, other researchers have implied that “readers cannot apply text structure schemas to navigation within a hypertext system” (Waniek, Brunstein, Naumann, & Krems, 2003). Waniek et al.’s (2003) work suggested that the ever changing format of the Internet’s reading environment created interesting differences for readers. Therefore, classroom teachers and other stakeholders cannot assume a transfer of strategies and skills from reading static text to reading Internet sources; for obvious and logical reasons, further research in this area is required to meet the needs of twenty-first century students.
As already discussed, successful readers incorporate reading strategies that allow them to interact easily with the text and comprehend the author’s message. These strategies include self-regulating, making predictions based on prior knowledge, asking questions, seeking clarification, creating images, and monitoring one’s own reading comprehension (Pressley et al., 1989; Hilden & Pressley, 2007; Cakir, 2008). As stronger readers, they understand the literal meaning of the text and they can make inferences at the same time (Snow et al., 1998). These successful readers also monitor whether or not they understand what they are reading; ultimately, they assess their own level of understanding, and they quickly use corrective strategies to fix their reading when they do not understand the text (Snow et al., 1998). Ultimately, the readers’ inabilitys to interact with text separate skilled readers from unskilled readers (Cakir, 2008). Researchers interested in distinguishing differences between skilled and unskilled readers have long understood the importance of metacognitive awareness (Mokhtari & Reichaad, 2002), because skilled readers understand their thinking, and they use a variety of strategies. Unskilled readers, on the other hand, tend to rely “heavily on the textual information itself...or are stuck into a preconceived schema even if incoming clues provided by the text contradict it” (Cakir, 2008, p. 70). Understanding differences in readers provides crucial foundational information to the field of reading. While this particular study did not focus on the differences in skilled and unskilled readers, this information did play a role in understanding some of the behaviors the participants exhibited. Most importantly, these characteristics of skilled readers influenced the researcher’s decision to not exclude readers based on their level of reading success. If
researchers can understand these differences, perhaps they can begin to suggest instructional methods to classroom teachers focused on meeting the needs of all students.

Researchers who have focused on pre-adolescent or adolescent Internet readers have tended to focus on skilled or above-grade level readers. Quite simply, researchers have focused attention on skilled students primarily because these readers use a variety of strategies successfully when reading traditional static texts. Admittedly, when Coiro and Dobler (2007) observed eleven sixth-grade students navigating the Internet during an online reading activity, they selected their participants based on high standardized test scores in reading coupled with high academic grades in reading and experience using the Internet; they used skilled readers because these types of readers read a variety of genres with a bigger range of reading strategies (e.g., Pearson et al., 1992). During participant selection for this current research project, however, the researcher made a conscious decision to not exclude participants based on their reading abilities. Test scores and grades were eventually collected after the researcher had started to analyze the data, but they were not an important part of the process. They were only gathered after the researcher had completed the sessions with the participants. The researcher decided against this limitation in order to give a more encompassing perspective of Internet reading strategies the participants used and a more authentic view of students in a typical American classroom. Every day, classroom teachers face the challenges of teaching students with extreme differences in their skills, and they must differentiate their instructions according to the students in their classrooms. A study examining what might occur when those students read online materials needed to not limit the participant pool to only successful readers, as most teachers do not have exclusively successful readers as
students. Instead, they must meet the students where they are in their reading abilities and move them forward as the year progresses. Understandably, researchers in the past narrowed their focus to skilled readers; however, for this study, the researcher recognized an area of research missing in Internet reading and chose to include participants without considering their reading skills.

Researchers must extend their research focus to include reading on the Internet, for initial research has indicated that the schemata a reader brings to the Internet reading event may matter more than ever. This type of research must also include a variety of readers in an Internet reading event in order to begin to sort through the relationships between reading strategies used when reading online. With this in mind and building on a theoretical framework of schema and cognitive flexibility, the researcher designed a study that explored the Internet reading strategies used by the five sixth-grade students. The themes that emerged from the analysis of the transcripts and researcher’s field notes allowed the researcher to consider how these five pre-adolescent readers approached the reading environment of the Internet.

**Research Design**

**Overview of research design.**

When designing the study, the researcher wanted to conduct an intensive examination of the reading behaviors children use when reading on the Internet, so she selected a qualitative approach. Undoubtedly, larger studies that include scientific samples and standardized measurements that allow the researcher to apply generalizations to larger populations are often costly and time-consuming (Anderson, 2008), and many researchers, especially at smaller, private institutions, do not have the
luxury of large budgets and release time for research. Researchers do have other options, however. According to Anderson (2008), researchers can turn to qualitative methods when the issue is not well-defined or understood and when the indicators are unclear as was the case with this investigation of the strategies readers use when reading Internet sources. Within the context of examining the types of research methods related to technology, Anderson (2008) organized the different approaches into goals and the methods used to meet these goals. One of his tables (3.6) listed the qualitative and quantitative approaches as methods; these qualitative research methods, then, provided a foundation for the design of this particular study: a case study interpreting data analyzed using grounded theory.

Table 1

Anderson’s (2008) Table 3.6: Goals of Qualitative and Quantitative Research

<table>
<thead>
<tr>
<th>Goals of Qualitative and Quantitative Research</th>
<th>Exploration</th>
<th>Theory/ hypothesis generation</th>
<th>Assessment and monitoring</th>
<th>Impact studies and evaluations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualitative Research: Observation and Interviewing</td>
<td>Case studies</td>
<td>Grounded theory</td>
<td>Constructed response coding</td>
<td>Formative evaluation</td>
</tr>
<tr>
<td>Quantitative Research: Surveying and Assessment</td>
<td>Pilot or field testing</td>
<td>Causal theory building</td>
<td>Traditional and online assessment</td>
<td>Summative evaluation</td>
</tr>
</tbody>
</table>

With the goal of exploring Internet reading strategies, the researcher chose to use grounded theory as the foundation of her study and incorporated the analyzed data into case studies to provide a narrative description of what had emerged during the data analysis. During three different sessions, she observed and videotaped readers in the familiar setting of the reading on the Internet; the qualitative nature of this study allowed the researcher to consider a more limited snapshot of the reading process instead of a
broad picture. Participants were asked to complete a think aloud session (Afflerbach, 2000) as they conducted the search of the Internet sites. Grounded theory allowed the data to be categorized into themes, and the case study provided the vehicle for telling the stories of the individual readers, giving them the personal descriptions the researcher sought. Hitchcock and Hughes (1995, cited in Cohen, Manion, & Morrison, 2000) indicated that the case study method would allow the researcher to create a narrative that relayed the important details of her study; successful case studies create a relationship between emerging themes and the researcher’s analysis. Therefore, in this situation, the case study design allowed the researcher to explore the reading strategies that surfaced during the Internet sessions, and ultimately, it provided the researcher with a way to examine the reading behaviors of the five participants, giving her the opportunity to discuss her analysis in a personal format. Acknowledging the complexity of the reading process, the researcher knew that fully understanding what happened in the readers’ minds during the process was difficult and perhaps impossible. However, this current qualitative design provided the researcher with a chance to holistically view the decisions and thoughts the readers used as they explored Internet sites for answers to the researcher-posed questions.

The researcher used five participants, three boys and two girls, from a pool of 109 sixth-grade students at a Midwest intermediate school that housed the rural school corporation’s fifth and sixth-grade departmentalized classes. Upon receiving approval from the school corporation superintendent, the building principal, the classroom teacher, and the Internal Review Board (IRB), the researcher sent letters home to the parents/guardians of each of the 109 students. With administrator and parental approval,
the researcher also visited each of the reading teacher’s reading classes. During the ten minute presentation to the students, the researcher explained the purpose of her research project as well as what selected participants would be asked to do at each of the sessions. She verbally illustrated what would happen when the participants came to the office suite at the college, explaining that the sessions were to help teachers figure out what kids do when they read online. The researcher also emphasized that there would not be a right or wrong way to do the activities and that the participants would not be graded, and she emphasized that if the participant wanted to stop or not finish the Internet sessions, s/he had that option. This explanation was designed to alleviate the fear that potential participants might have had about working with an unfamiliar adult in a situation they most likely had never experienced. During this brief classroom presentation, the researcher carefully read through the questionnaire that she asked each of the potential participants to complete. At this point, she explained the Likert scale they would use to assess themselves as readers. A one on the scale meant that they were not good at the statement, a three meant they were good, and a five meant they were excellent. A two on the scale would indicate that they fell somewhere between not good at all and good; a four meant they were somewhere between good and excellent. The researcher felt it was important to make these distinctions in case potential participants were unfamiliar with this type of rating. Following the presentation, each of the potential participants received printed details about the research project and the questionnaire. The material sent home also included a consent form that enabled them to participate in the project. Potential participants were asked to return the consent form to their classroom teacher within one week after the researcher’s introduction to the project.
A week later, the researcher met with the classroom teacher to explore which students had demonstrated interest in the research project. Together, the researcher and the classroom teacher discussed the nine returned consent forms. Using the questionnaire responses and the classroom teacher’s anecdotal comments about each student’s reading ability, the two created profiles of the volunteers. In order to give more insight into the classroom teacher’s observations and anecdotal information, she did discuss the potential participants’ winter scores on the Northwest Evaluation Association (NWEA) standardized assessment. However, as previously mentioned, these scores only provided a detail about the participants, and were not used in determining whether or not the participant could participate. One of the volunteers was not selected because of behavioral problems and low responses on the questionnaire, responses indicating he would not work well with the researcher or be able to articulate his thought processes.

When the researcher left the meeting, she had eight potential participants.

In the week that followed, the researcher contacted the guardians or parents of each of the students who had returned the consent form. After discussing on the phone the parameters of the research, three of the potential participants withdrew their names from consideration. One was no longer interested in helping with the project, one had transportation problems, and the third indicated her child was too busy with extra-curricular activities and school work to participate in the research project. Ultimately, the researcher selected five participants. The researcher, her faculty advisor, and the classroom teacher believed a pool of five participants would give her a good picture of what happens when different types of students read articles on the Internet. With the
parents’ help, the researcher scheduled individual sessions at her office suite located on a college campus in the participants’ hometown.

Each participant met three separate times for one-on-one sessions at the researcher’s institution, a small, liberal arts college in the Midwest. During these sessions, the participant used a predetermined web site chosen by the researcher to locate the answers to questions the researcher had designed. The first session involved a web site that explored Ancient Egyptians, the second session used a web site focused on the Soviet Union, and the third session included a web site examining the climate. To provide authenticity to the current research project, each of the web sites was selected because it corresponded with a sixth-grade academic standard identified on the state’s Department of Education’s website. For example, when participants were asked to interact with an Ancient Egypt web page during the first session, the selected web site and questions related to the Indiana social studies academic standard 6.1.1, Early and Classical Civilizations: 1900 B.C./B.C.E. to 700 A.D./C.E. Describe the rise; the political, technological and cultural achievements, and the decline of ancient civilization in Europe and Mesoamerica. All three of the topics selected for the reading sessions were topics the sixth-grade social studies classes had discussed and that were included as chapters in the social studies textbook the participants used.

During each of the individual sessions, the participants were asked to think aloud while they looked for the answers to the questions. The think aloud protocol established by Afflerbach (2000) was used throughout the sessions, and aided the researcher in having a snapshot of the thought process of these readers. They were able to look for information in any order, but they could not leave the web site. The researcher chose to
impose this limitation because it would help her see the strategies on which the readers relied in a reading environment more parallel to the reading of a textbook. The focus of this project was not on how students research a topic, but rather how they read an Internet site. When students are given questions to answer from their textbook, teachers expect them to stay within the confines of that one textbook’s printed pages. To resemble this typical learning activity, the researcher decided to limit participants to the parameters of one web page, asking participants to not navigate outside the web site she provided.

Because the project relied on the think aloud process, if the participants were silent for more than ten seconds or gave incomplete responses, the researcher reminded them to think aloud. The researcher also asked clarifying questions if the participants did not elaborate on their thoughts. While the sessions were in progress, the researcher videotaped the computer screens, which captured the voices of the participants. She also kept detailed field notes as she observed the participants from a chair located to the side of the desks out of eyesight of the participant. Her goal throughout these sessions was to remain as unobtrusive as possible. As a backup, the researcher used the screen capturing program called Camtasia. However, as she worked through the field notes and transcripts of the videotaped sessions, she only had to refer to it a few times during data analysis.

**Grounded theory.**

To analyze the transcripts of the videotapes and field notes of the Internet reading sessions, the researcher used grounded theory, a theory developed by sociologists Barney Glaser and Anselm Strauss (Strauss and Corbin, 1998). Indicative of grounded theory is the belief that patterns emerge from the data, providing the researcher with an explanation of a situation (Strauss and Corbin, 1998). Instead of starting the research
design with a theoretical framework that influences the direction of the research or data, the researcher implementing grounded theory examines the collected data and allows the theory to evolve; in fact, the use of the word grounded indicates that the ideas surfacing from the study come from or are “grounded” in the collected data, not other people’s theories (Leedy & Ormord, 2005); therefore, it was crucial that the researcher approach the study with as little bias or theoretical preconception as she could. According to Strauss and Corbin (1998), qualitative researchers using the grounded theory “must learn to listen, letting the data speak to them. They must learn to relax, adopting a more flexible, less preplanned, and less controlled approach to research” (p. 59). This concept of relaxing and allowing the data to speak for itself is difficult for researchers, for it requires patience and time, and faced with these challenges, some experience frustration. Leedy and Ormrod (2005) warn that some researchers see these grounded theory steps as too prescribed or rigid, so much so that they “limit a researcher’s flexibility and may predispose the researcher to identify categories prematurely” (p. 141). With this in mind, the researcher entered the study conscious of this warning. For this researcher, it also required her to set aside what she already knew about reading of traditional texts. As an instructor of reading at her institution, this, perhaps, was one of the greatest challenges. She had to work to not make assumptions, but just like all people, the use of traditional reading strategies was a firmly rooted part of her schema and separating that from her memory was impossible. Using this theory, the researcher worked hard to not enter the study with a narrow research focus; instead, she allowed the data to unfold and to provide direction to the study. Therefore, for this particular research study, the researcher could not predetermine the categories; instead, she closely examined the transcripts of each of
the Internet sessions, in order to see if patterns emerged with regards to strategies used by sixth-grade readers of the Internet.

During the analysis of the data, each session was examined separately, and the researcher focused on only one participant at a time. At first, the researcher read through the transcript and field notes for the individual simply to get an overall feeling from the data. Next, the researcher examined the notes and transcripts, making references to a behavior each time the reader changed directions or made a decision. Grounded theory leads “to the emergence of conceptual categories. These concepts/categories are related to each other as theoretical explanation of the action(s) that continually resolves the main concern of the participants in a substantive area” (Grounded Theory Institute, 2008).

According to Graue and Walsh (1998), this part of the process provided the researcher with “a label that says that the researcher thinks that his excerpt of data is an example of this idea” (p. 163). The best way to develop these labels was through multiple readings of the field notes and transcripts (Graue and Walsh, 1998). The researcher began first with the classification of the data or open coding. In this open coding of the data, the researcher wrote descriptive words or phrases that suggested the behavior in which the reader was participating. She wrote these descriptive phrases or labels on the copies of the field notes and transcripts, and they included words such as “cannot locate information,” “scrolled quickly,” “scrolls up to left of the page,” “clicked on Akhenaton,” and “moved cursor under words.” Other phrases included descriptions of the participants’ responses such as “clear direction for navigation” or “repeated question first.” As the participant changed directions in his/her reading of the web page, the researcher labeled the action or behavior. Each of the labels provides information about
the context, or situation, in which it occurred (Strauss and Corbin, 1998). She then used this information to narrow the behaviors into categories.

Once the researcher initially labeled the actions in the transcripts and field notes, she then began the next stage of analysis. At this point, the researcher looked at the many labels she had written in the transcripts and field notes, typing the categories and cutting apart the papers. This provided the researcher with a visual representation of the data. Reading each of the labels carefully, she looked for themes or categories that emerged. Strauss and Corbin (1998) believed that this point of the analysis was important because grouping gives the researcher fewer units to analyze. Those ideas then were grouped into categories that represented the phenomena occurring during the sessions. Some examples of these preliminary categories were “surfing,” “unclear direction,” and “asked for help.” After creating those categories, the researcher read the transcripts and field notes again, using the new labels and looked for new or different labels. From there, the researcher again examined the labels, categorizing them by like characteristics. Through the analysis, several categories emerged quickly such as “navigating,” formerly referred to as “surfing,” but other labels such as “random thoughts” or “inappropriate comment” posed a more challenging situation for the researcher. Eventually, labels such as these were categorized as “off task behavior.” While grounded theory required the researcher to approach the analysis of the data without preconceived assumptions, the researcher did consult an outside source once she had categorized the labels. At this point, the researcher compared her discoveries to those themes found by other researchers in the field of reading particularly the work of Pressley and Afflerbach (1995), selected because of their seminal research in reading. Their important work has added to the research base used by
school corporations to develop their reading curriculum. Other researchers have corroborated their findings, strengthening the importance of their investigations for educators and for reading researchers. The researcher consulted this source because she felt it would provide a more parallel analysis of the reading sessions recorded for the five participants with already accepted reading research, research focused on the reading of traditional static text, especially since she had strived to create a reading scenario as closely related to static textbook reading as she could. With similar labels, a better picture of the relationship between the reading events of reading static text and reading Internet sources emerged.

Grounded theory was important to this study because it recognized that differences exist between individuals as they construct meaning in different contexts (Strauss and Corbin, 1998). Also important to this study was the idea that hypothesis was not appropriate for the research design; instead, the researcher wanted to explore the strategies that readers used in the reading environment of the Internet, a research problem that focused on a situation typically found in education (Punch, 2009). Through careful examination of the questionnaires, the field notes, the transcripts of the Internet sessions as well as consultation of the screen captures when needed, the researcher identified the variables and examined the relationships between them (Borgatti, 1996). Of utmost importance to the validity of qualitative research conducted in grounded theory is “theoretical sensitivity” or the researcher’s ability to see variables and their interrelatedness (Strauss and Corbin, 1998). A study rooted in grounded theory allowed themes in the reading strategies used by sixth-grade readers of varying abilities to read Internet sources to emerge.
Case study.

The case study is a common qualitative research design method, and it allows the researcher to study an individual or event with great attention during a specific time period (Leedy & Ormrod, 2005). With five individual participants who each offered an interesting picture of what occurred while they were reading on the Internet, the researcher decided to use a case study which allowed her to compare the different cases, especially when two distinct groups of Internet readers emerged in the data (Leedy & Ormrod, 2005). In a case study, the researcher collects data on the participants thorough a variety of methods such as observations, interviews, documents, past records, or audiovisual methods such as videotapes or audiotapes (Leedy & Ormrod, 2005). This researcher used transcripts and field notes from the videotaped sessions as well as self-reported feedback from the participants on their questionnaires. With these three data points, the researcher provided triangulation. Part of the decision making process to use this design was the researcher’s acknowledgement that generalizations could not be made to larger groups of children. Instead, future research would need to be done; however, the collective case study provided the researcher with an important way of describing the research process and the information that surfaced.

Participant Selection Procedures

Because of the proximity to the researcher’s college institution, a local elementary school in a rural, Midwestern town was used in this study. Acknowledging that this was a sample of convenience, the researcher did not assume that the sample represented a larger part of the population (Marshall & Rossman, 2006). Researchers often choose this method of sampling because it requires a smaller financial investment (Kemper,
Stringfield, & Teddlie, 2003, p. 274), and like many other researchers, this researcher had similar financial constraints; the researcher’s involvement in the educational community enabled her to use the established working relationship with the classroom teacher, the building principal, and the school superintendent for this study. All administrative stakeholders and the classroom teacher welcomed the researcher. The researcher had access to the classrooms for distributing the parental consent forms and, when she needed it, she had the information she needed regarding previous academic performance of the participants, as well as access. While there are limits to using a sample of convenience, it is one of the most popular of the purposive sampling techniques (Kemper et al., 2003). Because of the researcher’s location and limited budget, this sample served her research purpose quite well.

**Consideration for participation.**

Several considerations were given to selecting participants for this study. First, the researcher believed looking at a smaller group in an in-depth manner would provide a better picture than a broader look at a larger group of readers. Second, the researcher chose not to focus on one type of reader, and she chose not to limit her selection to just skilled readers. Third, sixth-grade students were selected because of their ability to articulate what they are thinking as well as their familiarity with informational text on the Internet. Finally, participants who were comfortable working with a researcher were selected because of the requirement for the participant to think out loud.

After giving the students one week to return the parental consent forms, the researcher created the participant pool from those who returned the form. Through an informal, self-report survey conducted by the school’s technology specialist, nearly
seventy-four percent of the sixth-grade students had identified that they have Internet access at home (Thompson S., personal communication, January 13, 2009), indicating the majority of the participant pool would have a typical comfort level with technology. One teacher, a fifteen-year veteran of the classroom, provided reading instruction for all of the sixth-grade students, and had already assessed the students’ reading abilities through literature circles, one-on-one conferencing, classroom discussions, and the NWEA fall and winter tests. The classroom teacher played an important role in the participant selection process, for she corroborated whether the test scores matched the students’ reading performance in class. In a few cases, the classroom teacher indicated she thought the participant tested better than his day-to-day reading ability indicated. She was also able to indicate which students she believed would be most comfortable speaking with the researcher. Besides the teacher recommendation, participants were selected based on the following criteria: (1) parental permission with student consent (Appendix A) and (2) student questionnaire (Appendix B). Standardized test scores on the fall and winter NWEA tests identifying the participant’s reading level were solicited after the participants completed their sessions with the researcher. She included them in this project to provide a richer picture of the participants. They represent one more piece of information defining who the participants are as readers.

*Sixth-grade readers.*

The researcher selected a sample of convenience of sixth-graders for her research not only because of the proximity of the participants, but also because they possessed characteristics desirable for the research project. By the time students entered the sixth grade, they had received instruction in phonics, recognizing sight words, decoding,
making inferences, and reading comprehension strategies. Academically through the school corporation’s adopted curriculum, they had transitioned from specific instruction in how to read to reading content-specific textbooks, reading information on health, science, or social studies related content (Reading Curriculum Guide, 2008; Biancarosa & Snow, 2006). Furthermore, they were able to respond to the Likert-scaled questionnaires and to verbally articulate their cognitive processes as they read online articles. During middle childhood, a gradual increase occurs in logic, memory, and learning strategies, as well as in the ability to learn by talking with others (Blume & Zembar, 2007), and they possess the ability to talk about their reading strategies (Pressley & Afflerbach, 1995). Finally, the sixth-graders selected for this study also had previous opportunities to learn how to use the Internet by either reading web sites or interacting in the social elements of the digital world in online games or social networking. In a variety of ways, these sixth-grade readers reflected the theoretical frameworks for this research, for they were social creatures and had learned through their reading curriculum about consciously making connections to prior knowledge. At this point, building on their schema as they searched for information on the Internet often occurred without thinking about it. Also important and a reason for selecting this grade level of participants was that for the past few years teachers have asked them to use the Internet to search for information both in school and at home (Becker, 1999). Each of these characteristics was crucial to the research in this particular study. Because the researcher asked participants to think aloud during the Internet reading event, it was important that the participants feel comfortable talking about what was going through their minds while reading online articles. Typically, children do not practice think alouds so the researcher needed
participants who would feel comfortable performing such an unfamiliar task. Pressley & Afflerbach (1995) indicated that different types of readers will use different ways to describe their thought processes. With this in mind, the students were asked to complete an initial questionnaire before participating in the study which asked them to rate their comfort level when talking with a researcher about what they were thinking. While this did not ensure fully verbal participants, it did allow them the opportunity to think about their comfort level with an adult they did not know and to consider what the researcher would ask them to do during the sessions. The answers they provided on this questionnaire, along with teacher feedback, allowed the researcher to select a sample willing to think out loud with the researcher.

*Reading ability.*

Reading behaviors of different levels of readers added to the understanding of how pre-adolescents read Internet texts, because the typical classroom contains a wide variety of readers. Focusing on one type of reader would have limited the researcher’s understanding of what occurs in a traditional setting. Early in the project, the researcher decided not to identify the reading levels of the participants. Instead, she consulted the test scores following the sessions simply to give a better picture of the participants’ academic performance. The school corporation from which the participants came used a variety of ways to assess their students’ reading levels. For early childhood classrooms, teachers use running records and phonemic awareness and sight word tests. As children gain fluency and comprehension skills, students complete Accelerated Reader tests as well as STAR assessment test. Students complete these tests online. Some classrooms in this school corporation use the Rigby benchmark to establish understanding of the
students’ reading levels. Classroom teachers also receive feedback on students’ reading skills through the ISTEP standardized test taken in the spring as well as from the NWEA (Northwest Evaluation Association) standardized test, which this school corporation choose to administer three times a year. Because the NWEA (Northwest Evaluation Association) test provides parents and teachers with a much more developed picture of a student’s reading skills, the researcher chose this standardized test as an identifier of reading levels rather than the ISTEP standardized test which provides a different set of information about specific reading skills. After the trimester grading period ended, the classroom teacher provided the participants’ reading grades. Both the standardized tests and the grades provided more information about the participants, developing a better picture of the readers used in the study.

**Role of the Researcher**

The researcher brought to this study experience in literacy education at the undergraduate level as an instructor of both the reading process and content area reading. Not only did she possess an interest in literacy of static text, but with the ever-changing field of technology and informal observations of her own children and their friends who interact daily with the Internet in a variety of ways, she possessed great interest in the world of online reading. She came to this study focused on how children read information on the Internet, hoping to add to her own knowledge base of the reading process. As a result, her research required sixth-grade participants to answer questions using information within provided informational websites. The researcher gained access to the participants by making contact with the intermediate school principal and the sixth grade reading teacher, both of whom she had worked with on other projects. As she worked
with the participants, she observed and interviewed them as they worked through the Internet sessions.

To prepare for the Internet sessions, the researcher consulted the state academic standards as well as the school’s adopted curriculum for sixth grade. With an understanding of the topics covered in sixth-grade, the researcher spent many hours identifying age appropriate web sites, using the web site Juicy Studio which provided an idea of the reading level for each website ([http://juicystudio.com/services/readability.php](http://juicystudio.com/services/readability.php)). The goal for selecting web sites directly related to the school’s curriculum and state’s academic standards was to create an authentic learning experience for the participants, and the researcher created questions and an “assignment” typical of something their sixth grade content teachers might ask of them. This provided participants with an authentic experience. Once the web sites had been selected, the researcher spent time designing age-appropriate questions for the participants to investigate, keeping in mind the limited amount of time she would have with the participants. The researcher then created the parental consent form and the questionnaire for potential participants to complete.

**Pilot Study**

Prior to conducting the study under current consideration, the researcher conducted a pilot study in order to better understand the design. In the fall of 2009, two female fifth-grade students were selected to complete two Internet reading sessions at the researcher’s institution. Because the researcher knew the participants’ parents, the two were a sample of convenience. Their proximity to the institution and their schedules made it easy for the two to come to the researcher’s institution after school and wait for
each other. Both female participants were skilled readers, and the one was extremely verbal, allowing the researcher to see an excellent think aloud in action. Each participant completed a questionnaire that asked her to self-disclose her comfort level with thinking-aloud as well as the number of hours she spent on the Internet each week. The participants met individually and completed two different reading sessions that asked them to locate information on the given webpage. Websites used for the sessions were selected because they represented curriculum covered in the fifth-grade classes at the intermediate school where the two participants were students.

As the individual participants searched for information in the assigned webpages, the researcher videotaped the screens. She also used Camtasia, a software package that captured each individual screen change. Throughout each session, the researcher positioned her chair slightly behind and left of the participant in such a way that she could see the screen, body language, and facial expressions of the participant as s/he completed the Internet session. This allowed her to take field notes of the sessions. Following the Internet reading sessions, the videotapes of the sessions were transcribed and the researcher was able to use them for data analysis. Reading through the transcripts, the researcher made notes and began to examine the data for themes. In the pilot study, the researcher consulted Pressley and Afflerbach’s (1995) once she had identified categories of the coded transcripts. Initially, she used the term “predicting” as well as the phrase “returning to beginning.” As she examined her own transcripts and coded sessions against the work of Pressley and Afflerbach, not all of their categories appropriately identified those she discovered in the transcripts of her two pilot study participants; therefore, she eliminated Pressley and Afflerbach’s (1995) “making notes”
and “automatically reading until comprehension was not occurring” categories. Both of these were not used by the fifth-grade participants, and due to the nature of the researcher’s project, these two categories did not contribute to the study. Through analysis of the pilot study data, the researcher also added the category called “guessing,” which is not part of Pressley and Afflerbach’s (1995) findings.

Upon examination of the coded transcripts and the field notes, the pilot study influenced the current study in a variety of ways. First of all, the researcher understood the importance of linking the website to age-appropriate curriculum, particularly curriculum linked to the state’s academic standards. Both participants in the pilot study were able to connect to the web sites because of recent course work. Following the sessions, the researcher was able to have an informal conversation with the participants regarding the pilot study, which was important to the current study which focused on the reading strategies of sixth-grade Internet participants. With their feedback, the researcher understood the difference it made to the readers to select topics to which participants had had previous exposure. Schema appeared extremely important to the readability of the web site, just as Anderson (1984) had suggested. One participant commented that it was easier to find the information to answer the questions because she already had learned about the topic. She understood the content, building on prior knowledge as she searched for the answers.

Another element that helped clarify the current study was the changes made to the questionnaire. Originally, the researcher developed a questionnaire that required participants to finish a partial statement, confusing one of the participants and not providing the researcher with a solid understanding of the participant’s interaction with
the Internet or even her interaction with static texts. Instead of using open ended
text. Instead of using open ended questions that potential participants had to complete for this study, the researcher decided
to create a questionnaire using a format that used both open ended questions and a Likert scale. This change allowed the researcher to compare numbers of the participants’
responses, a more exact way of examining individuals and comparing them with the
others in the study.

Ultimately, the pilot study provided the researcher with the ability to see how the
think-aloud sessions would look. Because she had limited experience with conducting
think-aloud sessions, she found the pilot study sessions quite helpful in developing her
own foundational knowledge of this type of research. She realized the importance of the
placement of the video camera as well as the importance of instructing the students on the
volume they would need to use when speaking to the researcher. Through informal
interviews after the sessions, the researcher gained insight into the project by talking with
the individual participants.

Data Collection Processes

Data Sources

The initial data source for the study included a questionnaire designed by the
researcher which was sent home with the parental consent form. When the student
returned the signed consent form, she also returned this questionnaire which asked the
student to reflect on her experience with the Internet and her comfort level with using the
Internet for research. One of the more important elements of the questionnaire was the
question that asked the student to rate her comfort level speaking with a researcher. Due
to the think-aloud nature of the research project, this question provided crucial
information about potential participants. Like other researchers, this researcher chose to use the Likert scale format because it was easy to construct and was easily read by the sixth-graders (Hodge & Gillespie, 2003). Researchers accept that children eight-years-old and older can adequately self-report on their attitudes and feelings (van Laerhoven, van der Zaag-Loonen, & Derkx, 2004). Interestingly, in a study which compared the Likert scale against other forms of questionnaires for children such the Vicual Analogue Scale (VAS) and the numeric VAS the sample of 120 children implied that they found the Likert scale easier to use and more appealing (van Laerhoven et al., 2004). The Likert scale, however, sometimes poses problems for participants because it asks them to think on multiple cognitive levels and the statements are often worded negatively using the word “not” (Hodge & Gillespie, 2003). Because of these potential issues, however, the researcher took steps to limit the problems, particularly by phrasing the statements in the positive. She also took steps to make sure the sixth-graders understood the statements and how to assign a number to their feelings. None-the-less, because a sixth-grader’s interpretation of a number on the Likert scale could be questioned, the researcher selected two other forms of data collection: field notes and transcripts of videotaped Internet sessions.

Other data sources that the researcher used to select participants included informal recommendations by the sixth-grade reading teacher. When recommending students as participants, the sixth grade teacher considered the participant’s personality as well as his/her experience with conducting research and reading on the Internet. She carefully considered whether the participant would feel comfortable during the Internet sessions, being able to speak with the researcher about what was going through his/her mind as the
session progressed. Crucial to the success of this project was the participants’ willingness to think-aloud, and the classroom teacher knew the participants well enough that she felt confident in making these types of observations. While the classroom teacher did indicate to the researcher whether the participant was an above average, average, or below average student, specific information confirming these assertions were not collected until after the Internet sessions had been completed. At that point, the classroom teacher provided the researcher with the Spring NWEA scores, which were the most recent reading scores from the NWEA examination, and the third trimester’s reading grades on the school corporation’s report card, reported three times during the school year.

The most important data source for this study was the recorded Internet reading sessions with each individual participant. As the participants looked through the individual web sites for answers to the questions posed by the researcher, they were instructed to think aloud about what was going through their minds, explaining why they were making the choices they were making as they navigated the web pages. Throughout the sessions, the researcher kept field notes as she watched the participants. These notes provided important information for the researcher since she had noted the participants’ physical reactions to the web sites as well as their facial responses. Because the video camera was focused on the computer screen during the sessions, these field notes provided information that would have been missed. Each session, as mentioned before, was videotaped and screen captured using the software Camtasia, a program selected for its easy implementation and availability to the researcher. Even though she did not use the program as much as she thought, the researcher will use the program in
future research simply as a back-up way of recording the research. While the screen capturing program Camtasia was used, the researcher referred only three times during the writing of the video transcripts to the screen captures for clarification. The transcripts from the videotaped sessions and the field notes were the most important pieces of data used for analysis.

**Data Collection**

Prior to starting the study, the researcher visited each of the sixth-grade reading classes to provide the potential participants with an overview of the study. She explained the purpose of the study as well as the role of the sixth-grade reader. After she answered questions from the students, she sent home a packet of information that had been approved by both the principal and the superintendent of the school corporation. The packet contained a letter to the parents describing the study and a permission slip that was signed by both the student and the parent. Potential participants and parents found the researcher-developed questionnaire asking participants to self-assess themselves on their comfort level with the Internet, reading, and working with a researcher in a one-on-one setting. Questions on the one-page questionnaire asked participants to indicate the number of hours per week they spend on the Internet as well as why they used the Internet. Other open-ended questions required participants to consider themselves as Internet readers, asking them to categorize themselves as readers of the Internet. The researcher asked that the permission slips and initial questionnaires be returned to the classroom teacher one week from the distribution.

Once the researcher had examined the character makeup and teacher recommendation of each of the sixth-grade students who had parental or guardian
approval to participate in the qualitative phase of the study, she decided to use the eight students who had returned their forms, providing the researcher with a sample of convenience. Eventually, three of the eight dropped out of the study for various reasons, leaving the researcher with five readers who represented different reading abilities and personalities; these five participants were willing to work with the researcher on this project. Because the research had to take place outside of the regular school day so as not to disrupt student learning, the researcher worked around the participants’ extra-curricular activities, school obligations, and transportation issues. At this point, the researcher and the parents of the participants established dates and times for the participants to come to the researcher’s institution to participate in the online reading activities. During each session, the participant sat at a computer and before beginning the reading event, the researcher explained think-aloud procedures. She also demonstrated how to verbalize the thoughts she had as she did an activity.

Once the researcher explained the instructions and modeled how to think aloud, the participant completed a sample exercise in order to gain comfort talking out loud about his/her thoughts. The sample consisted of a predetermined web site with which the participant interacted, practicing his/her thinking aloud. Providing the participants with time to practice until they demonstrate comfort with the practice gave them confidence in completing the task. As a result, participants not familiar with thinking aloud had the opportunity to practice; this practice, the researcher believed, meant participants better equipped to articulate her thoughts.

After she determined the participants were comfortable with the
thinking aloud procedure, the researcher reviewed the directions. She then asked the participant if she had any questions. If the participant indicated she had no questions, the research commenced. As the participant read the Internet sources, she was asked to think out loud about the reading choices she was making as she read with each of the sessions being videotaped and recorded through Camtasia. Camtasia is a screen capture program installed on the computers used for research with the sole purpose to provide clarity to the researcher’s observations. The researcher during this time remained silent in order to avoid disrupting her thought process (Ericsson & Simon, 1993). If a participant was quiet for 10 seconds or more, failing to verbalize her thoughts, the researcher prompted the participant with statements such as “keep thinking aloud” or “keep talking” or “what are you thinking?” Once the participant had completed the reading exercise, she was asked follow up questions regarding the reading session; the follow up questions were primarily thought-process questions which provided the researcher with greater understanding of the participants’ thoughts regarding Internet reading.

As previously mentioned, the participants’ performance on standardized tests did not play a role in the selection of the participants. The researcher truly believed that eliminating this criteria for participant selection provided her with a sample that better represented the typical classroom found in American schools. Important information, however, was gleaned from test results as well as from trimester grades in the participants’ reading class. As the researcher knew that the information would provide a more complete picture of the participants’ personal characteristics. It would also help provide a context for reading behavior the participants exhibited during the sessions. At the end of the research project, the researcher met with the classroom teacher to discuss
the participants’ specific standardized test results as well as their grades in reading.

While this information did not change the results or the analysis of the data, it did provide a different descriptor of the participants. A chart such as Table 2 was constructed to illustrate the characteristics of the five participants.

**Table 2**

**Matrix of Participant Data**

<table>
<thead>
<tr>
<th>Coded #</th>
<th>Pseudonym</th>
<th>Gender</th>
<th>Winter NWEA RIT</th>
<th>Spring NWEA RIT</th>
<th>Spring ISTEP* Score</th>
<th>3rd trimester grade in reading</th>
<th>Weekly Internet use (hrs)</th>
<th>Comfort level</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>Anne</td>
<td>F</td>
<td>228 (86%)</td>
<td>228 (84%)</td>
<td>576 (Pass)</td>
<td>A</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>002</td>
<td>Laurel</td>
<td>F</td>
<td>218 (61%)</td>
<td>215 (48%)</td>
<td>582 (Pass +)</td>
<td>B</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>003</td>
<td>Jeremy</td>
<td>M</td>
<td>226 (82%)</td>
<td>212 (38%)</td>
<td>533 (Pass)</td>
<td>A</td>
<td>24</td>
<td>5</td>
</tr>
<tr>
<td>004</td>
<td>Konrad</td>
<td>M</td>
<td>218 (61%)</td>
<td>221 (66%)</td>
<td>576 (Pass)</td>
<td>A</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>005</td>
<td>Allan</td>
<td>M</td>
<td>231 (91%)</td>
<td>229 (86%)</td>
<td>580 (Pass +)</td>
<td>A</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

**Coding and Data Analysis**

Following the procedures for data analysis within the grounded theory context, the researcher closely examined the data for emerging patterns. According to Stake (1995), the direct-interpretation approach allowed the researcher to find meaning in the think-aloud data through an in-depth examination of each unit of analysis, focusing on the differences between participants in order to find emerging patterns. Data was collected and analyzed from the following sources: a self-reported questionnaire, transcripts of the video-tape recorded Internet reading sessions in which the participant thought out loud, and transcribed field notes. Because of the format of the questionnaire,
the researcher did not have a full picture of why the participants self-reported on the questionnaires as they did. The think-aloud, then, provided the researcher with the opportunity to examine a small sample of the sixth-grade students as they described their thoughts and behaviors in an authentic Internet reading activity.

Not only did the researcher write field notes as she observed the participant reading the Internet site, but she videotaped the event as well. Each of the Internet reading sessions was transcribed and reviewed several times, with references being made to the screen captures when it was needed. The field notes were also transcribed by typing the handwritten notes, adding legibility. As the researcher examined the transcript, she made general comments or notes of analysis in the margins. For example, the researcher wrote comments such as “matched name in question,” “educated decision,” statues and sculpture are similar,” “distracted by pictures,” “no reason for selection,” “great discomfort with format,” and so on. At this point, the researcher examined the notes in the margins, looking for commonalities. She realized that several of the comments contained similar themes. Many of the statements she had written in the margins indicated that the participants were simply scrolling through the web sites looking for words that matched a word or two in the questions. This eventually became the “matching” category. “Skimming” emerged as another common theme. Statements such as “scrolled quickly” or “moved cursor to bottom and then up quickly” helped form the “skimming” category.

At that point in the data analysis, the researcher returned to the transcripts and field notes and began to code the data, first by identifying each shift in the direction of reading which she identified as reading chunks. The coding chunks were determined by
examining the statements made by the participants; these sometimes included more than one statement. Sometimes, the coding chunk included comments or clarification questions asked by the researcher as well as the participants’ silence. The first identified codes included twenty or more codes. Several of the original codes were included finally in collapsed codes used for the final analysis. The researcher used colored highlighters to group the different segments of the transcripts and field notes. These paper copies were then cut apart, physically spreading them on a table in groups. Each was then re-coded, collapsing previously identified coding categories into new categories. Sometimes categories were merged and other times new categories were created. For example, the identified reading chunks originally labeled “read between the lines” became the coding category “inferences.”

Because Ericsson & Simon (1993) have found that coding categories based on previously gathered studies provide stronger evidence for the data obtained through the think aloud protocol, the researcher compared her initial notes and categories to the work of Pressley and Afflerbach (1995). For the purpose of this study, the pre and post-reading strategies were set aside. The primary focus of this qualitative study was on the strategies used during the reading process. These strategies include included (a) reading from front-to-back (linearly); (b) choosing to not read all of the sections; (c) skimming; (d) automatically reading until comprehension was not occurring; (e) reading aloud for comprehension; (f) reviewing or restating what was just read to clarify or remember; (g) making notes; (h) taking time to reflect on what was just read; (i) paraphrasing what was just read; (j) looking for specific words, concepts or ideas; (k) examining the text for patterns; (l) predicting what will happen in the text; (m) re-establishing reading goals as
the reading occurs (Pressley & Afflerbach, 1995). Ultimately, the researcher felt confident that she could leave the field of data, for she no longer found new information from the various transcripts and field notes. The data codes had been collapsed into the identified categories, which had merged her remaining categories she had identified and those expected by Pressley and Afflerbach (1995) into 11 remaining codes. These observations are discussed in a later chapter.

**Summary**

In order to provide a picture of the thought processes and ultimately the reading strategies used by sixth-grade readers with varying reading abilities, the researcher selected a qualitative study. As data collection points, the researcher used a questionnaire completed by the participants, transcripts of the think-aloud sessions which were videotaped; when needed, the researcher referred to the Camtasia screen captures for clarification of the videotapes. The researcher also used field notes she took as she observed the participants in each of their reading sessions. In following chapters, the researcher will describe the data using a collective case study which gives her the ability to look for emerging patterns among and between the individual cases.

Due to the researcher’s relationship and proximity to the intermediate school which houses the sixth-grade classrooms, the researcher chose a sample of convenience of sixth grade students who varied in their reading abilities. Participants were selected based on standardized test scores on the winter NWEA test as well as the students’ indication on the questionnaire that they were comfortable working with the researcher. The classroom teacher was able to provide the researcher with additional insight into the potential participants’ grades and observable abilities and skills.
During individual sessions, the participants were asked to investigate pre-determined web sites looking for answers to researcher generated questions. Each session was videotaped and observed by the researcher who also employed the screen capturing program Camtasia. The sessions were then transcribed in order to compare the strategies used by the participants to an accepted model of reading strategies used for reading static text (Pressley and Afflerbach, 1995). Once coded, the data were compared for similarities and differences. As the data were analyzed, patterns emerged. Through this analysis of data, despite the small sample of five sixth-grade readers, the case study provides researchers with a better understanding of the reading strategies used by sixth-graders when they read Internet material.
Chapter IV: Case Studies

The case study approach provides the researcher with a narrative method that gives readers a clear description of events that occurred during the research (Hitchcock & Hughes, 1995, cited in Cohen et al., 2000). Successful case studies incorporate details of the events along with analysis of the events, and these events provide a better understanding of the case (Hitchcock & Hughes, 1995, cited in Cohen et al., 2000). With these characteristics in mind, this chapter is divided into two sections: characteristics of readers and stances taken by the readers.

Section one provides a snapshot of each of the five participants involved in the current study. For each of the participants, the following information was examined: demographics including standardized test scores from the NWEA and ISTEP tests as well as identified exceptionalities; questionnaire responses; a sample transcript from approximately the same location in the reading session; Internet session 1 data, including field notes and transcripts; Internet session 2 data, including field notes and transcripts; and Internet session 3 data, including field notes and transcripts. A chart delineating the total number of times a strategy was used during the Internet reading session with calculated percentages is provided for each participant. The three or four strategies that emerged as the most frequently used are highlighted.

Three times each academic year, the participants’ school corporation administers the Northwest Evaluation Association (NWEA) test. In accordance with No Child Left Behind, the state also administers a yearly standardized test as well. In 2009, the participants’ state moved the administration of the Indiana Statewide Testing for Educational Progress Plus (ISTEP) to the spring. NWEA provides teachers and parents
with student performance in terms of RIT (Rasch UnIT) scores. RIT scores provide a picture of student growth over time. Included in the demographics for each participant is information regarding their standardized test scores on three tests: winter and spring NWEA and spring ISTEP+.

The data analysis ultimately suggested the presence of two difference stances or approaches toward reading Internet material. Each of the five participants manifested characteristics of one of these stances or approaches. The characteristics of each stance or approach were strong enough to warrant further exploration. As a result, section two, further examines the participants, but in terms of the stance or approach they typically used when reading Internet materials. Therefore, the terms “Navigators” and “Flounderers” are used as section titles for the case studies that follow.

Section One: Characteristics

“Navigators”

Anne.

At the time of the study, Anne was twelve-years-old, and confident in her reading of both traditional and Internet texts. According to the reading teacher, Anne was a fluent reader with a great imagination. Not only did Anne enjoy reading the books selected for class discussion, but the classroom teacher reported that she enjoyed reading on her own as well, and she read extensively outside of class. Her standardized test scores were rather consistent. The winter and spring NWEA scores demonstrated consistency in her reading achievement, but did not demonstrate growth. Her RIT score of 228 placed her in the eighty-sixth percentile in the winter and the eighty-fourth
percentile in the spring of 2010. On the ISTEP English/Language Arts test, Anne scored a 576, earning a Pass rating. Anne had no identified disabilities.

Questionnaire responses.

Anne’s responses on her questionnaire indicated that she spent much less time than the average American student online, and during a conversation with the researcher, she admitted that she is busy doing other things like playing with a sibling or reading a book for fun. She self-reported spending only one hour each week on the Internet, primarily to play games or check email. When the researcher asked a few clarifying questions before the first session began, Anne indicated that she enjoys the Internet, but doesn’t always consult it for homework because she can usually find the answers in the book. In regards to her self-assessment at being able to find information on the Internet, Anne gave herself a score of four, feeling she fell somewhere between good and excellent. This confidence came with her experience and her knowledge of how to read for information. When she looks for information on the Internet, Anne indicated that she first tries different web sites until she finds the right one, then she skims for the answers to the questions. Anne admitted that she often reads the Internet site quickly, and if she doesn’t find the answer she is looking for, she leaves the web site immediately. As a reader of printed texts, Anne reported she is excellent, but she was less confident in her ability to read Internet material, circling a four on the questionnaire. Of the five subjects, she was the most articulate in her ability to think aloud; this was reflected in her self-assessment of being extremely comfortable with talking out loud with the researcher as she read on the Internet. That same self-confidence resurfaced during each of the Internet sessions as she interacted with the researcher.
Table 3

*Online Reading Behaviors for Anne*

<table>
<thead>
<tr>
<th></th>
<th>Session #1</th>
<th>Session #2</th>
<th>Session #3</th>
<th>Overall Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining Importance (DI)</td>
<td>14%</td>
<td>19%</td>
<td>20%</td>
<td>18%</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>0%</td>
<td>2%</td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>Making Inferences (MI)</td>
<td>5%</td>
<td>5%</td>
<td>8%</td>
<td>6%</td>
</tr>
<tr>
<td>Matching Skills (MS)</td>
<td>10%</td>
<td>7%</td>
<td>4%</td>
<td>7%</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>24%</td>
<td>19%</td>
<td>22%</td>
<td>22%</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>21%</td>
<td>26%</td>
<td>24%</td>
<td>24%</td>
</tr>
<tr>
<td>Off Task – no reading strategy (OT)</td>
<td>8%</td>
<td>2%</td>
<td>6%</td>
<td>5%</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>5%</td>
<td>5%</td>
<td>0%</td>
<td>3%</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>2%</td>
<td>0%</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>5%</td>
<td>12%</td>
<td>12%</td>
<td>10%</td>
</tr>
<tr>
<td>Researcher Intervention</td>
<td>5%</td>
<td>2%</td>
<td>0%</td>
<td>2%</td>
</tr>
</tbody>
</table>

*Sample transcript for Anne from Session One.*

S: In what year did the work on the Royal tomb begin? [scrolls down/up the page and sighs] That’s a lot of words.

R: That’s a lot of words. Are you looking for something?

S: Yes, I’m skimming through the paragraphs to try to find the answer and what year, what did, what year did work on the Royal tomb begin?

R: So what are you looking for as you are skimming?

S: I am looking for a year or something. [continues to scroll down] That looks like King Tut.

R: Hmmm.

S: Work began on the dismantling… ewww!!

R: What’s ewww?

S: That’s there, they are mummmifying him. [continues to skim] Okay, several, no, that’s not it either.

R: Why did you say, why did you say ‘okay?’ What did you see?
I saw it said several reigns are on display from various sites, and I thought it was going to talk about what year because it says, ‘Oh, I am going to click on Royal Tomb now because maybe it will help me.’ [clicks, scrolls, and uses cursor to help skim]

They aren’t all this hard. I promise.

Okay.

Now, you are moving your mouse around, what are you, are you reading? Are you…

I’m reading.

Every word? Or are you reading some of the words?

I’m reading most of the words but not all of them.

You are allowed to skip that one and come back to it later by the way.

Okay. I think…

You do not have to go to each one of them. You think what? I’m sorry.

I think I found it, but I’m not sure. Okay, the vast majority of, uh, that’s not it, that’s when it was…dang.

[laughs]

Okay, I will come back to that one. What did rulers, why did rulers of Ancient Egypt have statues of themselves built? [scrolls up and down size column] Umm…I’m looking through the [pauses] things.

What are you looking for?

I’m looking to see if there are like, statues or something? I think I am going to go to Ancient Art.

Why would you click art?

Because like statues, art, artists make statues. [clicks on Ancient Art]

Okay.
S:  Umm… [scrolls up and down page] I’m going to go to ‘Mummy masks, to faces of dead’ because maybe it will say something about why they make statues of them, and it might give me some useful information. [clicks on title]

**Session one strategies.**

Examining the reading strategies Anne used most frequently during session one, the researcher identified four, determining importance, matching skills, monitoring understanding, and navigating, that were most prevalent during this particular reading session. Examples of each are provided below.

Table 4

**Session One Strategies Used by Anne**

<table>
<thead>
<tr>
<th>Code</th>
<th>Times used</th>
<th>Percentage of strategies used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining Importance (DI)</td>
<td>8</td>
<td>14%</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Making Inferences (MI)</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Matching Skills (MS)</td>
<td>6</td>
<td>10%</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>14</td>
<td>24%</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>12</td>
<td>21%</td>
</tr>
<tr>
<td>Off Task – no reading strategy (OT)</td>
<td>5</td>
<td>8%</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Researcher Intervention</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td><strong>TOTAL NUMBER OF STRATEGIES USED</strong></td>
<td><strong>58</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Determining importance.*

Of the strategies, Anne used while working through the Internet site on Ancient Egypt, she used determining importance eight of the fifty-eight times she made a decision in her reading process. At one point, when looking for information about the items found in King Tutankhamun’s tomb, Anne said, “I’m going to go, Oooh, what’s ‘Clickable
Coffin?’ Maybe that, it has coffins. Let’s see. It’s promising. Sounds promising.” Here she had looked at the choices and decided that this link might possibly lead her toward important information; she had determined it was an important direction to head. She immediately said, “Clickable coffin. There are tunnels in the coffins so maybe they buried something in their coffin with them. That would be important.”

Matching skills.

Of the four strategies that revealed themselves as the most prevalent, matching skills was the least used. Anne only used this strategy six time, relying much more on determining the importance or navigating through the web site. The best example occurred when Anne said, “umm… looking for King, the word King Tut” and she continued to scroll up and down. “Umm… I cannot find it.” Interestingly, this session was the only one of the three in which matching skills emerged in the top four strategies Anne used as she read the Internet site on Ancient Egypt. In the other two sessions, she only used matching skills as a strategy seven and four percent respectively.

Monitoring understanding.

As a reader, Anne monitored her reading with great attention. In fact, in session one, she used the monitoring understanding strategy twenty-four percent of the time. She often reread the content of the web page by slowly reading each word out loud. At one point, she said, “I think there is more to that because it doesn’t really tell why they wanted to leave their mark,” and she continued to scroll up and down on the page, monitoring her understanding and navigating at the same time. Because she knew a better answer probably existed, she sighed and went back to the index at the beginning of the page to “see if [she] missed anything.” When a link did not give her what she thought
she should find, she monitored her understanding and took a different direction. Often, she returned to the beginning of the page.

_Navigating._

For Anne, navigating the web page was a strategy she relied on and used quite well. At twenty-one percent of the strategies, navigating was obviously a strategy Anne employed frequently. While looking for information on the tomb, she performed several strategies at once. She said, “This looks promising, Akhenaton’s Reign- a year by year account of Akhenaton’s rule.” After determining this link might be important and take her closer to an answer, she clicked or navigated the link and exclaimed, “Woah. That was weird.” At this point she continued to skim the reading. Not only was she navigating the web site, but she was making decisions about the importance of the link and determining whether the information was adding to her understanding (monitoring understanding).

_Additional thoughts or strategies._

Throughout Session One, Anne was able to successfully get herself back on track quickly. At one point while skimming for information on the Royal Tomb, the word mummifying caught her attention even though it had nothing to do with the question on which she had been focused. She exclaimed, “Ewwww! They are mummifying him!” Not expecting a response from the researcher, she redirected her attention on the task by matching the word “Royal Tomb” with a hyperlink which ultimately took her to a page where she found the answer she needed. Just as quickly as she had been intrigued by the process of mummification, she put herself back on the right track. The entire process took just seconds.
Session two strategies used.

After examining the transcripts and field notes, the researcher identified four strategies Anne used most often in session two: determining importance, monitoring understanding, navigating, and reading word for word.

Table 5

Session Two Strategies Used by Anne

<table>
<thead>
<tr>
<th>Code</th>
<th>Times used</th>
<th>Percentage of total strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining importance (DI)</td>
<td>8</td>
<td>19%</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Making Inferences (MI)</td>
<td>2</td>
<td>5%</td>
</tr>
<tr>
<td>Matching Skills (MS)</td>
<td>3</td>
<td>7%</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>8</td>
<td>19%</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>11</td>
<td>26%</td>
</tr>
<tr>
<td>Off Task – no reading strategy (OT)</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>2</td>
<td>5%</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>5</td>
<td>12%</td>
</tr>
<tr>
<td>Researcher Intervention</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td><strong>TOTAL NUMBER OF STRATEGIES USED</strong></td>
<td><strong>42</strong></td>
<td></td>
</tr>
</tbody>
</table>

Determining importance.

In session two, Anne used determining importance nineteen percent of the strategies she used which occurred the same number of times as monitoring understanding. As she searched for information on the Soviet Union, Anne employed the determining importance strategy when she said, “I’m going to look at this thing, right here. Uhm… it looks like facts, fast facts. So I’m going to see if there are any… good facts.” Later, she said, “And I’m going to click on Cold War to see what countries were involved in the Cold War.” While this could have been interpreted as using the matching skills strategy, the researcher decided to put it in the determining importance category.
primarily because she was deciding to select the link thinking it might take her towards the right answer.

*Monitoring understanding.*

As she explored the web site on the Soviet Union, Anne again demonstrated the strategy of monitoring understanding. At several times during the session, she read word for word, found what she thought was the answer, and then returned to the place where she had started reading. Anne then proceeded to reread the text she had just read out loud. When the researcher asked her about her decision to return to the beginning of the reading, Anne said, “Well, I didn’t reread all of it, but I went back up and read what I read before, because it wasn’t really telling me anything except about peasants.” She wanted to make sure she had the full answer before moving to a different question. Characteristic of this strategy was Anne’s ability to examine the text and determine that she had either found the answer to her question or that she was not finding the information she needed. Both of these elements of monitoring understanding enabled Anne to adequately answer the questions with details from her reading.

*Navigating.*

Navigating was obviously the one strategy Anne relied on the most in this session, using it twenty-six percent of the time. Anne employed this strategy often quickly and simultaneously with other strategies. For example, in the same section of the transcript used for the example in the determining importance discussion above, Anne had been scrolling looking for an answer as to when the Soviet Union collapsed. She said, “And again, I’m going to click on the back button. And I’m going to click no the Cold War to see what counties were involved in the Cold War. Okay. It was a conflict between the
United States and its NATO (here she said each letter instead of the word, demonstrating a lack of prior knowledge) allies and the former Soviet Union and its Warsaw Pact allies,” and she continued to scroll down. In this brief excerpt, she navigated by clicking the back button as well as scrolling and skimming. She also demonstrated reading word for word and determining importance as well as monitoring understanding all within a brief time period.

Read word for word.

In this session and the next session, reading word for word emerged as a frequently used strategy for Anne. Even when the words were difficult because they consisted of foreign names, Anne worked diligently to pronounce each word. As a result, Anne used this strategy twelve percent of her session’s strategies. Frequently, Anne seemed to use this strategy as she monitored her understanding. For example, when she was exploring the site to see how Joseph Stalin changed the soviet society, she let go of the mouse and announced “Now I’m reading word for word.” The cursor remained motionless where she had left it. She read out loud, “Some elderly Russians see him as a national hero and a great leader,” and then she put her hand back on the mouse and scrolled down slowly. At this point, the researcher asked her what she was thinking, and Anne reported, “I’m just reading again.” Here she was not only reading word for word, but she was monitoring her understanding. Rereading what she had already examined. Later, towards the end of the session, Anne said, “oh, I see. It was one of the world’s most ethnically diverse countries, with more than one hundred distinct national ethnicities living within its borders,” and she continued reading word for word, trying her best to pronounce the Russian names.
Session three strategies used

Throughout session three, Anne used determining importance, monitoring understanding, navigating, and read word for word.

Table 6

Session Three Strategies Used by Anne

<table>
<thead>
<tr>
<th>Code</th>
<th>Times used</th>
<th>Percentage of total strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining Importance (DI)</td>
<td>10</td>
<td>20%</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Making Inferences (MI)</td>
<td>4</td>
<td>8%</td>
</tr>
<tr>
<td>Matching Skills (MS)</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>11</td>
<td>22%</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>12</td>
<td>24%</td>
</tr>
<tr>
<td>Off Task – no reading strategy (OT)</td>
<td>3</td>
<td>6%</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>6</td>
<td>12%</td>
</tr>
<tr>
<td>Researcher Intervention</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>TOTAL NUMBER OF STRATEGIES USED</td>
<td>49</td>
<td></td>
</tr>
</tbody>
</table>

Determining importance.

In all three sessions, Anne used determining importance as one of her top strategies, and in this particular session which required her to explore information about the climate, Anne used it twenty percent of the time. As in the second session, she often used this strategy as she used the navigating strategy. For example, she started this session by skimming the entire first page, surveying her choices. While this seems to be navigating, she was completing and important task: looking for important information that would lead her towards finding the answers to the questions the researcher had just read. Soon she used the determining importance strategy again because she read the question and decided to select the link called Climate Tales, believing it would take her to
information about how the climate has changed. Anne appeared to use determining importance simultaneously as she used the navigating strategy. She was able to read quickly, decide if a link would take her in an appropriate direction, and navigate through the web page.

*Monitoring understanding.*

Throughout this session, Anne employed this strategy twenty-two percent of the time. One of the best examples of Anne monitoring her understanding during the third session occurred when she clicked on a link entitled “Climate Tales,” which took her to an animated video. At first she thought it might provide her with some important information, and she announced, “This is very informative.” After watching another minute of the video, however, she seemed annoyed. She commented, “This isn’t helping me.” As the video continued to play, Anne explored the hyperlinked buttons on the side bar trying to make a decision. Finally, she selected to click on a different button, “How do we know the climate is changing?” and said, “I hope this doesn’t take me back to the video.” At another time in this session, she admitted, “So far I’m not getting anything,” and then she returned to the page to see if there were better choices. Each of these examples demonstrates Anne’s successful monitoring of her understanding of the text. She was able to determine whether the information was adding to her overall understanding of the text and, important for the task at hand, whether it was providing her with enough information to answer the question.

*Navigating.*

As in the previous two sessions, navigating was the number one strategy Anne used as she read the Internet site, using it twenty-four percent of the time during this
session. Her navigating choices included clicking on buttons and scrolling. Frequently she would scroll through the site and when she wanted to read the information carefully she took her hand off the mouse. Looking for information about temperature changes, she said, “I’m scrolling back up. I’m going to go back up again. Well, I guess I can just press on home.” As she hummed to herself, she looked at the box on the right hand side and read the words under her breath.

*Read word for word.*

While Anne only used reading word for word twelve percent of the time, it still emerged in this final session as an important strategy she used while reading. Again, she often used this strategy as she monitored her understanding. For example, after she thought she had found the information, she would take her hand off the mouse and read word for word. At one point she said, “I’m going to read this one because it says ‘Why is Earth’s global temperature a big deal?’” and she proceeded to read out loud. At another time, she announced, “I’m reading all of it [the text] right now.” She glanced at the question again on the paper and then proceeded to read, “Climate change is where it changes temperatures, rainfall, wind and other conditions over a larger region and a longer time.” She scrolled to the bottom of the page and then back to the spot where she had just read aloud. She restated confidently, “Climate change is when it changes the temperature, rainfall, wind, and other conditions over a larger region and for a longer time.”

*General comments.*

In all three sessions, Anne consistently used similar strategies. She determined the importance of a clink, navigated the web page, and monitored whether it added to her
understanding of the content. As the sessions came to an end, Anne offered a few thoughts regarding the research project. She indicated that if she had been doing the assignment for her social studies teacher, she would have skipped a question and asked him the following day. After completing the first Internet session, Anne said that whether she skims or reads word for word on the Internet depends a lot on the questions asked by her teachers. Sometimes, she said, “you can just skim and look for highlighted and bold words; other questions, you have to actually read the whole paragraph to see.” She added that she uses this same technique when she reads her social studies or science textbooks; she skims looking for a bold word or part of the question in the text instead of reading the entire chapter or section. Anne mentioned that the biggest difference between using a textbook and the Internet to find information is that on the Internet she can quickly abandon a web site for another one. If she is assigned a textbook, she doesn’t have that option. She concluded the third session by saying that if she had a choice when conducting research, she would use the Internet, especially because she usually has a choice to skip around to different sites.

**Konrad.**

Konrad was a white male, twelve-years-old, who was confident in his ability to read both traditional and Internet text. His reading teacher commented that Konrad was a good reader and quite fast. She mentioned that he often turned to his outside reading book when he was finished with his regular reading assignment. Consistently, according to the reading teacher, he participated in reading group discussions. His standardized scores indicated that he was a relatively average reader. He earned a 522 on the ISTEP+ test which earned him a Pass rating. His winter and spring NWEA scores, however, were
low in both the winter and spring testing cycles. In the winter, he scored a RIT of 218, placing him in the sixty-first percentile. His spring NWEA scores did improve, though, with a RIT of 228. Still, he was only in the sixty-sixth percentile. Konrad does not have a documented disability.

**Questionnaire responses.**

Konrad self-reported spending five hours each week on the Internet primarily in Facebook and playing games. He did write on the questionnaire that he also uses the Internet to study when he needs to do so. When he talked with the researcher during the first session, though, he admitted to spending most of his time not doing academic activities on the Internet, using it for recreation time. Viewing his self-reported scores on the questionnaire, one can see his self-concept emerge. He circled five each time, indicating he was excellent at finding information on the Internet, he was an excellent reader of printed text as well as an excellent reader of Internet text, and he was extremely comfortable at talking out loud about his thoughts as he read on the Internet. When looking for information on the Internet, Konrad recorded that he first “reads to see what it is.” At the first session, the researcher asked him to clarify that particular statement, and he replied that he skims through the web site to see if it might be appropriate for finding the information for which he is searching. According to Konrad’s response on the questionnaire, if the web site looks like it will provide him with information he needs, then he finishes skimming the source. He was quick to admit, though, that if the web site appears that it will not provide him with important information, he returns to the search engine to look for better web sites. At the first session, Konrad commented about his responses to the questionnaire, and he sheepishly admitted he was impatient.
Table 7

*Online Reading Behaviors for Konrad*

<table>
<thead>
<tr>
<th>Reading Behavior</th>
<th>Session #1</th>
<th>Session #2</th>
<th>Session #3</th>
<th>Overall Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining Importance (DI)</td>
<td>15%</td>
<td>12%</td>
<td>10%</td>
<td>12%</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>0%</td>
<td>2%</td>
<td>5%</td>
<td>2%</td>
</tr>
<tr>
<td>Making Inferences (MI)</td>
<td>2%</td>
<td>5%</td>
<td>8%</td>
<td>5%</td>
</tr>
<tr>
<td>Matching Skills (MS)</td>
<td>12%</td>
<td>11%</td>
<td>3%</td>
<td>9%</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>17%</td>
<td>11%</td>
<td>13%</td>
<td>14%</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>35%</td>
<td>35%</td>
<td>40%</td>
<td>37%</td>
</tr>
<tr>
<td>Off Task – no reading strategy (OT)</td>
<td>2%</td>
<td>0%</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>4%</td>
<td>5%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>4%</td>
<td>0%</td>
<td>15%</td>
<td>6%</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>4%</td>
<td>17%</td>
<td>5%</td>
<td>9%</td>
</tr>
<tr>
<td>Researcher Intervention</td>
<td>6%</td>
<td>3%</td>
<td>0%</td>
<td>35%</td>
</tr>
</tbody>
</table>

*Sample transcript taken from session one.*

S: Uhmm, let’s see… In what year did work on the Royal tomb begin? [moved cursor along the buttons on the left hand side of the page; did not select one] I would probably…. Let’s see…type in royal tomb [went to web site’s search engine at the top of the page and typed in royal tomb]

Let’s see. [moved cursor around the new page] let’s see. Then I would probably, like, scroll down, for like, for years or number.

R: Okay.

S: Skim.

R: You’re skimming? Are you looking for just numbers?

S: or year [scrolled down then up quickly then down again. Moved cursor over the diagram of the tomb, but quickly scrolled back up again.]

[Whispered under his breath- inaudible] let’s see. [Whispered] In what year? Hmmmm… [scrolled up and down- seemed stuck]

R: What are you thinking?

S: What millennia means?
R: You’re wondering what millennia means?

S: [noded. Scrolled up and down again not stopping. Moved cursor to the buttons on the left hand side. Highlighted buttons as he moved cursor over them quickly]

R: What are you looking for now?

S: [shrugged]

R: Are you just looking for something that pops out at you? I’ll tell you this one’s a hard one. A couple of people have struggled with that one. If you want to skip that one and come back to it, I can give you a hint later.

S: Okay [seemed genuinely relieved] Why did rulers in Ancient Egypt have statues of themselves built? Let’s see, I’d probably go to Ancient…statues, statues, statues… [scrolled across the buttons. Started to type statues in search box. Stopped. Moved cursor to the buttons] Faces of the Dead probably because it might have something. Why do not they have it?

R: laughed because he seemed genuinely surprised that the answer wasn’t there. Why would they have it?

S: Probably to like to tell people they were like famous or something?

R: Okay. [scrolled up and down over links, but didn’t select one] Are you seeing what you wanted to find there?

S: Uh, no. [Clicked on back button?] But they probably like wanted people in modern times to like know them as like special in Egyptian time.

R: Okay, what did you just click on? Did you click on…

S: I clicked on… [moved cursor to first button]

R: Okay. Did you click on the first button?

S: yeah.

R: Just because?

S: Just to go back to see if there’s something

R: Okay.

S: Well, I clicked on statues here.
R: Okay.
S: Every ruler of ancient Egypt wanted to leave their mark on history.
R: So that’s the answer?
S: Uh, huh.

*Session one strategies used.*

For session one, Konrad used a variety of strategies, but four, in particular, surfaced as the most frequent: determining importance, matching skills, monitoring understanding, and navigating.

Table 8

*Session One Strategies Used by Konrad*

<table>
<thead>
<tr>
<th>Code</th>
<th>Times used</th>
<th>Percentage of total strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining Importance (DI)</td>
<td>8</td>
<td>15%</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>0</td>
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<tr>
<td>Navigating (N)</td>
<td>18</td>
<td>35%</td>
</tr>
<tr>
<td>Off Task – no reading strategy (OT)</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>2</td>
<td>4%</td>
</tr>
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</tr>
<tr>
<td>Researcher Intervention</td>
<td>3</td>
<td>6%</td>
</tr>
<tr>
<td><strong>TOTAL NUMBER OF STRATEGIES USED</strong></td>
<td><strong>52</strong></td>
<td></td>
</tr>
</tbody>
</table>

_Determining importance._

Although Konrad relied heavily on the navigating strategy, he still used determining importance fifteen percent of the time during session one. Determining importance occurred when he said that he would select the button “Faces of the Dead,” because “probably it might have something.” He had selected this particular button,
confident that it would provide him with an immediate answer. However, the researcher, at this point, laughed when Konrad seemed genuinely surprised and exclaimed, “Why do not they have it?” He had been sure that his decision to click on that particular link would take him to the specific answer; at that point, he wasn’t sure what to do, and scrolled up and down on the page, looking for something to catch his eye. Instead of selecting one of the many highlighted links, Konrad selected the back button. However, his original confidence in the link demonstrated his confidence in the importance in that link. Late, when examining the site in order to identify some of the items found in King Tut’s tomb, he selected the link “Treasures.” He commented, “I’m going to click on “Treasures.” It says what was found in his tomb, tomb. His gold coffin was the best… and his masks.” Because he understood that treasures were important objects, he felt sure this link would prove to be important.

Matching skills.

Like the other participants, Konrad used matching skills frequently; twelve percent of the strategies in session one were matching skills. For Konrad, matching the word in the text to a word in the question was an effective way to find information. He said, “I’m going to try this because it says the person’s name right here,” and he moved the cursor over Akhenaton’s name. Using the cursor to highlight the choices, he found exactly what he wanted to. Later, as he explored for the date building the Royal Tomb began, he said, “Let’s see… let’s see. Then I would probably, like, scroll down, for like, for years or numbers.” Simply matching the word in the question to a word on the page often provided Konrad with an immediate answer or at the very least took him towards part of the page that allowed him to locate the answer.
Monitoring understanding.

Seventeen percent of the total number of strategies used by Konrad involved monitoring understanding. Konrad exhibited this strategy when he read the section his choice had taken him to, and made a decision to either answer the question or to return to his search. At one point, he said, “Here we go,” feeling sure that he was reading something that helped him understand the text. At another time in this second session, he continued to read, double checking for information. He had just made a decision to click on a link and he skimmed the material. However, in order to make sure he understood what he was reading, he clicked on the button again and said, “Just to go back to see if there something.” This one step alone demonstrates Konrad’s focus on getting the right answer. He evaluated whether he was finding the appropriate information or not. When he knew he wasn’t, he returned to an earlier point or kept reading. At other times, he went all the way back to the starting point, and started his search again.

Navigating.

Konrad relied heavily during this first session on the navigating strategy. In fact, he used it thirty-five percent of the time. Ignoring the button selections on the left-hand side, Konrad immediately began slowly typing “Akhenaton” in the search box at the top of the page, checking the spelling several times. When the link choices appeared on the screen, Konrad moved the cursor under the top two choices, rather than scrolling down to see which other selections were available. Instead of selecting one of the choices, he began to enter “Akhenaton” in the Google search box. At this point, the researcher redirected Konrad to stay within the prescribed site. He appeared frustrated that he could not find the answer quickly and was willing to abandon the researcher’s selected site.
within a short amount of time. Throughout this session he often used the cursor to move under the words using it to highlight as he read.

**Session two strategies used.**

Session two for Konrad was similar to the first session, using determining importance, matching skills, monitoring understanding, and navigating. However, Konrad also used reading word for word as his second most frequently used strategy, a strategy he did not use much in the first session.

Table 9

*Session Two Strategies Used by Konrad*

<table>
<thead>
<tr>
<th>Code</th>
<th>Times used</th>
<th>Percentage of total strategies</th>
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<tbody>
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</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>11</td>
<td>17%</td>
</tr>
<tr>
<td>Researcher Intervention</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td><strong>TOTAL NUMBER OF STRATEGIES USED</strong></td>
<td><strong>65</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Determining importance.*

Twelve percent of Konrad’s decisions during session two consisted of determining importance. Just as he did in the first session, Konrad determined as he navigated the web site. After answering the first question on who Joseph Stalin was, he did not exit this part of the web page to answer the next question. Instead, he had
determined from the location that it might provide him with information to answer the next question, “What were some of Joseph Stalin’s names?” He decided to stay there after he realized the content of the section. Eventually, he realized he was not in a place where he was gathering important information. He typed in “ethnic groups” into the search box as discussed in the navigating section and had to determine which choice was the best. In reference to the choices, Konrad said, “I’m going to click on this because I read a little bit and it says…” and he selected the link. This last statement was in reference to the descriptions under the choices provided him after using the search box.

Matching skills.

Eleven percent of Konrad’s second session’s strategies involved matching skills. In this session, Konrad looked again for key words. Several times throughout this session he made reference to “skimming them green words.” At other times, he talked directly about the words. For example, he commented, “Oh, yeah, Stalin changes the Soviet Union,” and the question had read “How did Stalin change the Soviet society? As mentioned in the navigating section for this session, the two strategies seemed to work together for Konrad. For example, he quickly navigated a page looking for ethnic groups after he had already typed the term “ethnic groups” into the search box and struggled with finding the information he needed. Scrolling through the pages, he said, “I thought I saw something else,” and he continued to scroll up and down the page. He whispered, “I see ethnic, so probably I would try that. Then I would look at them green words.” These “key words,” as Konrad called them, seemed to be his primary focus as he navigated the web page. He looked quickly for the highlighted words, and counted on them to take him to important information.
Monitoring understanding.

Monitoring his understanding eleven percent of the time, Konrad’s behavior several times illustrated this strategy. During this second session, Konrad read a few of the sentences out loud and checked his understanding. When the researcher asked, “So what would you write down? Would you write anything down at this point?” he replied “uhmm no… not if I’m not quite… If I’m like kind of sure but not…” Here he stopped talking and continued to read until he felt he had located the answer to answer the question. He had evaluated or monitored his understanding that he did not have enough information to answer the question fully at the point when the researcher had asked him. According to the researcher’s field notes, Konrad was struggling with the structure of the web site. He knew he was not understanding the content because of the format of the site, but he did not quite know how to articulate that to the researcher.

Navigating.

Konrad was obviously quite at ease with his navigation of the web page. During this second session, he used navigating thirty-five percent of the time. Instead of relying heavily on the search box this time as he did in the first session, Konrad skimmed the text, looking for hyperlinked words. “I skimmed them green words looking for Joseph Stalin,” he reported to the researcher. Konrad’s initial method for location information involved navigating the web page looking for these hyperlinked words that he hoped would lead him to the right answers. At other times during the session, Konrad did resort to the search box. For example, at one point, Konrad reported that he didn’t see hyperlinked key words, so he proceeded to type the word in to the search box. He quickly evaluated the choices, and within seconds commented, “I didn’t find anything.”
When the researcher probed why he said he did not find anything, he replied, “I read like some of the words and they had nothing to do with like the end do the cold War, and well they said things like the leaders of the Cold War and so I could probably just go back to the Cold War since I didn’t finish it. To see if I missed something.” At this point, he returned to a previous page. Konrad was quite comfortable with this strategy; it appeared to be a strategy he had used often before the research sessions.

*Reading word for word.*

Unlike the other sessions, Konrad actually seemed to rely heavily on the strategy of reading word for word. In fact, he used this strategy seventeen percent of the strategies he used in session two. He often used the cursor to follow a long and he either read them out loud or whispered them to himself. His use of this strategy didn’t seem to matter at what point in the session it came or what he was doing; he would stop and read each word. One time he clicked on the link and sat in silence reading the text, and then switched to whispering the words under his breath. Shortly after that particular snapshot, he looked for information on the leaders of the Cold War. Reading the section through once, Konrad returned to the previous entry to read more deliberately for missed information. Because this particular web site gave him trouble from the beginning with its format, Konrad seemed much more deliberate in his reading. This time seemed more associated with monitoring his understanding whereas the first example illustrated his examination of the material for the first time.

*Session three strategies used.*

Konrad’s third session was slightly different than his first two sessions. He used the primary strategies of determining importance, monitoring his understanding and
navigating. This time, however, he relied heavily on reading pictures. Because he did use making inferences one time less than he used the determining importance strategy, the researcher will discuss his use of this strategy as a secondary strategy. There did not seem to be a difference in the way he used both of these strategies and they warrant discussion together.

Table 10

*Session Three Strategies Used by Konrad*

<table>
<thead>
<tr>
<th>Code</th>
<th>Times used</th>
<th>Percentage of total strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining importance (DI)</td>
<td>4</td>
<td>10%</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>2</td>
<td>5%</td>
</tr>
<tr>
<td>Making Inferences (MI)</td>
<td>3</td>
<td>8%</td>
</tr>
<tr>
<td>Matching Skills (MS)</td>
<td>1</td>
<td>3%</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>5</td>
<td>13%</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>16</td>
<td>40%</td>
</tr>
<tr>
<td>Off Task – no reading strategy (OT)</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>1</td>
<td>3%</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>6</td>
<td>15%</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>2</td>
<td>5%</td>
</tr>
<tr>
<td>Researcher Intervention</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>TOTAL NUMBER OF STRATEGIES USED</strong></td>
<td><strong>40</strong></td>
<td></td>
</tr>
</tbody>
</table>

_Determining importance._

Konrad used determining importance only four times throughout the third session, but it counted for ten percent of the total strategies used because compared to the other sessions, he didn’t spend as much time working through the web site. One of the best examples from this session that demonstrated Konrad’s use of the determining importance strategy came when he came upon the link to a video and he quickly had to evaluate the importance of selecting the movie. He said, “It’s just a video,” and
proceeded to ignore the choice. Here he had shown that he knew selecting that particular link would not give him information key to answering the questions. Another example from this session included Konrad clicking on “the ice thing” because he believed it would talk about the melting ice and the impact it had on the global environment. As in the other sessions, Konrad determined the importance of a link quickly as he navigated, looking at his choices, evaluating them, and then making a decision based on his rapid assessment.

*Monitoring understanding.*

Monitoring understanding occurred thirteen percent of the third session for Konrad. He demonstrated this strategy consistently when he began to answer a question and then continued to read for clarification. For example, as he looked for the relationship between cold winters and global warming, he began reading word for word and he removed his hand from the mouse. He said, “Says there is supposed to be a big snowfall or something… like global warming is slowing down… going backwards. Global warming is slowing down or going backwards.” The researcher at this point asked him if that answered the question, and Konrad replied, “Uhm, not yet. I do not think so,” and he kept reading. At another time, he thought he knew the answer, but then continued to search, returning to the starting point. This demonstrated that he realized he had not found the correct answer yet; he had monitored his own understanding and realized he needed to keep searching.

*Navigating.*

As in the other sessions, navigating appeared to be the primary strategy Konrad employed. Before Konrad began looking for information during the third Internet
session, he skimmed the entire opening page and commented, “I would probably scroll
down here so I can see all what is on this page.” He continued to determine the
importance of the choices he had available as he said, “I think carbon is kind of like air,
so I’m just going to click air.” Then he selected the button to the right of the main picture
frame. When the computer seemed to slow, Konrad quickly typed “carbon dioxide” in the
search box just as he had done in the previous sessions. A few minutes later, Konrad
used a rapid succession of navigating exchanges. He scrolled to the top of the page and
then clicked on the home button because he remembered that he had seen something
about climate change earlier. At that point, the researcher clarified, “Okay, so you
remembered?” Konrad responded, “Yeah, like right here.” A picture box in the middle
of the page had a picture with the words climate change, and he clicked on it. At his
point, then he scrolled down the page and then quickly back up to the picture.
Interestingly, he did not see anything he liked, so he began typing the word “climate” in
the search box, scrolled won fast and then back up to the top. At last he hovered his
cursor on the last choice provided by typing in the search box. One can easily see that
without much delay, Konrad made rapid decisions that included the navigating strategy,
changing his direction within a matter of seconds.

*Reading pictures.*

The primary difference in the third session for Konrad was his tendency to rely on
the pictures more than he had in the previous sessions. In fact, he read the pictures
fifteen percent of the time primarily because the site had many more pictures; the second
session had no pictures available other than a chart. Instead of reading the text, Konrad
seemed to view the picture and then guess at the answer to the question. He felt confident
that he had gathered enough information from the picture to answer the question, and then he quickly navigated away by scrolling back to the top of the page. In another instance during this third session, Konrad physically pointed to three different pictures that appeared on the computer screen. Here he fully made inferences about the pictures without reading the text. “It’s like right there. It is all snowing, and right there. It is kind of warmish cold, and this looks like kind of warm,” he pointed out. Instead of directly answering the question, Konrad believed that by “reading” the pictures, he had adequately found the answer. Examining his “answer,” one can see that he truly did not grasp the content of the material; however, that was not the focus of this particular research project.

*Secondary strategies.*

While most of the other participants did not appear to use secondary strategies, Konrad did use making inferences a few times during this third session. Because he used it only one less time than other strategies that were considered frequently used, the researcher felt it warranted some discussion here. For Konrad, making inferences happened only eight percent of the time, but he used it to make importance guesses or decisions. The researcher’s notes indicated that he had relied on this strategy before, perhaps it had been successful for him in school. For example, he said, “I think ice caps are used to uh like the winter weather and stuff and that’s where they build up and stuff. In the summer they start to drop because they do not have the cold weather to keep them uhhhh… keep them… like stable.” While this wasn’t the exact answer posed by the website, Konrad did read between the lines and create an educated guess. If he had been completing a worksheet for a homework assignment, most likely the teacher would have
counted this answer correct. This particular strategy, then, as served him well, and he realized he could apply it to the Internet as well.

**General comments**

As the third session ended, Konrad talked with the researcher about the differences between reading a source on the Internet and reading a printed or static text. According to this sixth-grader, he preferred to use the Internet instead of books, indicating to her that web sites are easier to use, and they are often his first choice as a resource. “For homework,” he said, “it is easier to find the answers. First I look at the book and if I can’t find it, I look on the Internet. I just type in key words and usually I get it right away.” When the researcher asked him why he thought it did that, he replied, “The Internet is smarter than books. More up-to-date probably.” He was clearly well-versed in using the Internet, and made use of its search features within the prescribed web sites.

**Allan.**

Allan was a pleasant, twelve-year-old Caucasian male who happily interacted with the researcher and made small talk both before and after the Internet reading sessions. The classroom reading teacher suggested that he had a developed ability to read and comprehend. However, she also commented that he wasn’t as motivated when it came to class assignments and only did enough to get by. Interestingly, according to the classroom teacher, Allan often played the devil’s advocate in his reading group, offering counterpoints to group discussions. He also sometimes appeared to be disengaged in the reading groups, but he was an avid reader who reported on his reading calendars that he read over one thousand minutes each month. Of the five participants, his standardized
test scores place him as a more skilled reader compared to the others. In a variety of areas, he was above average. In fact, he scored higher than others. On the winter NWEA test, his RIT was 231, placing him in the ninety-first percentile. His spring NWEA score did drop slightly, but his RIT of 229 still placed him in the eighty-sixth percentile. On the ISTEP+ test in the spring of 2010, he earned a 580 in the Pass Plus category. Allan does not have a documented disability.

**Questionnaire responses.**

According to Allan’s questionnaire, he estimated he spends three hours each week on the Internet. During this time, he likes to “play games or search for stuff for research.” Interestingly, even though Allan was one of the top two skilled readers selected for the study, his confidence level was much lower than the others including the self-confidence of the weaker readers. While he did indicate that he was an excellent reader of printed text, he self-reported that he was only good (not between good and excellent or excellent) at finding information he needs on the Internet and good at reading Internet material. He was also only “sort of” comfortable talking out loud to the researcher while he read the Internet; however, the classroom teacher encouraged the researcher to select Allan because she believed he would be okay thinking out loud with the researcher. As it turned out, Allan was quite comfortable talking with the researcher; she only had to remind him a few times to articulate what was going through his mind. During the sessions, Allan had no difficulty performing this task while reading on the Internet. When Allan searches for information on the Internet, he indicated that first he usually uses the search engine Google or uses ask.com or wikianswers.com to locate the information. He then writes down the web site and looks for the information; he
suggested that he often looked for the fastest way to find information, and because he had worked quickly through the sessions, the researcher did not find this hard to believe about this participant.

Table 11

*Online Reading Behaviors for Allan*

<table>
<thead>
<tr>
<th></th>
<th>Session #1</th>
<th>Session #2</th>
<th>Session #3</th>
<th>Overall Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining Importance (DI)</td>
<td>15%</td>
<td>7%</td>
<td>13%</td>
<td>12%</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>3%</td>
<td>8%</td>
<td>4%</td>
<td>3%</td>
</tr>
<tr>
<td>Making Inferences (MI)</td>
<td>6%</td>
<td>8%</td>
<td>13%</td>
<td>9%</td>
</tr>
<tr>
<td>Matching Skills (MS)</td>
<td>10%</td>
<td>10%</td>
<td>9%</td>
<td>10%</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>13%</td>
<td>13%</td>
<td>13%</td>
<td>39%</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>20%</td>
<td>21%</td>
<td>17%</td>
<td>19%</td>
</tr>
<tr>
<td>Off Task – no reading strategy (OT)</td>
<td>3%</td>
<td>5%</td>
<td>13%</td>
<td>7%</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>18%</td>
<td>10%</td>
<td>4%</td>
<td>11%</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>0%</td>
<td>0%</td>
<td>4%</td>
<td>1%</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>5%</td>
<td>11%</td>
<td>4%</td>
<td>7%</td>
</tr>
<tr>
<td>Researcher Intervention</td>
<td>10%</td>
<td>7%</td>
<td>4%</td>
<td>7%</td>
</tr>
</tbody>
</table>

*Sample transcript taken from session one.*

S: Hmm…

R: What are you thinking?

S: To think if I’m going to click on this button or not.

R: Okay, and were you reading the sentence that that button’s in?

S: Yeah.

R: And you think you’ll find something on the Royal Tomb, huh?

S: Yeah. [clicks and scrolls down]

R: What are you looking for?

S: Trying to find where it says when it was first started working on.

R: Okay.
S: But it doesn’t tell.

R: Okay. [pause] Okay, what are you doing?

S: Going to type in the question because I didn’t find it.

R: Ahh. I haven’t had anybody else do that yet.

S: [types in question in Search box]

R: [laughs] What happened?

S: It just went straight back to where I just was. I guess it’s in this part.

R: What makes you say that?

S: ‘cause this, it’s the story of Akhenaten, and it’s talking about when the Royal tomb began.

R: Okay. Now, are you reading word for word, or are you skimming?

S: I’m skimming right now.

R: And are you looking for something in particular?

S: Yeah.

R: What are you looking for?

S: Umm, the royal tomb.

**Session one strategies used**

In session one, Allan, who was rather quick with using the web site, used determining importance, monitoring understanding, navigating, and prior knowledge. While he depended much more on navigating than the other four strategies, he did make good use of the others. The strategy of using prior knowledge seemed to serve an important part of his use of the navigating strategy. As expected, because Allan knew something about the topic, he quickly made decisions based on that schema.
### Table 12

**Session One Strategies Used by Allan**

<table>
<thead>
<tr>
<th>Code</th>
<th>Times used</th>
<th>Percentage of total strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining Importance (DI)</td>
<td>6</td>
<td>15%</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>1</td>
<td>3%</td>
</tr>
<tr>
<td>Making Inferences (MI)</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td>Matching Skills (MS)</td>
<td>4</td>
<td>10%</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>5</td>
<td>13%</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>8</td>
<td>20%</td>
</tr>
<tr>
<td>Off Task – no reading strategy (OT)</td>
<td>1</td>
<td>3%</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>7</td>
<td>18%</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>2</td>
<td>5%</td>
</tr>
<tr>
<td>Researcher Intervention</td>
<td>4</td>
<td>10%</td>
</tr>
<tr>
<td><strong>TOTAL NUMBER OF STRATEGIES USED</strong></td>
<td><strong>40</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Determining importance.**

For fifteen percent of the strategies, Allan used determining importance during this first Internet session. He exhibited this strategy when he consciously deliberated about whether or not to click a hyperlink. When the researcher asked him what he was thinking because he had stopped and was clearly looking at one specific button, Allan responded, “To think if I’m going to click no this button or not.” Ultimately, he decided that the button was important enough to select and that it would take him to information about the Royal Tomb. Later he decided to select one link over another because he determined that it would be more likely to give him an appropriate answer. Allan was able to quickly make these decisions as he worked his way through the web site.

**Monitoring understanding.**

Allan also used monitoring understanding frequently. He used this strategy thirteen percent of the time during the first session. Monitoring understanding
manifested itself when Allan commented, “I clicked on that to see if I was right.” Here he had made a statement that he thought was a good answer, and then he went ahead and did further reading to make sure he was correct. At another point in the session, Allan continued to navigate, looking for information about the building of the Royal Tomb. He had trouble finding an exact date, and quickly left a page he had selected. He commented, “It doesn’t tell.” Allan had known almost immediately that he was not finding the answer to the question; it was at this point he decided to type the entire question into the search box.

Navigating.

As just mentioned in the previous section on monitoring understanding, Allan liked using the search box to locate appropriate information. This contributed to using the navigating strategy twenty percent of the time during this first session. Not only did he type the entire question into the search box, as previously highlighted, but skimmed the site quickly, looking for information rapidly. Skimming appeared to work for Allan as he moved the mouse up and down the page. At one point, he skipped a question and moved on to another one because he had located information pertinent to answering the other question.

Prior Knowledge.

Different than the previous two participants, Allan used tapping into his prior knowledge quite a bit of the time during this first session. In fact, it accounted for eighteen percent of the strategies he used while looking for information on Ancient Egypt. The primary reason for the high percentage was Allan’s recent introduction to King Tut through his art teacher. A few seconds later, Allan selected the link entitled
“Ancient Art,” because he remembered seeing mummy masks when he had looked at the link before. He also used this strategy when he selected “Treasures” when looking for what might be in the tomb. Allan commented, “Because it was right before tomb; the treasure that might be in the tomb.”

Session two strategies used

Allan used matching skills, navigating, prior knowledge, and reading word for word as his primary Internet reading strategies. However, because guessing and making inferences occurred only one time less than matching skills, the researcher felt it was important to discuss how Allan used them, labeling them secondary strategies.

Table 13

Session Two Strategies Used by Allan

<table>
<thead>
<tr>
<th>Code</th>
<th>Times used</th>
<th>Percentage of total strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining importance (DI)</td>
<td>4</td>
<td>7%</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>5</td>
<td>8%</td>
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<td>Making Inferences (MI)</td>
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<td>8%</td>
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<tr>
<td>Matching Skills (MS)</td>
<td>6</td>
<td>10%</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>8</td>
<td>13%</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>13</td>
<td>21%</td>
</tr>
<tr>
<td>Off Task – no reading strategy (OT)</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>6</td>
<td>10%</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>7</td>
<td>11%</td>
</tr>
<tr>
<td>Researcher Intervention</td>
<td>4</td>
<td>7%</td>
</tr>
<tr>
<td><strong>TOTAL NUMBER OF STRATEGIES USED</strong></td>
<td><strong>61</strong></td>
<td></td>
</tr>
</tbody>
</table>

Matching skills.

Throughout the session that required him to investigate the Soviet Union, Allan used matching skills six different times, or ten percent of the session. These matching skills were demonstrated as Allan skimmed, looking for key words from the questions to
appear in the text. Quickly, Allan matched “Stalin changes the Soviet Society” to part of a question the researcher had posed. He seemed pleased and said, “As… right here; so right here.” Later, he continued to look for the Cold War, he said, “Mm. I’m just looking for Cold, the…” At that point he stopped mid-sentence and began to skim. When the researcher asked if he were reading word for word, Allan said, “No, because I found cold War,” and he continued to read the text, offering an answer.

**Monitoring understanding.**

Monitoring his understanding was clearly one of the strategies Allan used effectively, and during this session, he used the strategy thirteen percent of the time. This was best demonstrated in the second session when he read word for word several times, checking to make sure he understood the content before moving to the next section or offering an answer. When he continued to search for information that he seemed to have already found, the researcher asked him why he was still searching. He answered, “To see if there’s anything more about who else lived in it. Let’s see…” Instead of being finished when the researcher seemed to indicate he could be finished, Allan continued to look for information, double checking whether he had understood the content enough to fully answer the question. Later in the second session, he continued to monitor his understanding when he stated, “That doesn’t tell me anything!”

**Navigating.**

Twenty-one percent of Allan’s strategies used during session one involved navigating. He seemed quite used to scrolled and clicking in web sites and this one posed little trouble other than being able to pronounce words. Not only did he use the search box during this session, typing in the entire question, but at one point he tried to use the
dictionary tool as he struggled with the word philosophic. He whispered, “Sometimes there’s a dictionary down here. Document. Wrong thing.” Interestingly, at one point, Allan said, “Let’s see. This is about, they… uh… can I go to like wikianswers.com?” He admitted that he often relies on sites like wikianswers.com to locate information. Most of the time, however, Allan simply scrolled through the pages, looking for key words.

_Prior knowledge._

Just as in the previous session, Allan used prior knowledge a few times during this second session. In fact, ten percent of the strategies Allan used related to tapping into prior knowledge. At one point, however, what Allan thought was prior knowledge actually led him astray. He offered what he thought was the answer; Allan elaborately explained, “And they thought Great Bit—Britain was going to attack right there so they had like most of their troops right there, but since the Great Britain had a lot of rubber explosives, rubber models of everything, they had the, the use of target practice so they stuck those on old, rusted ships that still worked that they didn’t need anymore and then to make them think that they had big, rubber cannons….” This answer continued for quite awhile, and then the researcher asked him a clarifying question that turned his attention to the text. After reading a bit more when the researcher pushed him to explore the page, he realized he was really thinking of World War II, not the Cold War.

_Reading word for word._

Eleven percent of this session’s strategies involved Allan reading word for word. In fact, until he grew accustomed to the format of the page, he used this strategy four out of the first seven decisions he made while reading. At first he decided to click on a
button that matched the word he was exploring, and then he said, “He was the second leader of the Soviet Union. He was also known as Koba. The name Stalin differed from combining …” and he continued to read out loud to the researcher. A few seconds later as he looked for the changes made to the Soviet society, Allan read, “He replaced a socioeconomic policy with a five year plan, which called for highly ambitious program of stage guided…” At this point, he ran into difficult and unfamiliar words. He looked to the researcher for help. Reading word for word seemed to be a practice that Allan relied on when he wasn’t finding things that jumped out at him quickly. As he read, he was able to hear the text and then suggest answers to the questions.

Secondary strategies.

While most of the sessions do not require an additional strategies section, like Konrad, Allan too used a few other strategies that didn’t necessarily warrant being considered primary strategies, but they do require mentioning. Eight percent of the strategies included guessing as did another eight percent included making inferences. Even though Allan was a confident reader, he did attempt to make a few guesses throughout this session. The best example happened when he searched for the number of republics in the Soviet Union. He said, “Well… I do not remember what it was, so…” and here he typed in the search box. Mmmm. I spelled it wrong. Looks like two div-- two of them. Because it says two divisions in South, in the Southern Soviet Socialist Republic, so I’m guessing there is two div--two of them.” At that point, he really didn’t have an understanding of what he was even saying. The other secondary strategy included making inferences. In this case, Allan had to read between the lines. For example, as he looked for the year that the Soviet Union fell apart, he said, “No. Welp.
Not in here. 1922 until 1991, so I guess it was 1991.” This was the correct date and while he didn’t read that date in the text, he did surmise that was the date because of the heading.

Session three strategies used.

For this final session, Allan used evenly distributed the strategies he employed while reading the web site on the climate. He used determining importance, making inferences, monitoring understanding, and navigating. Because Allan was also off task for part of the time or was not using identifiable reading strategies, the off task category made the high frequency list. Interestingly, four of the five most frequent strategies were used the same percentage of the time: thirteen percent.

Table 14

Session Three Strategies Used by Allan

<table>
<thead>
<tr>
<th>Code</th>
<th>Times used</th>
<th>Percentage of total strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining Importance (DI)</td>
<td>3</td>
<td>13%</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>Making Inferences (MI)</td>
<td>3</td>
<td>13%</td>
</tr>
<tr>
<td>Matching Skills (MS)</td>
<td>2</td>
<td>9%</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>3</td>
<td>13%</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>4</td>
<td>17%</td>
</tr>
<tr>
<td>Off Task – no reading strategy (OT)</td>
<td>3</td>
<td>13%</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>Researcher Intervention</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td><strong>TOTAL NUMBER OF STRATEGIES USED</strong></td>
<td><strong>23</strong></td>
<td></td>
</tr>
</tbody>
</table>

Determining importance.

The first strategy, determining importance, occurred thirteen percent of the time, and it involved Allan making decisions about the worth or value of a link. He had to
decide if the link would take him to a section that would contain the answer. Initially, Allan quickly selected a link that was a question “What is the big deal with carbon?” He chose this link because he knew that having carbon is important, and he determined that this would most likely point out what was important about it. At another point in the session, Allan selected a button because he hoped that it would provide him with the answer. He said, I’m going to select this one [link] because maybe it’ll say it. I know what climate change is.”

Making inferences.

Due to the nature of the web site and perhaps the questions, Allan had to make inferences thirteen percent of the time he made a decision to change directions in the search. Making inferences included locating information that didn’t necessarily corroborate what he believed to be the answer. At one point, he exclaimed, “Ah, ha!” When the researcher asked him why he said, “Ah, ha,” Allan responded, “I found what make… I found what makes it up, but not really what I was thinking of. Well, it says CO2 is really important. Oh, my gosh!” He used his reasoning skills to read between the lines as he interpreted the text.

Monitoring understanding.

Throughout this session, Allan also monitored his understanding thirteen percent of the time. For example, he commented, “I didn’t think that would be in here, like countries like India.” Even though he had selected the link, he was surprised that the link had helped him understand the question. At another point in the session, Allan had read part of the text out loud as though it might be the answer, but then he said, “mmm.. no. Yeah, right here. Uhm, how does carbon get into living things I guess. A plant takes in
CO2…” and he continued with the answer. At first, though, he had questioned whether the link had provided him with important information; quickly, though, he had determined that it had given him the right answer or enough to formulate his own answer.

_Navigating._

Like so many of the sessions, navigating again appeared as a frequent strategy Allan used. For this session, Allan used it seventeen percent of the time. As was typical in the other two sessions for Allan, this session recorded him scrolling up and down the pages, looking for key information or hyperlinked words. In this session, he clicked quickly on the choices at first, but later had to return to the start, explaining, “I’m going to Home.” When the researcher asked him why he made that decision, he responded, “Because there is something on climate, I think.” Navigating this page was not as easy for Allan as the previous two pages. He grew frustrated when he couldn’t quickly find the answers. He anticipated that it would be easy because it the content covered information with which he was familiar and the opening page seemed a bit more elementary than the previous page.

_Off Task- No reading strategy used._

The third session found Allan a bit more frustrated than the previous two sessions and this may be the reason he had thirteen percent of the decisions recorded as off-task or using no reading strategies. At one point, when he was struggling to find information quickly regarding the definition of climate change, he guessed at the answer, and he said to the researcher, “Uhmm. I just do not want to look for it.” He continued with “I can’t find it on here, but I think it’s in this part, thought.” His frustration mounted until the
researcher intervened and reminded him that he could skip the question for the time being and look for an answer to another question.

**General comments.**

As the sessions ended, Allan discussed his experiences of reading on the Internet. Interestingly, he commented that he feels he reads more on the Internet, but regardless of the medium, if the homework asks for simply finding information on the page, he simply skims both textbook and Internet sources. Allan also commented, “It’s different because I skim in a book because like sometimes I know where it is, like between three pages, I know like it gets in there somewhere, and most of time it’s highlighted on what words we have. And then on the Internet, I have to look a lot more because I have to read a lot of things on it and try and find it.”

**“Flounders”**

**Laurel.**

Laurel was a twelve-year-old Caucasian female who provided a different perspective to the Internet reading sessions because she had an identified exceptionality. The reading teacher commented that Laurel loved to read the books she selected, and she “endured” the teacher’s selections. With her identified exceptionalities, Laurel sometimes had difficulty interacting with her peers in her reading group, but because the teacher expected her to participate in the groups, Laurel performed. Even though recording outside reading each month was required, according to the classroom teacher, Laurel often did not turn in her reading log; therefore, the teacher seldom knew how much actual outside reading Laurel did. While Laurel earned a Pass Plus on her spring 2010 ISTEP+ test in English/Language Arts with a score of 582, her NWEA winter and
spring 2010 scores illustrated a declining performance trend. In the winter, Laurel’s RIT score was a 218 which fell in the sixty-first percentile. The spring administration of the NWEA, however, recorded a substantial drop: a RIT of 215, placing her in the forty-eighth percentile. Laurel’s mother and classroom teacher indicated that she had an identified disability. Upon further investigation, the teacher of record said that the participant had been diagnosed with Aspergers through a psychologist who had evaluated Laurel when she was younger. The educational psychologist employed by the school system did not identify the Aspergers, but she did document an Emotional Disability. In a follow-up email, the teacher of record clarified that during the case conference, the committee agreed that she did not qualify for the Aspergers, but that modifications would be made for the Emotional Disability. According to the teacher of record, “during the two years that I had her, she did have a couple of quirky habits that screamed Aspergers, but overall, she was very emotional…She is a great girl, but is quite puzzling!” While Laurel was the only participant in this study with a documented disability, it was important to include her. The researcher could not make generalizations for a broader population, but including Laurel in the research represents the importance and uniqueness students with exceptionalities provide the classroom and the challenges having such a diverse group of learners might pose for a classroom teacher.

**Questionnaire responses.**

As Laurel completed the questionnaire, she self-reported that she spends approximately three hours each week on the Internet, using it primarily to play games. When she looks for information on the Internet, she indicated that she first uses the Google search engine. Then she types the word she wants to find. When asked to self-
assess her ability to find information on the Internet, Laurel circled a four, placing her
between good and excellent. When it comes to reading printed texts, Laurel reported that
she was excellent, but only good at reading Internet material. Her confidence in her
ability to think out loud with the researcher was high, as she circled five indicating she
was extremely comfortable with talking to the researcher about her thoughts as she read.

Table 15

*Online Reading Behaviors for Laurel*

<table>
<thead>
<tr>
<th></th>
<th>Session #1</th>
<th>Session #2</th>
<th>Session #3</th>
<th>Overall Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining Importance (DI)</td>
<td>5%</td>
<td>5%</td>
<td>14%</td>
<td>8%</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>0%</td>
<td>9%</td>
<td>6%</td>
<td>5%</td>
</tr>
<tr>
<td>Making Inferences (MI)</td>
<td>5%</td>
<td>5%</td>
<td>6%</td>
<td>5%</td>
</tr>
<tr>
<td>Matching Skills (MS)</td>
<td>16%</td>
<td>7%</td>
<td>0%</td>
<td>8%</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>9%</td>
<td>32%</td>
<td>34%</td>
<td>25%</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>16%</td>
<td>5%</td>
<td>9%</td>
<td>10%</td>
</tr>
<tr>
<td>Off Task – no reading strategy (OT)</td>
<td>21%</td>
<td>14%</td>
<td>17%</td>
<td>17%</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>9%</td>
<td>0%</td>
<td>3%</td>
<td>4%</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>5%</td>
<td>0%</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>13%</td>
<td>9%</td>
<td>6%</td>
<td>9%</td>
</tr>
<tr>
<td>Researcher Intervention</td>
<td>0%</td>
<td>18%</td>
<td>6%</td>
<td>8%</td>
</tr>
</tbody>
</table>

*Sample transcript taken from session one.*

R: Let’s do the next one. In what year did work on the Royal tomb begin? Where are you going to go and why?

S: [Scrolled down and hovered over royal tomb. Didn’t say anything] I saw royal tomb and royal tomb. [Moved cursor across words quickly and hummed.]

R: Are you reading word for word or skimming.

S: [Skimming.] I skip the parts I do not need. If it had nothing to do with the information … I need to know where to begin… I just skip it. Most of the time kids look up this stuff is if it’s for a project.

In the last 100 year – millennia – Ah, rock cut! [Extremely distracted! Stopped to read word for word].
The tomb is yet another example of how the condition of ancient monuments has deteriorated more in the last 100 years than in the previous three millennia.

Blah – blah – Blah [scrolled down]. I scanned to find numbers.

R: Does it make sense? What happens if you can’t find it on this page.

S: I do not know. I usually find it by now. [Clicked back to the previous page- cursor landed on royal tomb again – but avoided it since last time]

R: Do you want to move on? Why did rulers in Ancient Egypt have statues of themselves built?

S: Scrolled across the button selections (menu). Read a few out loud King List, blah, blah, blah. Hey look Sculpture.

R: Okay. Why are you clicking sculpture?

S: Statues and sculpture – not that different! To leave their mark in history – it’s right there. Something tells me that ain’t going to be there that long.

R: When people think of Ancient Egypt, they think of their art, especially the mummy mask. Whose mask is the most famous?

S: I was going to answer King Tut. Either that or Cleopatra, even though she’s not fully Egyptian.

R: Where would you go to find that answer.

S: Blah-blah-blah

R: What are you thinking? Why are you looking at those? [pictures of masks]

S: Went back to the buttons – Faces of the dead! If they are dead, they need something to keep them from getting all pimply. Let’s see… jewelry, amulets. Did you say masks? MASKS! Mummy masks – faces of the dead. Perfect! Not very specific…I want to know who has the MOST famous mask. As well as the famous golden mask of Tutankhamun and the less well known solid gold mask of Psusennes there are several other masks on display in collections throughout the world.

Sixth graders know about Tutankhamun because of the recent field trip. They got to go to the museum to see it, plus we drew a picture.
Session one strategies used

Laurel’s behavior was immediately different during this first session than the other participants in the study. She was distracted and off task from the very beginning. Therefore, her most frequently used category was the off task category with no reading strategy being employed. Laurel also used matching skills and navigating followed by reading word for word.

Table 16

<table>
<thead>
<tr>
<th>Code</th>
<th>Times used</th>
<th>Percentage of total strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining importance (DI)</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Making Inferences (MI)</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Matching Skills (MS)</td>
<td>9</td>
<td>16%</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>5</td>
<td>9%</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>9</td>
<td>16%</td>
</tr>
<tr>
<td>Off Task – no reading strategy (OT)</td>
<td>12</td>
<td>21%</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>5</td>
<td>9%</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>7</td>
<td>13%</td>
</tr>
<tr>
<td>Researcher Intervention</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>TOTAL NUMBER OF STRATEGIES USED</strong></td>
<td><strong>56</strong></td>
<td></td>
</tr>
</tbody>
</table>

Matching skills.

As Laurel made her way through this first session, she used matching skills sixteen percent of the time. At one point, Laurel commented, “Well, I get mad whenever I can’t find the link I want so if they want something specific then they want very specific.” In other words, she needed to find a word in the web site that matched the word in the question. She seemed quite pleased when she easily found the answer in the text. Early in this first session, she said, “Well, clearly this is going to answer that” in
reference to identifying Akhenaton. She confidently read each word, “He was the ruler of Egypt during the period known as the 18th Dynasty.” She continued to keep reading for another minute without realizing she had read much more than she needed. Later, as she skimmed the web site looking for highlighted links, she exclaimed, “Did you say masks? MASKS! Mummy masks—faces of the dead! Perfect!” Here she had matched a key word to one in the question as she stumbled upon the information.

Navigating.

Like the other participants, Laurel used navigating quite naturally, using it sixteen percent of the time. Laurel’s navigating strategies involved her scrolling over the links, making informed decisions to keep moving around the page. She used the back buttons frequently and clicked quickly when she could not find information fast. At another point in the session, she hovered her mouse over the picture to see if additional information about the picture popped out of the text. Unlike her peers, however, Laurel didn’t seem to navigate as easily as the others. Instead, she relied heavily on looking simply for key words. She did use the buttons and was able to scroll throughout the pages, but she did not use the search box as a few of the others had.

Off task – no reading strategy.

Throughout this session, Laurel provided ample examples of offering unrelated thoughts or unsolicited constructive criticism about the web page or about the research project in general. Twenty-one percent of her reading decisions could be characterized as off-task or using no reading strategy. The researcher allowed her to work and follow her thoughts with little interruption. In fact, the researcher simply asked clarifying questions and did not redirect her attention primarily because there was not an opportunity to do so.
Each time Laurel wandered off task, she quickly redirected herself when she caught a glimpse of what she thought was the answer. During this first session, for example, she exclaimed, “Even then there were bees—ooohlalalala?” The statement had nothing to do with her search for information about the most famous mask in Ancient Egypt.

*Reading word for word.*

Several times throughout this session, Laurel read each word carefully. In fact, this strategy accounted for thirteen percent of the strategies used during the first session. As mentioned in the section regarding matching skills, Laurel tended to read rather large sections of text out loud without monitoring whether she was finding the answer or not. Not long after she had read out loud the information about Akhenaton, she read information about the tomb’s contents, reading, “Ancient Egyptian furniture makers displayed some particularly advanced techniques in their craft. As well as their well-documented ability with working precious metals…” Unfortunately, Laurel didn’t seem to understand when to stop reading or whether she had answered the question with the text she had just read out loud.

*Session two strategies used*

As Laurel completed the second session, she relied on navigating. Again, however, Laurel was off task, and during this second session, as a result of her off task behavior, the researcher intervened quite often. Thus, the off task category for Laurel was thirty-two percent, and the researcher intervention category accounted for eighteen percent of the reading directions. In this case, then, the researcher decided to add discussion regarding two other strategies, guessing and reading word for word, that Laurel seemed to use part of the time.
Table 17

*Session Two Strategies Used by Laurel*

<table>
<thead>
<tr>
<th>Code</th>
<th>Times used</th>
<th>Percentage of total strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining importance (DI)</td>
<td>2</td>
<td>5%</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>5</td>
<td>9%</td>
</tr>
<tr>
<td>Making Inferences (MI)</td>
<td>2</td>
<td>5%</td>
</tr>
<tr>
<td>Matching Skills (MS)</td>
<td>4</td>
<td>7%</td>
</tr>
<tr>
<td>Off task (M) OFF TASK</td>
<td>18</td>
<td>32%</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>8</td>
<td>14%</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>5</td>
<td>9%</td>
</tr>
<tr>
<td>Researcher Intervention</td>
<td>10</td>
<td>18%</td>
</tr>
<tr>
<td><strong>TOTAL NUMBER OF STRATEGIES USED</strong></td>
<td><strong>57</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Off task – no reading strategy.*

Thirty-two percent of the reading strategies used in this particular section included those decisions that took her completely off-task, such as random thoughts or outbursts. For example, early in the session, Laurel commented, “Yeah. I just hope I do not get too bored or else I won’t be thinking.” Laurel’s off-task category was by far the largest category in this session, and the researcher suspects this is so because of the nature of the web site as well as the content. After discussion with Laurel’s special education teacher, the researcher believes that her identified exceptionality may play a role in this reading behavior. Her ability to process information quickly seemed challenged at times when she didn’t know which direction in the web site to follow. At one point, as she searched for how Joseph Stalin changed the Soviet Society, she began scrolling through the page and suddenly said, “You see, most of the kids in my grade, most of the boys in my grade, they technically, they have, they have the attention span of
a cocker spaniel, so if it’s not interesting, they zone out completely.” Another great example of how distracted Laurel was happened when she said” They are like one of those dead people, except with their eyes open. You know, kind of what it looks like when you cut off a fish’s head.” Physically, she was distracted throughout the session, looking out the window, fidgeting in the chair, or turning to look at the researcher in funny ways.

Navigating.

Another strategy Laurel used during this session involved navigating, and she used this strategy fourteen percent of the session. In her case, there appeared a close relationship between navigating and guessing or navigating and matching word for word. For example, she clicked on the highlighted phrase Great Purge. When asked why she selected that link, she responded, “Because you asked what the Great Purge was or what the Purge was,” and she continued to scroll up and down without reading the text before her. Shortly thereafter, she seemed off task while navigating. At that point, she said, “Blah, blah, blah, blah,” and mumbled some inaudible words while browsing the words on the page. Finally, she selected the link that read demographics. Repeatedly throughout the second session, Laurel literally just scrolled through the pages looking for key words to jump out at her. She approached her reading with no plan of action.

Researcher intervention.

While this category does not really stand as a reading strategy, it does indicate that an outside person had to redirect the reader’s attention. In a classroom setting, this person would be the teacher. Because eighteen percent of Laurel’s actions resulted in the researcher redirecting her attention, the researcher felt it warranted discussion. As
previously mentioned, Laurel’s exceptionality may play a role in how she interacts with others; it is difficult to tell if she has this same distraction when reading without the presence of a researcher or at least in this particular study. An excellent example of this situation occurred when Laurel began discussing the researcher taking field notes. She started to answer the question about the Soviet Union falling apart, but as she attempted to answer, she suddenly said, “Are you literally writing down everything I tell you?” This question was quickly followed with “Because my math teacher, one of my math teacher’s assistants, she writes every down, down every single word she says.” The researcher tried to refocus Laurel by saying, “Hmmm. There’s a better answer.” “Good point, good point,” Laurel replied and then stumbled through the text looking for the answer.

Other strategies.

While they were not used as frequently as the strategies just discussed, the researcher feels Laurel’s use of two other strategies require some attention. Throughout the second session, Laurel used guessing and reading word for word in addition to the other strategies already discussed.

Guessing.

Nine percent of the coded actions in the transcripts revealed Laurel used guessing. At one point, Laurel even said, “Well, I suspect yes,” when the researcher asked her if her response was the answer. When the researcher probed further, Laurel had difficulty discussing her answer; it was clear to the researcher that she did not understand what she had just read. Instead, she was simply guessing at the answer to finish the task. She did not enjoy this particular topic of the Soviet Union, and Laurel made that pretty clear to
the researcher in several of her off task comments. Later, she responded, “I’m not an Albert Einstein. How should I know? Plus, I hear people in different counties speak many words, like in England, they say all these weird stuff. You know?” This particular response actually combines guessing with off task behavior. At another time, she was distracted by a word she found interesting and simply clicked on it to see what happened. Ultimately, she was not particularly interested in where the web site took her, but she continued scrolling through that page none-the-less. She was not sure where the link would lead her, but she followed it anyway out of curiosity or perhaps out of desperation. These behaviors were frequent in this second session.

Reading word for word.

Equally as important to guessing for Laurel was her reliance on reading word for word to locate an answer. Nine percent of the codes indicated that she used this strategy. For example, as she was scrolling up and down the page looking for changes in the Soviet Society, she suddenly saw words that matched the question and she read each word on the page out loud, “Stalin replaced it with a five year plan, which called for a heavy, ambitious program of state.” At this point, Laurel turned to the researcher making sure she knew that what she had just read out loud was the answer. Interestingly, Laurel was unable to tell the researcher what that meant, but seemed confident that the what she had just read word for word answered the researcher’s question because it contained similar words.

Session three strategies used.

As in the previous session, in the third reading session, Laurel again participated in off task behavior. Interestingly, though, she also used determining importance more
frequently than she had in the previous two sessions. In sessions one and two, Laurel appeared quite lost as she searched for information. She randomly selected links or answered the questions based on little deliberate action. In this session, however, something was a bit different. Laurel often considered the choices in the web page and appeared to make judgments about whether the links would take her in an important direction. Like the other three sessions, though, she also participated in off task behavior. None-the-less, this session did indicate that Laurel used strategies she hadn’t used as frequently in the previous two sessions.

Table 18

Session Three Strategies Used by Laurel

<table>
<thead>
<tr>
<th>Code</th>
<th>Times used</th>
<th>Percentage of total strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining importance (DI)</td>
<td>5</td>
<td>14%</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td>Making Inferences (MI)</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td>Matching Skills (MS)</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Off task (M) OFF TASK</td>
<td>12</td>
<td>34%</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>3</td>
<td>9%</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>6</td>
<td>17%</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>1</td>
<td>3%</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td>Researcher Intervention</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td><strong>TOTAL NUMBER OF STRATEGIES USED</strong></td>
<td><strong>35</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Determining importance*

Fourteen percent of Laurel’s coded decisions indicated that she determined the importance of the link as she worked her way through the web page. Instead of randomly selecting directions, Laurel appeared in this session to look more carefully at the choices before making a decision. One of the best examples of determining importance occurred
when Laurel she looked at two links and said, “This is talking about the whole planet; it’s not talking about something specific.” At this point, she selected another direction after determining the importance of the one link over the other. Later, she selected a link and said, “Maybe we’ll get to India soon. I think we’re getting somewhere, ehh?” While this session did not last as long as the others because Laurel was able to navigate her way through the site with greater ease than the other two, she did make important decisions about the choices she faced throughout the navigation.

Important to understanding the complexity of Laurel’s behavior is the fact that she seemed unable to fully monitor her understanding once she determined the importance of a link. For example, as she looked as various hyperlinks, she selected one entitled Climate Tales. She thought it would take her to information about global warming and the climate. Instead, it took her to an animated film that lasted for five minutes. Even though she knew it probably was not giving her the information she needed to answer the question, she did back out of the link. Instead, she watched the short cartoon until the end.

*Off task – no reading strategy.*

Again, Laurel’s primary behavior during the reading session was to be completely off task, nearing thirty-four percent of session three. Even though she did employ the determining importance strategy more than she did in the first two sessions, she continued to struggle with keeping her attention on the research questions. It’s difficult to fully capture Laurel’s behavior in a narrative, but this excerpt from the transcripts provides a relatively accurate picture of her thought processes: “well, I do not see anything about India here. I can’t even find specific countries, on this thing. It’s very
frustrating. Home. Not India because we’re home and this isn’t India. And look, games. Not India. Big Questions. I do not really know about that. Climate Tales. Mmmmm. Earth Now. Education Resources. I do not know what these things mean. They hurt my brain.” Throughout the entire session, Laurel made off topic and sometimes off color comments. Again, it was difficult for the researcher to know if the behavior impacted the reading, was a result of not knowing how to read the Internet source, or was due to an inability to interact socially with the researcher.

Navigating.

Unlike the other sessions, Laurel appeared to navigate easily through the web site, using this strategy seventeen percent of session three. She quickly worked through the web site, scrolling quickly to look for key words. When she didn’t see something right away, she did express frustration, but she continued to navigate the site. After reading an entire paragraph out loud word for word, she said, “Well, I’ve technically answered this one (pointing to one of the researcher’s typed questions),” and she continued to scroll up and down the page. “Err. They do not really pop out,” she commented. “Come on, come on, come on. I know there has to be more than that.” Consistently throughout the session Laurel scrolled up and down the pages looking for words that matched words in the question or links she believed would provide her with an acceptable answer.

General comments.

Laurel did not hesitate to offer suggestions or thoughts on reading on the Internet. In fact, she incorporated these general comments throughout every session, so her feelings regarding the use of the Internet were integrated with other random, off task, comments. However, in the middle of the first session, Laurel did offer some important
insight into how she felt about reading online. She said, “I prefer to use books. It’s so easier to find the page you want, but on the computer, you have to, it, it’s like so difficult. There’s so many different links and you do not know which one you did yesterday or the day before, and you really want to find it, but there’s like thousands of them.” This small exchange clearly represents Laurel’s behavior through the sessions. She often seemed distracted by the page formats and unable to find what she wanted.

Jeremy.

Jeremy was a twelve-year-old, Caucasian male who was an average reader. As the reading teacher reported, Jeremy was able to keep up with his assignments and submitted solid academic work, but he only read when he was asked to read. As an outgoing person, Jeremy interacted well with his peers in his reading groups, but he did little reading other than what was required for the reading class. On his standardized tests, Jeremy did not perform as well as the other participants in the study. He did successfully pass the ISTEP+ test with a 433, but his NWEA scores declined dramatically between the winter and spring 2010 testing sessions. Jeremy’s winter RIT score was a 226, placing him in the eighty-sixth percentile. His spring RIT score, however, dropped to a 212, placing him only in the thirty-eighth percentile. The classroom reading teacher was shocked at the immense disparity in his test scores, and she had no explanation as to why they may have dropped. Jeremy does not have a documented disability.

Questionnaire responses.

Interestingly, Jeremy reported that he spends approximately twenty-four hours each week on the Internet, predominantly spending time on Facebook or in the search
engine Google. He said that when he looks for information on the Internet, he first goes to Google. Then he types in what he is looking for or researching. Even though he was one of the least skilled readers of the participant pool, Jeremy was extremely confident in his skills. He self-reported that he was excellent at finding information on the Internet, he was an excellent reader of printed text, and he was an excellent reader of Internet material. When asked to evaluate his comfort level with talking out loud as he read on the Internet, he circled the five or extremely comfortable rating.

Table 19

*Online Reading Behaviors for Jeremy*

<table>
<thead>
<tr>
<th></th>
<th>Session #1</th>
<th>Session #2</th>
<th>Session #3</th>
<th>Overall Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining Importance (DI)</td>
<td>10%</td>
<td>7%</td>
<td>16%</td>
<td>11%</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>6%</td>
<td>21%</td>
<td>16%</td>
<td>14%</td>
</tr>
<tr>
<td>Making Inferences (MI)</td>
<td>2%</td>
<td>2%</td>
<td>10%</td>
<td>5%</td>
</tr>
<tr>
<td>Matching Skills (MS)</td>
<td>10%</td>
<td>14%</td>
<td>10%</td>
<td>11%</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>18%</td>
<td>14%</td>
<td>6%</td>
<td>13%</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>24%</td>
<td>26%</td>
<td>19%</td>
<td>23%</td>
</tr>
<tr>
<td>Off Task – no reading strategy (OT)</td>
<td>8%</td>
<td>5%</td>
<td>3%</td>
<td>5%</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>4%</td>
<td>0%</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>4%</td>
<td>0%</td>
<td>10%</td>
<td>5%</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>8%</td>
<td>5%</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>Researcher Intervention</td>
<td>4%</td>
<td>7%</td>
<td>0%</td>
<td>4%</td>
</tr>
</tbody>
</table>

*Sample Transcript (Taken from Session One).*

R: Very good. Next one. In what year did work on the royal tomb begin?

S: I’m going to click on tombs and temples [had moved cursor along the button selections]

R: Why that one?

S: Because it talks about tombs and temples. [moved cursor up and down on page]

R: What are you thinking?
S: I can’t find the word tomb. The word isn’t there.
R: So the word royal tomb didn’t pop out at you?
S: No.
R: I’ll tell you. This one isn’t as easy as it looks. Remember, you can always skip and come back to it.
S: I’ll probably – I’ll probably click on Ancient Art.
R: Ancient Art? For the royal tomb? Are you still doing the royal tomb one?
S: No. I’m going on to another one.
R: Which one are you doing?
S: I think I’m doing this one [pointed at 4th question]
R: So when people think of Ancient Egypt, they think of their art, especially the mummy mask. And this one says whose mask is the most famous?
S: Tutankhamun – [Clicked on the picture; did not read words-Paused over the text at the top of the page.]
R: Are you finding the answer there?
S: No. [Paused – read text under large mask.]. It says right here.
R: Says what?
S: It says King Nebkheperura Tutankhamun remains the most famous of all the Pharaohs of Ancient Egypt.
R: Okay. Now did you click on him because you recognized his face?
S: Yeah.
R: and you already knew the answer?
S: Well, I just wasn’t sure…
R: so you thought you knew?
S: I just wanted to make sure. Now I am going to go... What’s this one?

R: It says King List.

S: I’m going to go to look for some of the things found King Tut’s tomb.

R: Okay. King Tut’s tomb. What are you looking for as you are scrolling down?

S: I’m looking for something that has to do with his tomb.

R: Are you reading each word or what are you doing?

S: Uhm, I’m reading this right now. [moved cursor over the paragraph at the bottom of the page]. It doesn’t really say anything about it. [clicked on tomb furniture - scrolled down – then back on tombs and temples]

R: Are you thinking you will find something there?

S: I’m hoping.

R: What are some of the things found in King Tut’s tomb?

S: I’m going to go to sculpture

R: Is that for the question you are looking at?

S: Ugh. Clicked on that by accident. [but didn’t go back – clicked on tomb– Very quiet – reading]

R: Did you just read that first paragraph? All of it?

S: Yeah.

R: Okay. Why did you read the whole thing?

S: Well, I was trying to see all of what kind of stuff was maybe in his tomb.

R: Did it say what was in his tomb?

S: uh, huh. It said at one point a small hole was discovered in the Valley of the Kings containing some storage jars and flower garlands.

R: Okay. But you’re not sure that’s the right answer?

S: yeah
R: How do you know that’s not the answer?
S: Well, because it said they found a small hole, so I do not know if there was a tomb or not.
R: It doesn’t sound like a whole lot and by the question?
S: Yeah, they probably found a lot and this doesn’t sound like it.
R: What did you just look at?
S: The picture.
R: You looked at the picture and then scrolled back up? Do you want to leave that question?
S: Yeah.
R: Okay. Why did rulers in Ancient Egypt have statues of themselves built?
S: [clicked on sculpture]
R: now why click on sculpture
S: because… uhmmm… ugh… it’s hard to explain
R: is it hard to think out loud?
S: yeah.

Session one strategies used.

Jeremy’s first session posed an interesting challenge for the researcher because he employed so many different strategies. He relied heavily on navigating which was illustrated as he scrolled up and down on the page and clicked on links quickly.

Monitoring understanding was his second most frequent used strategy, but then two other equally used strategies emerged: determining importance and matching skills. Because
he also read word for word and was off task for part of the session, the researcher felt she needed to include those two behaviors in the discussion.

Table 20  

*Session One Strategies Used by Jeremy*

<table>
<thead>
<tr>
<th>Code</th>
<th>Times used</th>
<th>Percentage of total strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining importance (DI)</td>
<td>5</td>
<td>10%</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>3</td>
<td>6%</td>
</tr>
<tr>
<td>Making Inferences (MI)</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Matching Skills (MS)</td>
<td>5</td>
<td>10%</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>9</td>
<td>18%</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>12</td>
<td>24%</td>
</tr>
<tr>
<td>Off Task (OT)</td>
<td>4</td>
<td>8%</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>4</td>
<td>8%</td>
</tr>
<tr>
<td>Researcher Intervention</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td><strong>TOTAL NUMBER OF STRATEGIES USED</strong></td>
<td><strong>49</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Determining importance.*

Throughout session one, Jeremy used several strategies equally, and determining importance was on used ten percent of the time. The other two strategies used ten percent were matching skills and prior knowledge. In this particular session, Jeremy made simultaneous decisions as he navigated the web site, evaluating the link quickly. For example, he moved the cursor along the button selections and said, “I’m going to click on tombs and temples.” When the researcher asked him why he was selecting that particular link, he said, “Because it talks about tombs and temples.” At that point, he couldn’t find what he was looking for and decided to skip the question. Again, he made a rather quick decision when he saw the words Ancient Art. He believed that link would
take him to information integral to answering a question he remembered the researcher asking at the beginning of the session.

*Matching skills.*

Another strategy Jeremy used ten percent of the time as he made his way through the web page was matching skills. As he navigated, he looked for specific words that matched words in the question. When Jeremy stated “I saw King Tut’s name and then I saw the word treasure,” he indicated the importance of this strategy for him. He knew he needed to find what was in King Tut’s tomb, so he matched those words. Instead of reading the text around those words, he simply clicked on the link. Frequently he exhibited this behavior, simply looking for a key word and ignoring others that didn’t match.

*Monitoring understanding.*

Important to Jeremy’s answering of the question was his ability to monitor his understanding. Eighteen percent of the time, Jeremy checked whether or not he understood what he was reading. This important strategy manifested itself when he said, “I’m still looking. I’m not sure,” and “I’m reading this right now. It doesn’t really say anything about it.” He made this last statement as he moved the cursor over the paragraph, reading the words carefully. Instead of simply matching the words as he had done previously, this strategy was an important one, for it demonstrated his ability to make sure he was providing the right answer. However, it should be pointed out that on occasion, Jeremy grew quite frustrated when he didn’t find the answer as he thought he would. When he did not understand the page or he couldn’t find the answer easily, he began to say uhm a lot and he fidgeted in the seat.
Navigating.

Jeremy used the navigating strategy the most; in fact, twenty-four percent of the strategies used, Jeremy relied on navigating. For Jeremy, navigating almost appeared to be a release of his nerves. He scrolled up and down on the page keeping himself busy. Frequently, he hovered his cursor over the words on the page, sometimes moving it slowly over each word. Then quickly he would change his mind and scroll down the entire page and then back up. For example, he clicked on the link Tomb Furniture, scrolled down rapidly, and without saying anything or stopping to visibly read the text, he clicked back on the link Tombs and Temples. Shortly thereafter he clicked on Sculpture and even though he said, “Ugh. Clicked on that by accident,” he continued to look in that section.

Secondary strategies.

While not as prevalent as the others, Jeremy did exhibit other behaviors besides the ones just discussed. Eight percent of the time he was off task and eight percent of the time he read word for word.

Off task – no reading strategy.

As the session progressed, Jeremy found it difficult to find the answers, and he struggled with some of the words. They were concepts for which he possessed no schema. Consequently, he grew more and more frustrated as he navigated his way through the web site. At one point, he sighed heavily. He admitted, “Mmmmmmmmmmm… I’m guessing,” and then he proceeded to scroll all over the page, up and down and then moving the cursor across the sentences. He didn’t make a decision, but sighed again. Here, he said that if he had been working on this as a
homework assignment, he would have abandoned the site and gone to another web site in
search of the answer. Even that response, however, seemed rather half-hearted as he
followed that statement with “I do not know. Maybe.” Then he admitted that he would
probably just guess on the answer to that particular question. Based on Jeremy’s
behavior, the researcher wondered if he was uncomfortable with the being asked to think
out loud or search for answers in front of the researcher. When she asked him why he
had made a choice, he said, “because…. Uhhmmmm… ugh… it’s hard to explain.” Her
field notes indicated that his body language expressed some discomfort during the
discussion; he squirmed in his seat and looked away from the researcher, avoiding eye
contact with her.

Read word for word.

Eight percent of the strategies Jeremy used in this first session involved reading
word for word. Jeremy used this strategy as he navigated the web site, and often as he
monitored his understanding. For example, he paused and read the text under one of the
pictures. Then he announced, “It says right here. It says King Nebkheperura
Tutankhamun remains the most famous of all the Pharaohs of Ancient Egypt.” Even
though the answer did not fully answer the question, the participant was satisfied with his
response. He did not stop to monitor his understanding; he believed he had an adequate
answer. Later, he returned to the strategy of reading word for word when he sat quietly
reading the text. When the researcher asked him what he was doing, he said responded
that he was reading every word. The researcher asked, “Did you read the whole thing?”
Jeremy replied, “Yeah. Well, I was trying to see all of what kind of stuff maybe was in
his tomb.” He took his time to read the text, not simply skimming and scrolling through the page. At this point, he deliberately read slowly, making sure he read for meaning.

**Session two strategies used.**

From the very beginning of this session, Jeremy struggled with the format of the web page. Because it was not set up as the one in the first session or like many of the web pages he probably visits, he struggled to make his way through the text. Therefore, it was not surprising that twenty-one percent of the strategies were guessing. He spent a lot of time navigating, or scrolling, through the text, and this strategy accounted for twenty-six percent of his decisions. The other two most frequent strategies Jeremy used in session two were matching skills and monitoring understanding.

Table 21

*Session Two Strategies Used by Jeremy*

<table>
<thead>
<tr>
<th>Code</th>
<th>Times used</th>
<th>Percentage of total strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining importance (DI)</td>
<td>3</td>
<td>7%</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>9</td>
<td>21%</td>
</tr>
<tr>
<td>Making Inferences (MI)</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Matching Skills (MS)</td>
<td>6</td>
<td>14%</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>6</td>
<td>14%</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>11</td>
<td>26%</td>
</tr>
<tr>
<td>Off Task (OT)</td>
<td>2</td>
<td>5%</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>2</td>
<td>5%</td>
</tr>
<tr>
<td>Researcher Intervention</td>
<td>3</td>
<td>7%</td>
</tr>
<tr>
<td><strong>TOTAL NUMBER OF STRATEGIES USED</strong></td>
<td>43</td>
<td></td>
</tr>
</tbody>
</table>

**Guessing.**

Without an understanding of how the web page was organized, Jeremy seemed confused from the onset of the session. In fact, as soon as the researcher finished reading
the questions to him, Jeremy asked, “So where do you click?” The researcher noted that he was thrown off by the fact that the page did not have typical buttons. After he scrolled down a bit, he realized there were highlighted words in a chart. Once he started navigating the page and looked for answers to the questions, he really struggled with the actual reading of the text. Twenty-one percent of the time he guessed at the answer or at which direction to go as he navigated. One of the best examples of this guessing behavior occurred when the researcher asked him if he was looking for something in particular. He responded, “ummmmm… just anything.” And even later, he answered another question with, “Yeah. The United States,” lacking great confidence in his answer.

*Matching skills.*

As Jeremy navigated the web site, he looked for specific words that matched words in the question. He said, “Well, I’m scrolling, stopping at the bold letters, and reading them.” Fourteen percent of the identified strategies involved matching the words in the text to words in the questions. When he successfully matched a word in the text with a word in the question, he often seemed surprised or excited. At one point in the session, he seemed a bit frustrated, and said, “I’m looking for something like,” and he mumbled a few words. “Stalin and the Soviet Union,” he clarified. Then he proceeded to read in silence, moving the cursor every once in awhile to the bold hyperlinked words. The researcher asked, “What are you thinking?” Jeremy responded, “I can’t find anything.” Immediately after that statement, Jeremy noticed text that seemed familiar to those in the question, and excitedly said, “Right here!” The researcher asked, “What did you recognize?” Jeremy replied, “I recognized the title like the words that I was looking
for,” and he continued to read quietly to himself, using the cursor to follow along the sentences.

**Monitoring understanding.**

Fourteen percent of the strategies Jeremy used in session two included monitoring his understanding. This behavior manifested itself when Jeremy stopped scrolling and read the text carefully. When he sighed, the researcher asked, “What are you thinking?” “Like… I just kind of read it and do not know if it like it just yet,” Jeremy commented. He thought he should find the answer in that part of the text, but it wasn’t surfacing quickly for him. Later in the session, He selected a link because it matched part of the question, but then he abandoned the link. When the researcher asked him why he was going back, he replied, “Cause I didn’t find anything.” Even though he had thought he would find an answer to the question, he knew after skimming the material the section was not helping his understanding. At that point, he had made a conscious decision to abandon the section of the site.

**Navigating.**

Perhaps linked to his frustration with the format of the web site, Jeremy’s navigating tendencies were quite high at twenty-six percent; however, this number may be somewhat misleading. Navigating includes scrolling up and down or random clicking on links, not just informed decisions. Because the format of the web site confused Jeremy, he tended to scroll up and down the web page aimlessly, simply looking for something to jump out at him. Sometimes he scrolled quickly; for example, he scrolled the mouse down to the bottom of the page and then back up to the top without stopping to read. Many times throughout this session, Jeremy used the mouse to jump to the bottom
of the page rapidly and then back up to the top never stopping to read the text. At other
times, he used the cursor to hover over hyperlinked words, moving it over the page with
little direction. His behavior when he used this strategy seemed rather haphazard, not
organized. He seemed to choose links because something caught his eye while he
scrolled rapidly.

**Session three strategies used**

When Jeremy first looked the web site being used for the third session, he seemed
relieved at the format, a much friendlier looking web site than the previous one. The site,
called *Climate Kids: NASA’s Eyes on Earth*, was obviously designed with kids in mind,
and Jeremy appeared physically relieved that from the onset it appeared different than the
previous web site the researcher had selected. Interestingly, Jeremy used determining
importance, guessing, and navigating throughout this session; these were somewhat
different than the strategies he used in the previous two sessions.

Table 22

**Session Three Strategies Used by Jeremy**

<table>
<thead>
<tr>
<th>Code</th>
<th>Times used</th>
<th>Percentage of total strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining importance (DI)</td>
<td>5</td>
<td>16%</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>5</td>
<td>16%</td>
</tr>
<tr>
<td>Making Inferences (MI)</td>
<td>3</td>
<td>10%</td>
</tr>
<tr>
<td>Matching Skills (MS)</td>
<td>3</td>
<td>10%</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>6</td>
<td>19%</td>
</tr>
<tr>
<td>Off Task (OT)</td>
<td>1</td>
<td>3%</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>1</td>
<td>3%</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>3</td>
<td>10%</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td>Researcher Intervention</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>TOTAL NUMBER OF STRATEGIES USED</strong></td>
<td><strong>31</strong></td>
<td></td>
</tr>
</tbody>
</table>
Determining importance.

Key to understanding the material, determining importance is an important reading strategy. Jeremy used this strategy sixteen percent of his behaviors as he searched the climate related web site. He slowed down as he hovered his mouse over the choices of buttons and hyperlinked words. Early in the session, he quickly looked at the choices, and then he selected the hyperlink that read, “What is the big deal about carbon?” He believed it would help him understand the importance of carbon, one of the first questions asked. Several times throughout the session, Jeremy made conscious decisions of which hyperlink to follow. Not only did he tell the researcher he was trying to determine if the link was important to his understanding of the material, but his facial expressions demonstrated a change in his approach to the search. Jeremy’s approach to this web site was much different than how he approached the web site which dealt with the former Soviet Union. As he looked for the answers to the questions, he did so much more confidently, not wandering aimlessly. He comfortably looked at the text and made decisions easily.

Guessing.

While Jeremy did approach this session with much more confidence, he still guessed sixteen percent of the time as well. The guesses, however, dealt more with whether the text he had read really answered the question. Typical of this behavior, Jeremy’s responses included “uh, I think they do because the harsh winters are slowing down global warming or it’s just going backwards.” At this point, he had read both the text word for word and looked at the related graphics. Frequently, Jeremy started his
response, “I think…” and his tone was not as confident as it was when he found the answer easily.

Navigating

Nineteen percent of Jeremy’s behaviors involved navigating. The primary difference for this participant between this session and the previous session was the speed at which he navigated. In the previous session, Jeremy scrolled up and down the page rapidly, not stopping, and often with frustration. This web site, however, did not confuse him like the other had. His navigating behavior in this session showed Jeremy moving quickly to a link, he determined was important to his understanding. His navigating and determining importance strategies were used simultaneously. He scrolled to a link and quickly selected it.

General comments.

When discussing reading on the Internet in general, Jeremy offered several insights. He mentioned that typically the computer is easier to use when trying to find homework answers. “Because I like Google; it’s hard to explain,” he offered. Not only did this statement represent his computer usage, but it also demonstrated his inability to fully articulate his thoughts. This is something he struggled with more than the other participants. Then he changed his mind and said, “Actually, I think it might be easier out of a textbook. There aren’t so many pages. If you go on the Internet, you might have to go through a lot of pages.” Consistent in all three sessions, Jeremy exhibited comfort with the researcher before they began the reading sessions, but he found it difficult to articulate his thought processes. Conversations about his thinking did not come easily for him, and therefore, it was difficult to truly understand what he was thinking.
Section Two: Stances

The purpose of this study was to examine the strategies sixth graders used when they searched for answers in Internet sites. Although the researcher did not set out to look specifically at the differences of reading abilities or of reading behaviors in general, as she conducted the reading sessions over several weeks and then reviewed the tapes, field notes, and transcripts, an obvious pattern surfaced among the readers. These patterns focused specifically on the stances the readers took as they approached the reading sessions, and as a result, this section outlines the characteristics of those two stances: “navigators” and “flounders.” When the researcher compared the participants’ standardized test scores, she found a correlation between the standardized test results and the category in which the reader fell. The definition of flounder is to struggle or be in the dark and the definition of navigate is direct or plot a path. These defining terms provide a one word snapshot of the behavior participants exhibited as they read the Internet sources. While there is much to investigate with further research, the researcher felt it was important enough to warrant some discussion.

Categorizing “navigators” and “flounders.”

In order to show the differences between the participants, each of the five participants’ coded sessions has been included in a graph for each of the sessions; however, it is not easy to see a huge difference with the numbers. Instead, watching the behavior of the readers, the researcher’s field notes certainly demonstrated differences in their attitudes, approaches, or stances towards reading. Two of the participants in particular, Anne and Allan, certainly approached the reading sessions with more confidence and on task behavior than Jeremy and Laurel. Konrad was not as obvious
with his stance, sometimes appearing lost and other times navigating with great ease; overall, however, his stance towards reading on the Internet reflected many more characteristics demonstrated by Anne and Allan than they did Jeremy and Laurel; therefore, the researcher would put him in a similar category with Anne and Allan. Ultimately, the researcher saw enough differences that she created the categories “navigators” and “flounders” to help identify the overall stance the reader took towards the Internet site. These are not definitive categories, but rather categories that provide future research possibilities.

“Navigators.”

“Navigators” approached the Internet sessions with confidence and took little time to start searching the web site. These readers also used a variety of strategies easily and simultaneously. Both Anne and Allan, whose spring 2010 scores were the highest, appeared confident and more articulate about the topics and about their reading of new material on the Internet as the researcher would anticipate for skilled readers. For example, Anne often used several strategies rapidly and at the same time. At one point she continued to skim the material after she thought she had answered the question simply to see if there was more information she had missed or that would provide more depth to her answer. She verbalized “I’m going to push “back.” Wait. No, I’m going to go down to see if there was anything about how Stalin changed society. Never mind. I’m going to go back. I’m going to click back no Joseph Stalin.” Here she demonstrated a variety of strategies: navigating, determining importance, and monitoring understanding. Within a few seconds, she had made a decision, evaluated that decision, and changed her location in the web site. The speed at which Anne navigated this web
site as well as the others allowed her to move confidently through the site searching for answers. She did not exhibit the same frustration as the “flounders” exhibited as they made their way through the web sites.

In all three sessions, Anne consistently used similar strategies. She determined the importance of a link, navigated the web page, and monitored whether it added to her understanding of the content. During the third session, she admitted, “So far I’m not getting anything” and then she returned to the top of the page to see if there were better choices. In this particular web site which dealt with climate, Anne clicked on the link “Climate Tales,” which took her to an animated video. At first she thought it might provide her with some important information and she said, “This is very informative.” After watching another minute of the video, she seemed annoyed and commented, “This isn’t helping me.” As the video continued to play, Anne explored the buttons on the side bar trying to make a decision. Finally, she made a decision and said, “I hope this doesn’t take me back to the video” and she selected a link entitled “How do we know the climate is changing?”

Allan also exhibited similar characteristics. Because of his comfort with the Internet as well as his solid reading skills, Allan was able to quickly navigate the webpage and to make rapid judgment calls about whether a link would further his understanding or not. He used a variety of tools including the search box and dictionary tool. One of the strategies that Allan used frequently was making informed decisions or inferences based on his prior knowledge or his ability to monitor his understanding. During the third session, he seemed to guess a bit more than he did in the previous sessions, and he appeared more frustrated. When he could not find the information
quickly regarding the definition of climate change, he guessed at the answer, and he said to the researcher, “Ummmm. I just do not want to look for it.” He continued with “I can’t find it on here, but I think it’s in this part, though.” His frustration mounted until the researcher intervened and reminded him that he could skip the question for the time being and look for an answer to another question.

Monitoring his understanding was clearly one of the strategies Allan used effectively. This was best demonstrated in the second session when he read word for word several times, checking to make sure he understood the content before moving on. When he continued to search for information that he seemed to have already found, the researcher asked him why he was still searching. He answered, “to see if there’s anything more about who else lived in it. Let’s see…” Instead of being finished when the researcher seemed to indicate he was done, Allan continued to look for information, double checking whether or not he had found all the necessary information. Later in the second session, he continued to monitor his understanding, and he demonstrated this when he said, “That doesn’t tell me anything.”

Interestingly, Konrad exhibited some characteristics of both groups, but overall his behavior provided the researcher with a strong enough picture to place him in the “navigators” category. Konrad moved quickly through the web page, evaluating his choices rapidly by whether they added to his understanding or not. When asked if he was reading word for word, Konrad responded that he would read something word for word if it did not seem like a lot of reading. Throughout all three sessions, Konrad appeared excited to participate and he seemed at ease with the researcher, leaning back in the chair
at the computer as he looked at the pictures hanging on her office wall. He appeared comfortable and willing to work with the researcher.

In the second session, he did not go quickly to the search box as he did in the first session. This time, he skimmed looking for the green words. “I skimmed them green words looking for Joseph Stalin,” he reported to the researcher. Konrad’s initial method for locating information involved navigating the web page looking for hyperlinked words that he hoped would lead him to the right answers. Once he did find a word that matched a word in the question, he followed the link and then read that section word for word often using the cursor to underscore or even highlight the words as he read. It was nearly the end of the session that Konrad chose to use the search box to locate information. As in the first session, he seemed perplexed and a bit uncomfortable when he could not easily locate the answer to the question. He would read the test out loud, sigh, and then quickly scroll back to the top of the page.

Konrad monitored his understanding as he read. In the second Internet session, Konrad read a few of the sentences out loud. When the researcher asked, “So what would you write down? Would you write anything down at this point?” he replied “uhmmmm no… not if I’m not quite… If I’m like kind of sure but not…..” Here he stopped talking and continued to read until he felt he had located the answer to the question. He had evaluated or monitored his understanding that he did not have enough information to answer the question fully at the point when the researcher had asked him. Konrad made quite a few decisions rather hastily as he completed the second session. For example, he looked for key words, and when he did not see hyperlinked key words, he typed the word into the search box and within seconds evaluated the choices and
commented “I didn’t find anything.” When the researcher probed why he said he did not find anything, he replied, “I read like some of the words and they had nothing to do with like the end of the Cold War, and well, they said things like the leaders of the Cold War and so I would probably just go back to the Cold War since I didn’t finish it. To see if I missed something.” He returned to a previous page and started reading the text carefully, word for word.

Before Konrad began looking for information during the third Internet session, he skimmed the entire opening page and commented “I would probably scroll down here so I can see all what is on this page.” He continued to determine the importance of the choices he had available as he said, “I think carbon is kind of like air, so I’m just going to click air.” Then he selected the button to the right of the main picture frame. When the computer seemed too slow, Konrad quickly typed in carbon dioxide in the search box just as he had done in the first session. The navigating strategy of typing part or the entire question in the search box was a strategy exhibited by both Allan and Konrad and not the other three participants. These two young men seemed quite comfortable and familiar with this type of navigating strategy and seemed limited when the researcher would not let them search beyond the web site.

“Flounders.”

Jeremy and Laurel both demonstrated visible signs of discomfort in all three of the reading events, indicating a more difficult time reading the material. Their behavior was consistent with the actions the researcher anticipated would occur for less skilled readers. As just mentioned, Laurel frequently offered unrelated thoughts or unsolicited constructive criticism about the web pages or about the research project in general. The
researcher allowed Laurel to follow her thoughts with little interruption. In fact, the researcher simply asked clarifying questions and did not redirect her attention primarily because there was not an opportunity to do so. Each time Laurel got off task, she quickly redirected herself when she caught a glimpse of what she thought was the answer.

Laurel provided ample examples of this type of off-task behavior. For example, she randomly commented in the first session, “Well, I get mad whenever I can’t find the link I want so if they want something specific then they want very specific.” In other words, she needed to find a word in the web site that matched the word in the question. The fact that Laurel has Asperger’s may have impacted her responses to the researcher: “Even then there were bees – ooooolalalalala?” The statement had nothing to do with her search for information about the most famous mask in Ancient Egypt during the first Internet session. In the second session, Laurel made comments like “Yah, I just hope I do not get too bored or else I won’t be thinking” as she looked for information on the Soviet Union. These were just a few of the numerous random thoughts Laurel offered during the three individual Internet sessions. Laurel’s off task category was by far the largest category, sixteen percent during the first session, thirty-two percent during the second session, and thirty-four percent during the third session. The off task category was created to categorize those statements participants made that did not fit a reading strategy or that were not related to strategies at all.

In all three sessions, Laurel relied heavily on her ability to match words in the Internet text with related words in the questions posed by the researcher. She also relied on pictures, clicking on one at least three times in the first session. More importantly, Laurel appeared to not monitor her understanding, making off-topic comments when she
was confused. At one point during the second Internet session that dealt with the Soviet Union, the researcher asked her what the words she had just read out loud meant. Frustrated, Laurel responded, “It’s right there. I just read that.” When the researcher pushed just a bit more and asked if that was the answer, Laurel said, “Well, I suspect yes.” She was unable to talk about what she had just read out loud and had given as the answer to the question.

In the third session, Laurel continued to work without monitoring her understanding or evaluating whether or not selected links provided important information. Like the other participants researching the climate, Laurel selected the link “Climate Tales,” which opened an animated video of a polar bear and fish talking about the impact of global warming on their habitat. Instead of abandoning the video like the others did once they realized they were not gathering information, Laurel continued to watch, visibly mesmerized by the video. Once it ended, she did not comment on its ineffectiveness, but started guessing and trying to make loose connections to the questions that asked about events in India, the question for which she had been reading.

The greatest difference between this subject and the others was her apparent inability to select links based on their importance. Throughout this session, Laurel appeared to randomly select links that had little to do with the question she was trying to answer. For example, she clicked on links because they were interesting to her, rather than selecting ones she thought would lead her to a valid answer. At one point she clicked on the Great Purge because she was intrigued by the term “purge.” Upon examining the transcripts, the researcher could easily see how disjointed the reading process was for the subject. Laurel was truly distracted throughout most of the reading
session and many of her answers were guesses instead of researched and knowledgeable responses.

Jeremy, the other flounder, exhibited similar behavior. In all three Internet sessions, Jeremy appeared confused about how to search and read the web sites. Throughout his first session, Jeremy guessed three times simply because he was not sure of how to proceed. This was not an isolated example; he demonstrated this behavior frequently. Often he did not understand how to navigate the website even though he self-reported an extensive amount of time spent each week on the Internet at home. During the first session, he uttered “ugh” several times and seemed genuinely confused. The web page used for the second session, which focused on the Soviet Union (http://encyclopedia.kids.net.au/page/so/Soviet_Union), posed even more problems for him as he visibly struggled with being able to navigate the site. In fact, after the researcher had read the questions, Jeremy asked, “So where do you click” obviously not sure how to begin the search without a familiar format. The researcher’s field notes indicated that the subject “seemed a little thrown off by not having a typical web page in front of him; no buttons to click; he strained with this web site from the beginning of the session, confused by its format.” Even though the web page registered as a Flesch-Kindcaid grade level equivalent of a 6.07 (http://juicystudio.com/services/readability.php#readingresults), Jeremy struggled with the vocabulary and historical content despite the fact that his social studies class had just covered this topic.

In all three sessions, Jeremy seemed to read without direction. At one point in session one, he clicked on a link by accident while looking for information about King
Tut’s tomb; however, he did not return to the original page he had been reading. Instead, he read the new web page word for word to himself. He did know that the information he found was on the right track, but he did not think it was the right answer. Several times he relied on the pictures of the web site for the answer or he scrolled up and down without really examining the words on the page. Toward the end of the sessions, Jeremy began to get visibly frustrated. One transcript reported Jeremy uttering “mmmmmmmm – I’m guessing.” He scrolled quickly up and down without reading the text, claiming “I have no clue. I just want to see what’s there. Probably nothing.” During the second session, Jeremy’s body language and sporadic scrolling though the web site seemed to indicate he was uncomfortable. He sighed or squirmed in his chair because he was unable to locate the information quickly. The researcher asked him why he had said, “hmmmmmm,” and Jeremy replied “like it just doesn’t like to pop out at you right way. You just kind of read it and you do not know if it is like it just yet.” He seemed genuinely relieved when the researcher reminded him that he could skip a question and return to it at a later time. Frequently, Jeremy said “I do not know” as he navigated his way through the site looking for answers. However, he did know that he was not finding the right answer; therefore, he did demonstrate the use of monitoring understanding.

Unlike the other participants, Jeremy relied heavily on pictures which could be a characteristic of unskilled or poorer readers. In the third session, for example, several times Jeremy posed an answer after he “read” the picture, surmising the answer instead of actually reading it in the text. Jeremy relied as well on guessing at the answer to the question not only by reading the picture, but by also trying to pull things out of the text that made a little sense. Illustrating this point, during the third session, he said “Uhm
global warming… It gets just a hair warmer and they just start melting them. It might take awhile.” He had no clue if this response was the correct response, and it did not quite capture the intent of the text, but it was the best thing he could come up with for the researcher.

**Observed differences between “navigators” and “flounders.”**

Throughout the sessions, it became evident that the five participants had different stances towards reading the Internet sources. Initially, the researcher did not request the standardized test scores or reading grades for the participants. However, as she analyzed the data, the researcher began to notice differences in how the participants interacted with the web sites. At that point, she returned to the classroom teacher who provided the researcher with the winter and spring 2010 NWEA scores. Table 23 shows the relationships between the five participants for both set of scores. By looking at the positive behaviors the participants employed consistently as well as the NWEA scores, the three participants classified as “navigators” scored better on both the winter and spring NWEA tests. The two who seemed to approach the sessions with no direction or “flounder” had the lowest scores of the five participants; in fact, they were quite a bit lower.

Generally, the “navigators” approached the sessions with confidence and made decisions in their reading based on what they already knew about the topic and their familiarity with the format of the web page. They also seemed to use strategies that demonstrated their ability to quickly evaluate the importance of a link and make a decision that furthered their understanding of the material. At other times, “navigators” carefully monitored their understanding, realizing when they weren’t finding the answer
they needed to find. “Flounders,” on the other hand, approached the sessions in an
unorganized manner and seemed lost and off task from the beginning.

Table 23

*Distribution of Winter 2010 and Spring 2010 NWEA Scores for the Five Participants*

![Bar chart showing NWEA scores for five participants: Anne, Laurel, Jeremy, Konrad, and Allan.]

Table 24 indicates the collective percentage of each session the participants used a
particular strategy.

Table 24

*Strategy Comparison of Three Sessions*

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Session 1</th>
<th>Session 2</th>
<th>Session 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining importance</td>
<td>18%</td>
<td>9%</td>
<td>15%</td>
</tr>
<tr>
<td>Guessing</td>
<td>2%</td>
<td>8%</td>
<td>11%</td>
</tr>
<tr>
<td>Making inferences</td>
<td>4%</td>
<td>5%</td>
<td>15%</td>
</tr>
<tr>
<td>Matching skills</td>
<td>12%</td>
<td>10%</td>
<td>5%</td>
</tr>
<tr>
<td>Off task</td>
<td>9%</td>
<td>9%</td>
<td>11%</td>
</tr>
<tr>
<td>Monitoring Understanding</td>
<td>16%</td>
<td>12%</td>
<td>14%</td>
</tr>
<tr>
<td>Navigating</td>
<td>23%</td>
<td>21%</td>
<td>21%</td>
</tr>
<tr>
<td>Prior knowledge</td>
<td>7%</td>
<td>4%</td>
<td>2%</td>
</tr>
<tr>
<td>Read pictures</td>
<td>3%</td>
<td>0%</td>
<td>6%</td>
</tr>
<tr>
<td>Read word for word</td>
<td>7%</td>
<td>11%</td>
<td>10%</td>
</tr>
<tr>
<td>Researcher intervention</td>
<td>5%</td>
<td>7%</td>
<td>2%</td>
</tr>
</tbody>
</table>
In order to better understand the participants’ use of individual strategies, the researcher compiled the number of times each session that the participants used a particular strategy. Table 25 represents this data analysis.

Table 25

*A Comparison of Strategies per Participant for Sessions One, Two, and Three*

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Anne Sessions</th>
<th>Konrad Sessions</th>
<th>Allan Sessions</th>
<th>Laurel Sessions</th>
<th>Jeremy Sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining Importance</td>
<td>8  8  10</td>
<td>8  8  4</td>
<td>6  4  3</td>
<td>3  2  5</td>
<td>5  3  5</td>
</tr>
<tr>
<td>Guessing</td>
<td>0  1  1</td>
<td>0  1  2</td>
<td>1  5  1</td>
<td>0  5  2</td>
<td>3  9  5</td>
</tr>
<tr>
<td>Making Inferences</td>
<td>3  2  4</td>
<td>1  3  3</td>
<td>2  5  3</td>
<td>3  2  2</td>
<td>1  1  3</td>
</tr>
<tr>
<td>Matching Skills</td>
<td>6  3  3</td>
<td>6  7  0</td>
<td>4  6  3</td>
<td>9  4  12</td>
<td>5  6  1</td>
</tr>
<tr>
<td>Monitoring Understanding</td>
<td>14 8 11</td>
<td>9  7  5</td>
<td>5  8  3</td>
<td>5  3  2</td>
<td>9  6  2</td>
</tr>
<tr>
<td>Navigating</td>
<td>12 11 12</td>
<td>18 23 16</td>
<td>8  13 4</td>
<td>9  8  6</td>
<td>12 11 6</td>
</tr>
<tr>
<td>Off task</td>
<td>5  1  3</td>
<td>1  0  0</td>
<td>1  3  2</td>
<td>12 18 3</td>
<td>4  2  3</td>
</tr>
<tr>
<td>Prior Knowledge</td>
<td>3  2  0</td>
<td>2  3  1</td>
<td>7  6  1</td>
<td>5  0  1</td>
<td>2  0  1</td>
</tr>
<tr>
<td>Read Pictures</td>
<td>1  0  0</td>
<td>2  0  6</td>
<td>0  0  1</td>
<td>3  0  3</td>
<td>2  0  3</td>
</tr>
<tr>
<td>Read Word for Word</td>
<td>3  5  6</td>
<td>2  11 12</td>
<td>2  7  1</td>
<td>7  5  2</td>
<td>4  2  2</td>
</tr>
<tr>
<td>Researcher Intervention</td>
<td>3  1  0</td>
<td>3  2  0</td>
<td>4  4  1</td>
<td>1  0  10</td>
<td>0  2  3</td>
</tr>
</tbody>
</table>

**NOTE:** The researcher did not consider Laurel’s off task and researcher intervention numbers for the second session.

**Summary**

Through the reading of the transcripts and the field notes as well as through analysis of the data, the researcher was able to create a case study for each of the five participants. The behaviors or stances taken by each participant urged the researcher to categorize the readers into two distinct groups: navigators and flounders.
Chapter V: Analysis of Data

In order to add to the literature on reading strategies used for reading Internet sources, this study examined the reading strategies sixth-grade readers used when doing research on the Internet. This chapter summarizes the project’s results and compares the five case studies. The chapter begins with a summary of the Internet reading sessions, and concludes with the results of the study.

For this study, the researcher chose to use grounded theory which allowed the researcher to see “conceptual categories” emerge from the data (Grounded Theory Institute, 2008). According to the Grounded Theory Institute, grounded theory involves observation and interviews of participants. This study found grounded theory useful in exploring the reading strategies used by sixth-graders of varying reading abilities as they read for information on three different predetermined websites.

Internet Reading Sessions

Each reading session was completed during the spring of 2010 in the researcher’s office suite located on the campus of a small, private college. With the permission of the participants and their parents, the sessions were videotaped as well as recorded on the computer using the screen capture program Camtasia. This computer program was only used as a backup in case the videotape stopped working or the videotape was unable to capture the decisions made by the participants. The researcher only had to refer to the Camtasia screen captures three times during the fifteen sessions. Using the participants’ extra-curricular and school schedules, the parents of the participants and the researcher scheduled individual research sessions; as a result, they avoided scheduling conflicts and the participants typically arrived at the office shortly after school dismissed. Over a four
week period, the participants completed three individual sessions. The beginning of each session followed a similar format: after a short conversation about the participant’s day to help transition the participant from school to a different setting where s/he was videotaped and asked to think out loud to someone the participant did not know very well, the researcher answered questions regarding the research project or reminded the participant of the importance of thinking out loud. The researcher then read the directions to the participant, making sure to slowly read each question to the participant before s/he began using the assigned web pages. Frequently, through the conversation with the researcher, prior knowledge was activated for the participant. However, this was not done purposefully nor did it occur consistently for each of the sessions. For example, the first web site entitled “The Horizon to Ancient Egypt” asked participants to examine artifacts from Ancient Egypt (Appendix F). Interestingly, each of the five participants immediately drew a connection to King Tut because their art teacher had recently presented the treasures of King Tut, including his famous mask, to each of her art classes. This quick connection to their school work helped the participants feel more comfortable during the research session as well as more confident about their reading of the Internet site. During the second session, though, only twice did the participants recognize the name Soviet Union; the others had no recollection of their class having recently covered that topic in class despite the topic being linked to a state standard and included in their social studies textbook.

For each of the reading sessions, the participants were given a web site and a set of questions. Using a web site called Juicy Studio to determine the reading level of each web site, the researcher selected the following three web sites based on their readability,
their content which related to current state academic standards, and their varying formats. Requiring the participants to read information on Ancient Egypt (http://www.akhet.co.uk/), the first session provided participants with a traditional format: a colorful opening page with interactive buttons along the left sidebar and advertisements on the right sidebar. Participants appeared to have no visible trouble quickly deciding which direction to go when searching for answer; this web page represented those they typically used, and it had a Flesch-Kincaid grade level of 6.59 (http://juicystudio.com/services/readability.php#readingresults). Participants were asked to locate answers to the questions (1) Who was Akhenaton? (2) In what year did work on the Royal tomb begin? (3) Why did rulers in Ancient Egypt have statues of themselves built? (4) When people think of Ancient Egypt, they think of their art, especially the mummy mask. Whose mask is the most famous?

![Opening page for the first session-Ancient Egypt](image)

**Figure 1:** Opening page for the first session-Ancient Egypt
During the second session (Appendix G), participants explored information about the Soviet Union (http://encyclopedia.kids.net.au/page/so/Soviet_Union) on a web site that had a different structure than the first. Instead of interactive button selections that took the reader to different pages identified by tabs or buttons, the Soviet Union site simply contained an encyclopedia article on the Soviet Union with a table of contents. Even though the table of contents was similar to the interactive buttons, visually this web site did not reflect the typical format with which participants were familiar and a few of the participants were thrown off by the format. As was discussed in the case studies, a few of the participants, such as the “flounders” Laurel and Jeremy, struggled with this web site. The researcher surmised the difficulty began immediately when they were thrown off by a web site structure with which they were unfamiliar. Instead of being able to quickly adapt their schema, they floundered with making decisions and locating information. Spiro (2004) suggested that structures such as the one provided by the Soviet Union web site would create problems for readers if they were not supported by clear directions which was certainly the case for Laurel and Jeremy.

With a Flesch-Kindcaid grade level equivalent of a 6.07 (http://juicystudio.com/services/readability.php#readingresults), this web site met academic standards such as social studies 6.2.7: “Roles of Citizens: Define and compare citizenship and the citizen’s role in selected countries of Europe and the Americas.” Participants were asked to find the answers to these questions: (1) Who was Joseph Stalin? (2) What were some of Joseph Stalin’s names? (3) How did Stalin change the Soviet Union? (4) What ethnic groups lived in the Soviet Union? (5) How many republics made up the Soviet Union? (6) What countries were involved in the Cold War? (7) Why
was the Cold War fought? (8) What year did the Soviet Union fall apart? Again, several of the participants recognized the name of the country and thought they had talked about it in their social studies class, but none of the five participants was able to articulate his/her prior knowledge of the subject.

Figure 2: Opening page for the second session-Soviet Union

The final session (Appendix H) required the participants to examine a different content area, but still one that related to the sixth grade academic standards. Climate Kids (http://climate.nasa.gov/kids/) had content that met academic standards such as Science 6.3.11 “Identify and explain the effects of the ocean on climate,” and had a Flesh-Kincaid grade level score of 6.98 (http://juicystudio.com/services/readability.php#readingresults). The questions for this session included (1) Why is carbon important? (2) What is climate change? (3) How can
a little change in the temperature melt ice caps? (4) Is there a relationship between cold winters and global warming? (5) What is happening in countries like India? (6) How do researchers know global warming is happening? (7) What proof do they have?

Figure 3: Opening page for the third session-Climate Kids

Obviously, the three web sites had different formats and appeal to the participants, but all, according to the website used to determine reading levels, fit what could be expected of sixth-grade students. The five participants, though, ended up finding the web sites sometimes difficult to use as they searched for information, an observation that will be discussed in more detail in later analysis.

Transcript and Field Note Coding

In order to examine the strategies the participants used, the researcher transcribed each video-taped sessions, which each lasted anywhere from twenty-three minutes to
forty-four minutes. Initially, the researcher read through the individual transcripts without making any comments, simply to get an overview of how the sessions had progressed. Allowing several days to pass between readings, she reread each transcript marking each time the participant made a decision in the reading of the assigned web page; these decisions were identified as coding chunks. During this second reading, she used new transcripts and marked again the each time the participants made a reading decision. Two notated transcripts for each participant were then compared for similarities. Each transcript was read a third time with the researcher making notes regarding the type of decision the participant made in each coding chunk. This process was repeated for each of the fifteen transcripts. As suggested by grounded theory, the researcher was to approach the research with no preconceived thoughts about the situation, which in this case focused on the reading strategies sixth-grade participants used while reading on the Internet; instead, she allowed the themes to emerge from the research. Each time she read the transcript, the researcher wrote notes in the margins.

As the researcher read the transcripts, common themes grew evident in the strategies the participants used while reading the web sites. These common themes were grouped. Eventually, comparing her themes with the strategies identified by Pressley and Afflerbach (1995), including strategies in the pre-reading, during-reading, and post-reading phases, the researcher developed the final codes as indicated in Table 25; she then reread the transcripts marking the transcripts with the new codes used for the final analysis. For the purpose of this study, the following strategies were consider in relationship to the themes that emerged: reading from front-to-back (linearly); choosing to not read all of the sections; skimming; automatically reading until comprehension is
not occurring; reading aloud for comprehension; reviewing or restating what was just read to clarify or remember; making notes; taking time to reflect on what was just read; paraphrasing what was just read; looking for specific words, concepts or ideas; examining the text for patterns; predicting what will happen in the text; and re-establishing reading goals as the reading occurs. The subsequent codes influenced by Pressley and Afflerbach (1995) included navigating which combined choosing not to read all of the sections and skimming; matching skills which involves Pressley and Afflerbach’s (1995) looking for specific words, concepts or ideas; and prior knowledge. Based on her pilot study and the themes that emerged through this study, the researcher created other categories that included determining importance, guessing, making inferences, off task, reading pictures, reading word for word, and researcher intervention.

For each of the participants, the researcher carefully examined the transcripts for the three Internet sessions. She distinguished the coding chunks to identify each of the decisions the participant made during the Internet reading session. The following example from Allan’s first Internet session, demonstrated the number of decisions the participants made quickly.

**Sample one of coding from session one.**

A: Ummmmmmmm. Let’s see. Ancient Art. (DI - Participant selected Ancient Art button on left side of page.)

R: And why Ancient Art?

S: To see what they, why the rulers in Ancient Egypt had statues built. (MI - Here Allan had associated “art” with statues)
The first coding sample showed Allan making a decision to select the Ancient Art button. Allan articulated why he had selected the link, using his prior knowledge to select a link he believed would take him in a direction needed to find the answer.

**Sample two of coding from session one.**

R: What made you…?

S: Because they wanted to uh, leave their mark in history. (DI - Allan selected another link after skimming (N) the section quickly.)

R: Okay. What made you leave that other, that other Ancient Art?

S: Because it didn’t have anything about statues. (MU - Independently, Allan monitored his understanding and realized he was not locating the information he had hoped.)

The second coding sample demonstrated that Allan monitored his understanding. He determined the importance of a link as he navigated the site, skimming for key information. As he skimmed, he quickly monitored his understanding and decided whether or not the link had taken him where he could find the information he needed.

Finally, the third coding sample showed Allan’s reliance on his prior knowledge.

**Sample three of coding from session one.**

R: Okay, and, and then you clicked on sculpture? Why’d you click on sculpture?

S: I thought, since ummm, statues are sculpture …. (PK - Based on prior knowledge, Allan made an informed decision to select this link that led him to the correct answer.)

Sometimes, as was demonstrated by these three coding chunks, a coding chunk included several decisions made simultaneously. Allan’s thoughts occurred quickly as he made
his way through the web site. Each coding chunk, however, demonstrated new decisions in the reading process, and they often happened rapidly and simultaneously.

Table 26

_Coding Categories Created by Researcher from Emerging Patterns in Internet Sessions_

<table>
<thead>
<tr>
<th>Code</th>
<th>Definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining Importance (DI)</td>
<td>Reader checks his/her prediction and makes decision based on that understanding.</td>
<td>I think I will find the answer here so I am going to read carefully.</td>
</tr>
<tr>
<td>Making Inferences (MI)</td>
<td>Reader reads between the lines or finds an answer to the question that is not directly evident in the text.</td>
<td>It doesn’t come out and say the answer, but I’m pretty sure it means ___.</td>
</tr>
<tr>
<td>Matching Skills (MS)</td>
<td>Reader looked for words in the text that matched keywords in the question.</td>
<td>I’m looking for a specific word. It might be in bold or underlined.</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>Reader examines the structure of the web site to determine how s/he should proceed with the reading: order of reading, whether to skip or not, reread, etc.</td>
<td>This didn’t help me, so I am going to go back up here to reread.</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>Reader uses the search box, scrolls through the pages, or selects hyperlinks to make his/her way through the web site.</td>
<td>I’m going to click on this link. I’m going to type the keyword from the question in the search box. I think this word will take me to a page that will give me the answer.</td>
</tr>
<tr>
<td>Off Task (OT)</td>
<td>Reader makes extra comments not related to the reading or comments on his/her feelings about the reading.</td>
<td>I’m tired of looking for this answer. (sighs)</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>Reader uses experiences to connect with the text as well as knowledge of text structure to organize reading</td>
<td>I remember learning about this in school.</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>Reader pays attention to every word of the text in order to gain a better understanding of the text. Often uses the cursor to move under the words.</td>
<td>Whispers under breath or reads out loud, often following with the cursor.</td>
</tr>
<tr>
<td>Researcher Intervention (RI)</td>
<td>Reader is distracted or confused and the researcher must intervene to get the reader back on track. Researcher asks questions or provides hints to help reader.</td>
<td>I do not know what to do. This doesn’t look like the other pages.</td>
</tr>
</tbody>
</table>

As demonstrated in chapter IV, the number of times a participant used a particular strategy was recorded. The researcher was then able to compare the number of times a strategy was used collectively. She was also able to explore patterns for each participant.
as well as difference between the individuals. While chapter IV provided readers with a table (Table 25) that reported the three sessions together, Tables 27, 28, and 29 separately reported each participant’s use of the strategies.

Table 27

**Number of Individual Strategies Used Per Participant in Session One**

<table>
<thead>
<tr>
<th>Strategy</th>
<th>#1 Anne</th>
<th>#2 Laurel</th>
<th>#3 Jeremy</th>
<th>#4 Konrad</th>
<th>#5 Allan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining Importance (DI)</td>
<td>8</td>
<td>3</td>
<td>5</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Making Inferences (MI)</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Matching Skills (MS)</td>
<td>6</td>
<td>9</td>
<td>5</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>14</td>
<td>5</td>
<td>9</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>12</td>
<td>9</td>
<td>12</td>
<td>18</td>
<td>8</td>
</tr>
<tr>
<td>Off Task (OT)</td>
<td>5</td>
<td>12</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>3</td>
<td>7</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Researcher Intervention (RI)</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>TOTAL CODING CHUNKS</strong></td>
<td>58</td>
<td>56</td>
<td>49</td>
<td>52</td>
<td>40</td>
</tr>
</tbody>
</table>

The breakdown of the scores for the first session were as follows: determining importance, eighteen percent; guessing, two percent; making inferences, four percent; matching skills, twelve percent; off task, which included additional comments or random
thoughts by the participants, nine percent; monitoring understanding, sixteen percent; navigating, twenty-three percent; prior knowledge, seven percent; read pictures, three percent; read word for word, seven percent; and researcher intervention five percent.

Table 28

Number of Individual Strategies Used Per Participant in Session Two

<table>
<thead>
<tr>
<th>Code</th>
<th>#1 Anne</th>
<th>#2 Laurel</th>
<th>#3 Jeremy</th>
<th>#4 Konrad</th>
<th>#5 Allan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining Importance (DI)</td>
<td>8</td>
<td>2</td>
<td>3</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>1</td>
<td>5</td>
<td>9</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Making Inferences (MI)</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Matching Skills (MS)</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>8</td>
<td>3</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>11</td>
<td>8</td>
<td>11</td>
<td>23</td>
<td>13</td>
</tr>
<tr>
<td>Off Task (OT)</td>
<td>1</td>
<td>18</td>
<td>2</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>Researcher Intervention (RI)</td>
<td>1</td>
<td>10</td>
<td>3</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>TOTAL CODING CHUNKS</td>
<td>42</td>
<td>57</td>
<td>43</td>
<td>65</td>
<td>6</td>
</tr>
</tbody>
</table>

Session two found the following categorical percentages: determining importance, nine percent; guessing, eight percent; making inferences, five percent; matching skills, ten percent; off task behavior, nine percent; monitoring understanding, twelve percent; navigating, twenty-one percent; prior knowledge, four percent; read
pictures, zero percent because there were no pictures to read; read word for word, eleven percent; and researcher intervention, seven percent.

Table 29

*Number of Individual Strategies Used Per Participant in Session Three*

<table>
<thead>
<tr>
<th>Code</th>
<th>#1 Anne</th>
<th>#2 Laurel</th>
<th>#3 Jeremy</th>
<th>#4 Konrad</th>
<th>#5 Allan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining Importance (DI)</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Guessing (G)</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Making Inferences (MI)</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Matching Skills (MS)</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Off task (M)</td>
<td>3</td>
<td>12</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Monitoring Understanding (MU)</td>
<td>11</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Navigating (N)</td>
<td>12</td>
<td>6</td>
<td>6</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>Prior Knowledge (PK)</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Read Pictures (RP)</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Read Word for Word (RWW)</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Researcher Intervention (RI)</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL CODING CHUNKS 177</td>
<td>49</td>
<td>35</td>
<td>31</td>
<td>39</td>
<td>23</td>
</tr>
</tbody>
</table>

The final session did not reflect the same break down as the previous two sessions. This session had the following percentages: determining importance, fifteen percent; guessing, eleven percent; making inferences, fifteen percent; matching skills, five percent; off task behavior, eleven percent; monitoring understanding, fourteen percent.
percent; navigating, twenty-five percent; prior knowledge, two percent; read pictures, six percent; read word for word, ten percent; and researcher intervention, two percent.

**Strategies Used by Internet Readers**

After tabulating the number of decisions made in each session, the researcher was able to determine the percentage of each session given to a particular strategy. In all three sessions, the following strategies seemed to dominate the coded strategies: determining importance (DI), monitoring understanding (MU), and navigating (N). In the first two sessions, matching skills (MS) were also important, but reading word for word (RWW) emerged in the top four strategies in the third session. For all three sessions, the researcher decided to remove Laurel’s responses from the off task coding category because her frequent and often random comments did not fully reflect a typical student’s responses; her exceptionality perhaps influenced her interactions with the researcher and gave a more skewed picture of the data for that category. The following section will discuss the data for the following categories: determining importance, matching skills, monitoring understanding, and navigating.

**Determining importance.**

Determining importance involved similar skills for reading static or traditional text and reading Internet text. When a reader reads for information, she must quickly determine whether a link will take her in the right direction. She might say to the researcher, “I’m picking this one because I think I’ll find the answer here” or “I’m going to read this part carefully because I think this will give me the answer.” A reader should be able to quickly determine whether a decision would take her towards a better understanding of the content or in this case answer the given question. A good reader
uses her schema to make these decisions, basing her direction in the reading on what she already knows about the topic as well as what she already knows about the structure of the text.

In the first two sessions, Laurel and Jeremy, who appeared to be the most distracted of the five participants and who did not do as well on their NWEA spring test as the others, used this strategy much less than the other three. Anne, who scored relatively well on her NWEA tests, used determining importance fourteen percent of the coding chunks and Konrad and Allan, who also did well on the standardized tests, used it fifteen percent of the time. Laurel, however, in the first session only had five percent of her coding chunks identified as determining importance. As she looked for answers to the questions, she did so simply by navigating and matching words in the questions to words she saw on the page. Here, reading ability appeared to have had an impact on the thought processes of the participants, and as Spiro (1998; 2004) suggested the participants who were the weakest at reading had difficulty with the structure of the Internet reading environment.

According to Afflerbach and Pressley (1995), good readers evaluate their reading decisions and make decision based on that thought processing. They determine whether what they are reading is important to their understanding. When Anne said as she clicked on the title, “I’m going to go to ‘Mummy Masks: Faces of the Dead’ because maybe it will say something about why they make statues of them, and it might give me some useful information,” she provided the researcher with a clear example of determining importance. Here she evaluated the worthiness of her choice and made a decision while simultaneously clicking on the link. This is characteristic of many readers on the
Internet, and of the five participants, those who were the strongest readers. Allan used determining importance as well. During session one, he evaluated whether or not the button he was about to select would take him in the direction he desired. When the researcher asked, “What are you thinking,” he replied, “To think if I’m going to click this button or not.” Immediately, he clicked the link and promptly began scrolling down the page looking for answer to the current question he was investigating. Successful readers determine the importance of what they are reading by measuring it against their schema, or what they already know (Anderson & Pearson, 2000).

**Matching skills.**

Matching specific words in the text to key words in the questions provided the participants with a quick way to find information as they read. This strategy was unique to reading on the Internet and was a category added by the researcher after examining the themes. As the participants read the web sites to find the information, this strategy was one of the top four in sessions one and two, but not as important in session three. Using matching skills, participants ignored most of the text as they searched for words they felt would take them in the right direction of finding an answer to the posed question. The data for this particular reading strategy, though, posed an interesting observation for the researcher. Instead of the top readers using this strategy, the two who scored lowest on the Spring NWEA test used this strategy the most. In the first session, Laurel used it sixteen percent of the time and in the second session, Jeremy used it fourteen percent of the session; Laurel, ironically only used it seven percent of the time. The researcher should point out, however, that Laurel was extremely distracted and off topic with thirty-two percent of her coding chunks being categorized as off task behavior.
When participants employed matching skills, they seemed to have only one goal in mind: find the word that matched part of the question. Cognitive flexibility theorists warned of this reading tendency, especially if the reading event is not supported or guided by the teacher (Spiro, 2004). Readers will often move too quickly looking for a specific word or topic unless they are directed to do otherwise. The researcher observed participants scrolling quickly up and down on a page with the participant just looking for highlighted or hyperlinked words. At this point, the participants were not reading the text in the traditional sense of the word. They had control of how quickly the page passed them by using the mouse to scroll the page. If they had to use a textbook to locate answers to a homework worksheet, they would only be able to control how fast their eyes could travel the page. The static text also offers limited choices in the highlighted words; a web site like the ones selected for this study, contain a plethora of choices often hyperlinking several words within one sentence.

During the first reading session one of the questions participants were asked included “In what year did the Royal tomb begin?” Participant two, Laurel, used this particular strategy the most of all five participants. She scrolled quickly through the page and said, “I’m looking for a specific year.” Another time, as she looked for information on how Stalin had changed the Soviet Society, she appeared distracted by the text she was reading, commenting “You see, most of the kids in my grade, most, all the boys in my grade, they technically, they have, they have the attention span of a cocker spaniel, so if it’s not interesting, they zone out completely.” The researcher suspected she was avoiding the question by keeping the discussion off topic; suddenly, though, she exclaimed, “Blah! Hey, look! Stalin’s changes in the Soviet Society. Stalin
replaced...,” and her words trailed off as she read the selection more carefully. While casually talking with the researcher, she had continued looking for a word or type of word, not truly reading the text, at least not for comprehension.

This action demonstrated typical behavior for several of the participants. They seemed to simply skim the text, which is another behavior that will be discussed later in this chapter. However, all of the participants to some degree reacted to the text in this manner. Jeremy, the other student who did poorly on the standardized tests, in all three sessions guessed (G) throughout the reading events. Guessing was one of the themes that emerged during data analysis, but because the other four participants did not employ this strategy, it was not qualified as one of the top four strategies used by sixth-grade readers. However, the researcher feels it provides important insight into the type of reading Jeremy did on the Internet, and it also explained why he used matching skills (MS).

During the second session, for example, Jeremy used the cursor early on to highlight words when he slowed down at a word he thought matched a word in the question, such as Joseph Stalin, and then he continued using the mouse to scroll down the page quickly. When the researcher asked him if he were reading word for word, he replied he had not been reading word for word. The researcher probed, “You were skimming it?” Jeremy nodded and said, “Yeah.” “What are you looking for,” asked the researcher to which Jeremy answered, “I’m looking for like something like Stalin and the Soviet Union.” He continued to scroll up and down the page in silence, stopping every once in awhile to put the cursor over bold words as if he wanted to select a hyperlink. Jeremy, as in the other two sessions, grew noticeably frustrated. His body language changed at this point and he said exasperatedly, “I can’t find anything!” Immediately, however, almost
simultaneously as expressing his frustration, he exclaimed, “Right here!” He had caught a glimpse of a bold word that matched part of the question for which he was looking. At this point, the researcher asked Jeremy to clarify what had just happened and what he was thinking. Jeremy replied, “Like it just doesn’t like to pop out at you right away. Like you just kind of read it and you do not know if it is like it just yet.” Anecdotally, according to the transcripts and field notes, the participant was unable to indicate what he had just read while looking for that key word. Because he was unable to recall the context of what he had just read, the researcher surmised that he had not read the text at all.

*Monitoring understanding.*

Monitoring understanding involves the reader looking carefully at the structure of the text and deciding whether she is getting the information she needs to comprehend the text. A participant might say “This didn’t help me, so I’m going to go back to the home page.” In all three sessions, the stronger readers relied heavily on this strategy, and the less skilled readers did not. Laurel, who tested quite low on the spring NWEA, failed to truly monitor her understanding. In fact, she used it in session one only nine percent of the time compared to Anne’s twenty-four percent, Konrad’s seventeen percent, and Allan’s thirteen percent. For session two, Laurel only used it five percent of the time whereas the other four participants used it eleven to nineteen percent of their strategies. In the third session, Laurel did monitor her understanding slightly more than Jeremy, but at nine percent, it was nowhere near the twenty-two percent that Anne used this particular strategy. Anne, as it turned out, was one of the stronger readers used in this study.

When Anne monitored her understanding, she did so quickly and with a natural ease. The first web site dealing with ancient Egypt was not easy for the five participants
to read, and Anne relied on her monitoring understanding skills to process the information while she read. As skimmed the web page looking for a year the building of the Royal tomb began, Anne thought out loud, “Work began on the dismantling… ewww!! They are mummifying him,” and she continued to skim. “Okay, several, no, that not it either.” Here she had skimmed, read the material in chunks, and then determined that the direction she had headed was not giving her the information she needed. Spiro (2004) has indicated that a behavior such as this illustrates cognitive flexibility. The reader must quickly confront what she already knows, and she must either incorporate the new information into her schema or reject it and move in a different direction. Later, in this same first session, Anne selected a link called “Mummy Masks” and followed it to “Faces of the Dead.” She said “I’m going to ‘Mummy Masks’ to ‘Faces of Dead’ because maybe it will say something about why they make statues of them, and it might give me some useful information” (DI). Once the link took her to a new part of the web page, she replied, “There is nothing in here that is going to help me. I’m going to go back over here and look for something different. I’m going to ‘Sculpture,’” and she clicked on a different link. She was able to quickly assess whether the information would take her to the point she needed.

Navigating.

Navigating is unique to reading on the Internet, although it does contain the strategy of skimming which some readers use as they read static text. However, for this study navigating included a variety of strategies the participant used to make his/her way through the web page. It included using the search box, scrolling through the pages, or selecting hyperlinks to locate information. To categorize coding chunks as navigating,
participants might have said, “I’m going to click on this link” or “I’m going to click on this word because it might take me to a page that has the answer to the question.” In all three Internet sessions, navigating emerged as the reading strategy most commonly used by the five participants; of the categories, only twice was it not the most used strategy. Thirteen times, however, it was the top strategy used by the participants, and the two times it was not, it was a close second to once monitoring understanding and the other time to determining importance.

Despite the reading levels of the participants, they used this strategy in similar ways and they often did so while making other decisions. For example, during the third sessions, Anne said, “Okay. I’m going back because it helped me none” and she proceeded to scroll slowly down the page looking for the key words again. Here she was navigating the web page while having to make a critical decision that the previous selection had not advanced her search for information. At another time during this particular session, Anne moved the cursor across the bolded, red headings as she skimmed, picking a few of the choices to read out loud. Sometimes Anne navigated quickly, simultaneously determining the importance of a choice or monitoring her understanding. An excellent example of this again occurred in the third session when she checked the button selections on the left side of the page and then scrolled down to look at choices and then quickly returned to the left side of the page before making a decision to click on Educator Resources.

The other skilled reader, Allan, used navigating twenty percent of the time during the first session when he explored the web site for Ancient Egypt. Not only did he click and scroll quickly throughout this session, but he also used the search box, hoping to
locate information with little effort. He declared, “Going to type in the question because
I didn’t find it” in reference to information about the Royal Tomb. Carefully he typed the
question in the search box. At this point, Allan seemed surprised when the web site took
him immediately back to the spot he had just been. He said, “It just went straight back to
where I just was,” as though that was not what he had expected. Later, the researcher
asked him if he was reading or skimming. Allan responded that he was skimming, one of
the characteristics of navigating.

All of the participants used navigating frequently. Konrad used navigating the
most of the five participants, employing it during the first session thirty-five percent, the
second session thirty-four percent, and the third session forty-one percent of the session.
While he did not necessarily monitor his understanding, Konrad moved quickly through
the web site at each session. During the second session while locating information
regarding the Soviet Union, he skimmed (N) a bit. “I skimmed them green words,” he
commented, and then he was able to match the name Joseph Stalin with the name in the
question. Even while making an inference and determining importance of a link he might
select, Konrad was navigating the web site. “Uh, yeah,” he said as he moved the cursor
under the words as he read (N), “Hmmmmmm. Probably rise to power since it probably
has something to do with changing power” (MI). At this point, he moved to the next
section (N) and moved the cursor across the words (N). “What are you doing now,” the
researcher asked. “Trying to skim a little, not reading every word,” (N) Konrad replied.
Konrad’s behavior and his apparent ability to try different tasks at the same time
corresponds with Spiro’s (2004) thoughts on the way interacting with the Internet must
require multiple levels of interaction.
The less skilled and more distracted readers also used navigating in all three sessions quite consistently. Laurel, who as mentioned was the most distracted because of her exceptionality, used navigating in a variety of ways such as scanning for numbers or years in the first session; “I scanned to find numbers” (N), she said. Shortly thereafter during the first session, Laurel scrolled across the button selections of the menu (N), and then she read a few out loud before determining the importance of a choice (DI). During the second session, Laurel scrolled and clicked on (N) the Joseph Stalin link and was able to answer the question about who the leader was. She continued to search by skimming (N). Occasionally, in all three sessions, Laurel scrolled quickly, almost too quickly to be a viable reading action. The lines flew by quickly and until she slowed the scrolling down, she was unable to make reading decisions. Consistent with her behavior, Laurel did not always answer the questions in the order they appeared. The researcher had explained in the introductory directions that participants were allowed to skip a question to move on to another one. Laurel found this helpful. As she scrolled the cursor down the page, she was able to monitor her understanding and realize that she wasn’t finding the information she needed and she announced, “Okay, I need to go back,” and she returned to the start (N). Once she was back at the beginning, she began skimming (N) again in order to locate a word that matched part of the question.

The other weaker reader also used navigating as one of his primary strategies for locating information in the assigned web pages. However, unlike his peers, Jeremy struggled with determining how to navigate the second web site. Because the format was different from the other two and not the typical web page he is used to exploring, Jeremy asked the researcher, “So where do you click?” He seemed thrown off by the web page.
Before the researcher could respond, however, he began to scroll down the page a little until he saw highlighted words in a chart (N). Before making any decisions about the direction to head, he checked out the web site, examined its format and tried to decide a plan of action. Later in the same session, Jeremy pulled the cursor under the words in the first paragraph, underlining the words with the cursor as he read. He then scrolled down quickly. The researcher asked him what he had been doing before he scrolled down the page (N), and he agreed that he was skimming the text (N).

Like Laurel, Jeremy seemed relieved when he remembered he could answer the questions out of order. He asked “So I can like skip?” When the researcher responded that he could, he smiled and said “All right.” After that, he continued to scroll across the page until he was ready to make a decision (DI). Again, like Laurel, Jeremy scrolled rapidly at times, almost to the point that the words were not readable. At one point during the second session, he scrolled quickly through the lines. The researcher stopped and asked, “You are scrolling kind of fast. What are you thinking as you are scrolling?” To this Jeremy replied, “Well, I’m scrolling, (N) stopping at the bold letters, and reading them” (MS). Apparently, at this point, he was only looking for bold type, using his schema to simply look for a word that might match. He performed a similar action in the third session while examining the web site on the climate. He scrolled down the page (N) and stopped at a link that read “How carbon gets into living things” (MS). At this point, Jeremy had to make a decision as to whether the link would take him to the answer (DI). While he did not elaborate on his thoughts at this point, Jeremy did seem interested in what he was reading as he read silently. As the theoretical framework suggested, readers of the Internet must use what they already know in a new situation. They must combine a
variety of strategies at once, evaluating what they are reading against their schema regarding the topic or the structure of the text. When the reading environment is one that constantly changes, readers must adapt in different ways than they do when reading static text.

**Summary of Data Analysis**

The data used in this study was collected over a four-week time span during three separate Internet reading sessions completed by five sixth-grade students in a rural, Midwestern town. Each Internet session was videotaped and captured with a screen capturing program, Camtasia. The videotapes were transcribed and several times the Camtasia recordings were consulted to clarify decisions made in the videotapes. Field notes were also examined for emerging themes. Furthermore, field notes were used for important commentary on participants’ body language including facial expressions. These field notes were crucial to “seeing” behavior such as frustration not caught on videotapes. Analysis of this data allowed the researcher to explore the reading strategies used by the sixth-graders who varied in their reading levels. While each participant represented a unique individual, together the data provides a snapshot of what a sixth-grader might do when asked to look for information on the Internet, as often happened when teachers send home worksheets or research projects. Using grounded theory, the following themes emerged: determining importance (DI), matching skills (MS), monitoring understanding (MU), and navigating (N). The strategies were considered separate decision points in the Internet sessions, but further data analysis underscored the interdependence of the strategies.
Chapter VI: Discussion

This chapter discusses the results of the research’s study focused on the Internet reading strategies used by sixth-grade readers. The primary purpose of this research project included adding to the literature on reading on the Internet, an environment used by a large percentage of American students with all levels of reading abilities. Following an overview of the study, the discussion then turns to the findings of the data analysis for the five participants. Against the backdrop of the theoretical framework of the schema theory and cognitive flexibility, this chapter provides conclusions and implications for classroom teachers and teaching programs involved in the preparation of those classroom teachers. Finally, this chapter provides suggestions for future research in the area of reading on the Internet.

Summary of the Study

With the increased presence of the Internet in students’ lives, even young children come to school having had extensive interactions with the Internet. In fact, eighty-five to ninety percent of adolescents turn to the Internet for homework help (U.S. Census, 2005), and as a result, the twenty-first century classroom teacher must be ready to teach readers how to interact with this new medium. Teachers must understand that the children, these digital natives sitting in their classrooms in 2011, think differently than those who came of age in a fully print environment (Bearne, 2003; Prensky, 2001; Nielsan, 2009). They deserve a difference in the way they are taught. While the field of reading research has rapidly expanded over the past three decades, research in reading on the Internet lags far behind other areas of the field. And the information researchers have suggested has been slow to be incorporated into practice. Frequently, teachers believe that when people read
information on the Internet, they use the same reading strategies they use when reading a static or traditional written piece of information. This study, then, explored the actual reading strategies that students use when engaging in Internet reading and research.

To explore the reading strategies used by sixth-grade readers on the Internet, five sixth-grade students were asked to complete three separate reading sessions each of which focused on web sites related to social studies academic standards. During these sessions the participants were asked to stay within the parameters of a predetermined web site as they looked for answers to questions posed by the researcher. Because she wanted to simulate the limited range of information provided within a chapter of a textbook, the researcher chose to have the participants stay within the pages of the predetermined web sites. Other researchers, such as Coiro and Dobler (2007) have created studies without these limitations, so this researcher wanted to explore a different setting. To explore the reading strategies that emerged through the case studies, the researcher hoped to provide another snapshot of how the typical students in the upper elementary might read Internet resources allowing classroom teachers to focus on the development of those strategies.

Because this study focused on case studies, the researcher cannot apply generalizations to other sixth-graders, and she would encourage readers of this study to not assume they can apply the generalizations to all students as well. However, the researcher hoped that the discoveries made in this study would add to the discussion currently taking place in the field of education and specifically in the field of reading instruction.

Before the study began, the researcher asked potential participants to complete a release form as well as a brief survey which asked the sixth-graders to self-disclose information regarding their use of the Internet as well as their confidence levels of
reading both traditional or static text and their confidence levels of reading Internet texts. Through this self-evaluation, the researcher gained insight into the individual participants, and it served as one data point. With permission from the parents/guardians, the classroom teacher, who happened to be the same reading teacher for all five participants, provided the researcher with other valuable information such as standardized test scores, grades for the last trimester in reading, as well as anecdotal information regarding the participants as readers and as students. All of this information provided the researcher with the background needed to create the case study narratives found in Chapter IV.

Each of the sessions required the participants to think aloud in order to reveal the thought processes they went through to read the Internet sources. Frequently the researcher had to remind the participant to articulate what s/he was thinking, and occasionally the researcher had to ask clarifying questions in order to understand what the participant had just said about his/her thinking. These points of clarification provided more depth to the think-aloud sessions. Once the Internet reading sessions had been concluded, the videotapes and field notes were transcribed. Several times the researcher had to refer to the Camtasia screen captures in order to have a clearer image of what the participant had done on the computer. Through careful examination of the transcripts and field notes and the types of decisions made throughout the reading event, the following themes emerged: determining importance, guessing, making inferences, matching skills, off task, monitoring understanding, navigating, prior knowledge, read pictures, read word for word, and researcher intervention. Once the number of total decisions made for each participant was determined, a percentage of use for each strategy was calculated. Of the
eleven themes, determining importance, matching skills, monitoring understanding, and navigating emerged as dominate themes. At the end of each session, the participants often entered casual conversation with the researcher during which time they discussed their feelings and observations about reading on the Internet versus reading the traditional static text as is often done in schools with textbook reading. The video recorder was left on until the participant had fully finished the Internet sessions and this discussion was included in the transcribed sessions. Details regarding these four themes that unfolded from the transcribed think-aloud sessions and field notes as well as the informal discussions that occurred following the formal think-aloud sessions were also reported in Chapter IV and Chapter V.

Findings

The data collected for this study focused on one central research question for which the results will be discussed. Through the examination of the transcripts, the field notes, and information provided by the participants in their surveys as well as comments they made at the end of the sessions, the researcher observed other results occurring as well, results not part of the focused research question. Those will be discussed following the discussion of the research question which was what reading strategies do sixth-grade students of varying reading abilities use when answering questions by reading a source on the Internet?

Like other research (Coiro, 2005; Coiro and Dobler, 2007), upper elementary school readers of the Internet used strategies similar to those they use when they read static text. Not only did they have to determine the importance of what they are reading and whether the information was adding to what they already know about the topic, but
they also had to monitor their understanding. In both reading environments, readers must have assessed whether or not they comprehended the text. If they did not understand the text, they made a decision to take a new direction in their reading. In this study, the researcher identified the individual coding chunks as each decision made by the participant during the reading session. For the individual sessions, then, the researcher was able to find a total number of decisions made for the individual five participants as well as their combined results. With this information, the individual strategies that had been tabulated for each participant then were assigned a percent of the total strategies used. For example, in the first session a combined total of the five participants involved 255 coding chunks. Of the 255 coding chunks, thirty were identified as determining importance or eighteen percent of the coding chunks. Other strategies, like reading pictures only occurred eight times or three percent of the coding chunks for the first session. From the coding chunks, the researcher observed that sixth-grade readers, despite their reading ability, use a variety of reading strategies when they read Internet web sites. The four that emerged as most prevalent were determining importance, matching skills, monitoring understanding, and navigating.

**Determining Importance**

When reading Internet sources, readers must evaluate the importance of a link and make a decision rather quickly as to whether that decision will take him/her to a part of the web site that will influence his/her understanding or locate the correct information. In session one, Ann, Konrad, and Allan relied heavily on this strategy. Anne used it fourteen percent of the coding chunks and Konrad and Allan used it fifteen percent of the time. While Jeremy did not use it as often, he did use it for ten percent of his decisions.
Laurel, on the other hand, relied little on determining importance, using it only five percent of the time during her first session. Session two found Anne using this strategy the most with nineteen percent of the forty two decisions she made. Konrad used it twelve percent of the time. Again, Laurel only used it four percent of her fifty-seven coding chunks. In the final session, all five of the participants relied on determining importance. Anne relied on it twenty percent of the time; Laurel also had twenty percent of her decisions in this category. Jeremy also relied on this strategy more than Konrad and Allan, with sixteen percent of his decisions coming from this category. Konrad had ten percent in the determining importance and Allan used it thirteen percent of the time.

Observations revealed for the first two sessions that because Laurel and Jeremy relied less on this strategy, their reading on the Internet often appeared unorganized and rather haphazard. As the theoretical framework suggested, the two readers who did not have the schema developed for maneuvering through the web page, struggled with understanding how to find the answers to the questions. Both Spiro (2004) and Anderson and Pearson (2000) indicated important correlations to the participants’ behaviors. As indicated by the schema and cognitive flexibility theories used as a framework for this study, participants who were less skilled in their reading seemed to “flounder” in the reading environment of the Internet. Both Laurel and Jeremy relied less on reading in the traditional sense of the word and more on simply finding the word they needed. They lacked the schema and the ability to manipulate what they already knew in a new setting. When the researcher imposed the limitation of staying only in the prescribed web sites, they struggled to adjust their typical Internet reading behaviors which relied heavily on scanning quickly and abandoning the web site if they did not find what they needed.
Instead of quickly examining the choices, evaluating and predicting which one might further the understanding of the reading, and following the decision, these two readers often made choices based on convenience or availability of the link. In fact, they sometimes appeared to randomly make a decision because they knew they had to find an answer. Instead of basing their decision on information or prior knowledge, they simply selected the link or navigated to a different area hoping they would find something that made sense to them. The schema theory as well as the theory of cognitive flexibility indicated that readers must quickly evaluate the new material they are reading in relationship to what they already know about the context and content of the reading event. This cognitive ability allows them to make reading decisions quickly. For the skilled readers, determining importance allowed them to find answers and to spend more time monitoring their understanding; however, this ability to determine importance rapidly finds its roots in the ability to connect with prior knowledge as suggested by the schema theory and to quickly manipulate one’s attention based on how the new information fits in with what was previously understood as suggested by the cognitive flexibility theory. Through the analysis of the data, both the session transcripts and the field notes, the participants demonstrated the importance of relying on prior knowledge or schema to read the web site easily. The skilled readers made decisions quickly and with little difficulty. For example, Allan and Konrad frequently used the search box, a strategy they knew had worked before. These three “navigators” also knew enough about the topic from their social studies curriculum that they evaluated the navigation choices they had and made quick decisions about the direction of their reading. As Pressley and
Afflerbach (1995) indicated, good readers practice strategies such as monitoring their understanding and making reading decision seamlessly as they read.

**Matching Skills**

Pressley and Afflerbach (1995) also suggested that skilled readers of static text look for specific words, concepts or ideas. A similar behavior was observed in this study as participants looked specifically for bold or colored words that matched words in the questions. In the first session, the participants collectively used it twelve percent of the 255 coding chunks. They used it ten percent of the 268 reading decisions made in the second session, but only five percent of the 177 decisions in the third session. They relied much more on this strategy for the first session than they did the last session.

Participants frequently relied on matching skills to find information quickly. During session one, Laurel said, “Well, that matches and if I click on that I will probably find it. If this is very specific then it is probably good.” The researcher asked why it would be good and she replied, “Well, I get mad whenever I can’t find the link I want so if they want something specific then they want very specific. Look right there. Simply there.” When she said, “Simply there,” she was referring to the answer she had located by matching the name Akhenaten to a button on the left hand side of the page. That hyperlink had taken her to another page that provided her with the answer to who was Akhenaten. Matching skills for the five participants often drove the direction of their search.

**Monitoring Understanding**

Monitoring understanding is the reader’s checking of his understanding. As s/he looked for answers to the questions, s/he had to evaluate whether the information s/he
was reading made sense or that it added to his/her understanding of the content. In the first session, monitoring understanding was sixteen percent of the decisions made. The participants used monitoring understanding twelve percent of the second session, and fourteen percent during the third session. They would make a decision to read a section of the web site or to follow a link to another part of the web site. Comments like “I think I found it, but I’m not sure. Okay, the vast majority of, uh, that’s not it, that’s when it was… dang,” demonstrated that the participant was deciding whether the information s/he was reading gave him/her the answer s/he needed to adequately answer the question.

Cognitive flexibility has indicated that successful readers of the Internet are capable of using a variety of strategies interchangeably as they make their way through the ever changing landscape of Internet text (Spiro 1991, 2004). Because these successful readers are confident in their reading abilities, they possess an agility that enables them to maneuver through the Internet’s hypertext, monitoring their own understanding of the content. Successful readers in this study did just that; they applied a variety of strategies seamlessly in most cases to move through the website, making decisions simultaneously with monitoring their understanding.

**Navigating**

Navigating was by far the most used strategy of the identified categories. In this category, participants not only skimmmed the web site, but they also chose not to read specific parts of the web page as Pressley and Afflerbach (1995) indicated. Participants’ actions that demonstrated this category included scrolling rapidly up and down the page or skimming; they did not read every word. Every time the transcript read “scrolled” or the participant commented that s/he was “skimming,” then the researcher coded the
decision as navigating. Two of the participants used the search box into which they typed a key word or the entire question.

Navigating was an important strategy used by the participants because it allowed them to move through a great amount of content in a short time. The participants used navigating twenty-three percent of the 255 coding chunks in the first session, twenty-one percent of the 268 chunks in the second session, and twenty-five percent of the 177 coding chunks in the third session. Interestingly, as Spiro (2004) asserted, ill-structured texts provide readers with a setting that requires them to think on deeper levels; as participants in this study navigated their way through the web sites, the “navigators” clearly possessed the skills needed to navigate through the Internet sites. The three participants identified as “navigators” were required to process information and created a deeper level of understanding. This navigating characteristic supported Spiro’s (2004) claim that activities involving technology such as looking for information on the Internet would lead learners to create new ways to learn and retain information in a way that is unique to the situation. As the “navigators” made their way through the web sites, this could be seen as the participants read with purpose, focused solely on finding the information required by the designed questions.

**Off Task Category**

Another category that needed explanation was the off task category. This category allowed the researcher to explore the comments that participants, such as Laurel, made that did not fit neatly into the other categories. This off task category contained any coding chunk in which the reader made extra comments that were not related to the reading or that were editorial comments about how s/he was feeling. Because the study
relied on a think-aloud method for collecting data, participants were asked to tell what was going through their minds. Participants like Laurel used it twenty-one percent of the time in the first session, thirty-two percent in the second session, and thirty-four percent of the third session. Because of her identified exceptionality, Laurel was often distracted and off task. She offered frequent comments that had little to do with the web site she was reading.

**Less Prevalent Strategies**

Finally, guessing, making inferences, prior knowledge, reading pictures, reading word for word, and researcher intervention were among the remaining strategies identified in this study. While they were not prevalent, they were part of the reading processes. Guessing included simply choosing something because there seemed to be no other option to the participant or the participant suggested answers to questions based on nothing in the text they were reading. Jeremy was the one participant who relied on guessing. As one of the weaker readers in the study, he used it six percent of the time in the first session, twenty-one percent of the time in the second session, and sixteen-percent of the time in the third session. The other participants came nowhere close to the number of times that Jeremy guessed at an answer or guessed when making a decision as he read. The more frustrated Jeremy became, the more he guessed, particularly in the second session. As previously mentioned, he grew visibly disturbed using the web site which focused on the Soviet Union primarily because it lacked pictures and had a structure unfamiliar to him.

Making inferences and using prior knowledge were two strategies that appeared slightly in the research, but they did not as frequently as the others. For the first two
sessions, making inferences occurred only four percent and five percent respectively.

During the third session, the participants used it more than in the previous two sessions or eight percent of the time. In the third session, for example, Konrad offered an answer and said, “I think he helped them by… I think he helped them from.. like.. he was strong. He was responsible for up to five million deaths.” The readers, as with static text, had to infer the information; they were unable to simply match the words in the question to the words in the text. Using prior knowledge was another traditional reading strategy, but it was not employed frequently during this research. It was used seven percent of the 255 coding chunks in the first session and only four percent in the second session and even less in the third session (two percent).

**Conclusions**

Reading on the Internet poses an interesting situation for readers, especially sixth-grade readers of varying reading abilities. Through an examination of the data from this study, the researcher was able to make several conclusions: readers of the Internet do rely on traditional reading strategies; reading on the Internet is similar to reading a static text, but the act involves differences as well; the Internet requires a different type of attention than the traditional text; and less skilled or less proficient readers may have a more difficult time reading information on the Internet to answer questions. These conclusions allowed the researcher to make suggestions for classroom teachers, giving them a better picture of what types of strategies they should teach their students to read on the Internet. In the end, the researcher hopes that these conclusions will provide her with a better understanding of what happens for different readers so that she can
incorporate these ideas into the curriculum she uses to prepare future teachers in the teacher education program in which she teaches.

**Traditional reading strategies apply to reading on the Internet**

Too often, as Knobel and Lanksheer (2002) indicated, educators believe that reading on the Internet simply involves applying traditional reading strategies. Others who have conducted research in the field of reading Internet sources (Coiro & Dobler, 2006; Coir, 2007) have urged practitioners to believe there are additional strategies used; these researchers believe one cannot assume traditional reading strategies apply fully to the environment of reading on the Internet. However, the data from this study suggested that some traditional reading strategies were applied to reading Internet sources in the three Internet sessions. These traditional strategies included determining importance and monitoring understanding. Collectively, the participants in this study used determining importance eighteen percent of the 255 coding chunks in the first session, nine percent of the 268 coding chunks in the second session, and fifteen percent of the 177 coding chunks in the third session. Determining importance involved making a prediction based on prior knowledge about where that decision might lead. It also required the participants to evaluate the importance of that decision. These two decisions happened almost simultaneously. The better readers were able to make these decisions quickly whereas the poorer readers often floundered trying to make their way through the web sites.

As the better readers made decisions quickly and the poor readers did not, the researcher could see the parallel to the scheme theory that created the theoretical framework for this project. When readers approached the reading event, they approached
it with previous experience and knowledge of the topic. This cognitive ability to connect the current text with which they were interacting to previous experiences or knowledge was important because it allowed the reader to connect new information to content with which they were already familiar (Anderson & Pearson, 2000). As these readers interacted with new Internet sites selected by the researcher, they had to rely on their prior knowledge of how web sites were constructed as well as their prior knowledge of the content of the page: Ancient Egypt, the Soviet Union, and climate. In this project, the “flounders” ended up not being able to tap into their prior knowledge or when they did, what they thought might help them understand the material they were reading did not help at all. As a result, spent a lot of time simply wandering through the web pages, hoping an answer would jump out at them.

Readers of the Internet also monitored their understanding in much the same way they do when reading a static or traditional text. They asked themselves questions regarding whether or not the material they were reading added to their understanding. If it was not, then they made a decision to reread; this is true for static text as well as Internet text. The participants in this study used monitoring understanding sixteen percent of the coding chunks for the first section or 42 of the 255 coding chunks, twelve percent or thirty-two times of the second session, and twenty-four times or fourteen percent of the third session. According to Spiro, Bruce, and Brewer (1980), readers must be able to apply a variety of strategies when they read. Readers must also be flexible with their prior knowledge and monitor their understanding. This ability applied to the participants as well. As the participants navigated through the material in the various websites, they frequently attended to a variety of decisions at once. For example, during the second
session, Konrad completed a variety of decisions when he said, “Yeah. Ethnic group,” and he scrolled around the web page (N). “I thought I saw something else,” he continued and went back to the search box where he typed “Soviet Union’s ethnic groups” (N). He scrolled through the choices, reading a bit under his breath. “I see ethnic, so probably I would try that” (DI). He clicked on the link and it took him to “Collapse of the Soviet Union” (N). With that decision, he replied “Then I would look at them green words for ethnic” (MS). Within a short amount of time, Konrad made a variety of decisions that took him closer to the discovering the answer to his question.

**Reading on the Internet is different than reading traditional or static texts**

In response to the number of kids using the Internet as well as in response to the increased availability of the Internet in schools, teachers incorporate this technological tool into their school work. Teachers may assign homework that asks students to answer questions using the Internet or they may even take children to the computer lab to find information on various topics, researching countries or people, for example. Frequently, these classroom teachers assume their students possess the skills needed to read the Internet sources, and they provide little instruction in how to read the web site or they spend little time structuring the assignment to be beneficial to the ones completing it. Even though the data from this study indicated that some of the strategies used for static text can be applied to reading Internet text, information from the participants as well as the reading of the transcripts indicated that additional strategies were frequently used when the participant read on the Internet. In other research, the biggest difference between the two types of reading was the power the reader possesses in the direction of the reading (Salmeron et al., 2006); the nature of hypertext created a new reading event
each time. This was evident as the participants navigated their way through the web sites. The ability to navigate and process information was a strategy that enabled the readers to gain information quickly.

Navigating, however, even when completed by the better readers, did not always lead to a better understanding of the text. For example, during the first session, Allan used the navigating strategy as he skimmed the text looking for the Royal Tomb. Also using the monitoring understanding strategy, Allan knew that he was not finding the answer he needed. The researcher intervened and reminded him he could skip a question if it would help him. He said he would probably skip the question, “’cause I do not see.” In this situation, he had navigated the web page and had made several choices by determining the importance of the link and monitored his understanding, but the links had not taken him to the answer he had hoped to find.

**Reading the Internet requires a different attention than reading static texts**

Throughout the exploration of the transcripts, the researcher observed the need for participants to redirect their attention while reading the Internet. Several times in the duration of the study each of the participants was distracted by something in a web site. The best example of this distraction involved the video in the third web site. All five of the participants selected the link to the video, and they did not know it would take them to an animated video. A few were able to abandon the link when they realized it would not provide them with the information they needed. However, the weaker readers, Laurel and Jeremy, were fully distracted by the video, and did not successfully redirect themselves until the end of the video. As Coiro (2003) pointed out, hyperlinked text can confuse readers, and this illustration demonstrated that confusion or at least their
distraction. Cognitive theorists argue that people can only attend to a few things at a time, and as they read, they must build connections or structured mental pictures (Charney, 1994). When students read online and follow these hypertexts, they become distracted. This was suggested in this current study as the participants, especially the weaker readers, found themselves confused by text and the environment of the web page, corroborating Spiro’s (2004) discussion of the importance of creating structured assignments for students using the Internet.

Coiro (2003) also suggested that when students read on the Internet they act as a coauthor of the text, deciding which direction to go within the site. For each of the sessions, the individual participants conducted their reading of the Internet source using different paths. Each participant made his/her own decisions and no two participants followed or read the web sites in exactly the same manner. Simply by looking at the first session, the researcher was able to see this type of difference. When exploring the web site to answer why rulers of Ancient Egypt had statues of themselves built, Anne scrolled up and down the side column, and said, “I’m looking to see if there are like, statues or something. I think I am going to go to Ancient Art.” The researcher asked her to clarify why she selected Ancient Art, and she replied, “Because like statues, art, artists make statues.” Once she had clicked on the link and scrolled up and down the page, she announced, “I’m going to go to ‘Mummy Masks, to faces of the Dead” because maybe it will say something about why they make statues of them, and it might give me some useful information.” As she completed her first session, when Laurel came to the same question about why rulers had statues of themselves made, she took a slightly different route than Anne. Instead, Laurel clicked on the tab entitled “Sculpture,” and she
announced “Hey, look Sculpture!” She continued by saying “Statues and sculpture are not that different! To leave their mark in history—it’s right there!” Jeremy made a similar decision as Laurel, clicking on sculpture. Instead of reading the words, however, he simply looked at the pictures, and then he said, “Because… uhm… ugh… it’s hard to explain. Mmmmmmm—I’m guessing.” Unlike the previous two participants, Jeremy began to exhibit great frustration. Even though he had followed the same reading path as Laurel, he was unable to attend to the question without being distracted.

Interestingly, Konrad and Allan both selected Ancient Art to explore this question. Both found their answers relatively easy.

While the participants did use strategies they might use while reading static text, they had to do so with great speed, much more so than they do while making their way through static text. Decisions were made instantly while scrolling or navigating through text; the multiple layers of the web site meant that each decision could lead the readers in a different direction, and they did not have the luxury of flipping through pages. This observation underscored Rand Spiro’s theory of cognitive flexibility. In this criss-crossed landscape (Spiro, 1991), the reader must quickly re-edit the material to understand it. Because the web site contains hypertext, it is always changing and it thus creates an ill-structured domain (Spiro, 1991). When the participant was given questions to answer using the assigned web site, s/he was forced into an ill-structure domain. Little guidance was given, and s/he had to quickly adjust to the reading environment. As previously discussed, some did so with more ease than others. When Jeremy tried to locate information regarding the Soviet Union in the web site that had no pictures and did
not follow a traditional format, he struggled. He needed more structure to the assignment.

**Weaker readers had more difficulty reading on the Internet**

While this research project did not distinguish nor focus on the reading abilities of the participants until after the data had been collected, attention was given to selecting participants with varying reading abilities for the sample of convenience. Their classroom teacher provided specific insight as did their NWEA scores. Two of the readers were clearly better readers than the two who scored lowest on the NWEA tests. Through comparison of the transcripts, the researcher noticed the physical frustration and difficulty the weaker readers had while reading the web sites. According to Cakir (2008), poor or less skilled readers tend to rely “heavily on the textual information itself.” These weaker readers also have difficulty adapting new information if it does not match the schema they previously held (Cakir, 2008).

When placing the review of the transcripts for both Laurel and Jeremy against this foundation, one can easily see the similarities. Jeremy and Laurel were not remarkably less skilled than their peers, but the NWEA test results from both the winter and the spring indicated there might be somewhat of a correlation. Jeremy grew easily frustrated several times throughout the three sessions while Laurel simply pulled the conversation off task throughout the sessions. Even though Jeremy self-reported that he was confident in his ability to read the Internet, he often seemed confused or at a loss of direction when he was reading the three different web sites. At times during the first session, he grew quiet and clicked on different links, hoping to find a word that matched a word in the question. Towards the end of the session, he appeared to click on a link out of
desperation. When he was searching for the year the Royal Tomb was built, a question that gave even the more skilled readers some trouble, he said, “I’m going to click on mythology.” The researcher asked him why he selected mythology, and he responded, “mmmmmm…. I have no clue. I just want to see what’s there. Probably nothing.” Without the schema he needed to which he could attach the new information he was finding or even to head him in the right direction, Jeremy struggled with using this web site to locate answers. The researcher made a similar observation while Jeremy completed the third session. In fact, her field notes recorded “this subject really struggled with this web site from the beginning of the session. He seemed confused by its format, and struggled greatly with vocabulary and historical content, even though this topic was recently covered in his social studies.”

As Goetz and Armbruster (1980) suggested, Jeremy lacked an interconnected memory and reading the content of this web site was difficult. The theory of cognitive flexibility explains that a reader must pull from different levels of understanding when she takes part in the dynamic environment of reading (Spiro, Bruce, & Brewer, 1980). A reader must use her prior knowledge to create hypothesis about what she is reading and then check that hypothesis as she reads. For Jeremy, however, the prior knowledge was missing in all three sessions. Because he did not have the background knowledge, he struggled greatly to even understand the questions and the content he was asked to read.

Laurel, while she seemed more confident than Jeremy, also relied heavily on strategies that were not as conducive to understanding the material. She did not enter a more advanced knowledge acquisition stage as Spiro et al. (1988) suggested. Spiro and his colleagues (1988) said that learners considered the concepts together in order to see
the integrated relationships of ideas. Less successful readers like Laurel failed to consider the bigger picture of the reading event. Several times throughout her sessions, Laurel made a variety of random statements. As articulated earlier, her number of coding chunks placed in the off task category was much larger than her peers’ use of this category. Perhaps because of her identified exceptionality, she was unable to attend to the reading process as she should have. For example, while looking for information about King Tutankhamun she was distracted, exclaiming, “even then there were bees – ooooooooooh- lalalalala!” Shortly later she was distracted again, not connecting with the material she was reading. She randomly stated, “Did you know they used to make little clay figures and they expected the gods up in the sky would put little spells on them? They had whole armies of that!” While this last statement demonstrated prior knowledge of the topic she was examining, neither the comment nor the prior knowledge advanced her understanding of the content she had been asked to read.

**Implications**

When thinking of implications resulting from this study, one cannot help but quickly think of the many stakeholders directly related to this area of the research. Of course, the primary stakeholders involve the students who interact multiple times each day with the Internet. Other stakeholders involve classroom teachers and administrators who support those teachers. Finally, the implications from this study might apply to a much larger cross-section of society, at least the cross-section that finds itself spending time on the Internet, reading texts for information in a different medium than which they were taught to read. As the researcher considers other research projects, she will keep in mind these implications in order to further adding to the work.
Computer Time Does Not Equate to the Ability to Read the Internet

One implication that emerged from the study involved assumptions parents and educators make about students, their use of the Internet, and its influence on their ability to read. Simply because children and adolescents spend time on the Internet does not mean they are actually reading the text in front of them, practicing good reading strategies if they are reading the words, or that they even comprehend the text that appears on the screen. As the participants in this study indicated on their questionnaires, they spent a lot of time “surfing” or navigating the Internet in their free time, watching Youtube videos, or playing on Facebook. They also admitted to turning to the Internet when they wanted to find information, using Google or another search engine to locate resources. However, even though these five participants use the Internet frequently and were comfortable overall with using the Internet, educators cannot assume that their Internet usage or behavior equates being able to read and understand Internet text.

Watching videos and posting comments on a friend’s Facebook wall is certainly not the same as reading an article for information. These participants, especially Jeremy, self-reported high comfort levels with using the Internet; they believed they had schemata for how the Internet works and how to navigate web pages. As a “flounderer,” though, Jeremy struggled to understand the material he was asked to read. This inability to apply what he knew about reading as well as his previous experience with using the Internet underscored the point that digital natives are not inherently adept at reading Internet sources. Parents and others involved in these children’s lives cannot safely assume that playing or surfing the Internet does not equate with reading ability. They may be tech savvy and able to navigate through familiar web pages or interact in familiar settings such
as an instant messaging chat room or on Facebook, but these digital natives still require additional support when being held accountable for their understanding of Internet sources.

**Classroom Teachers Must Organize Internet Activities**

With that said, a related implication of this project is the role the classroom teacher plays in the reading event when asking students to interact with the Internet. As Spiro and Jeng (1990) urged, teachers need to provide guided practice for students as they read Internet web sites in order to avoid over simplification. In other words, teachers cannot simply turn students loose on an Internet page or worse in a search engine without providing them with specific and structured guidance. Even if the students have had extensive experience with the Internet, they still need structure for the activity they are to complete. All five of the participants in this study either relied heavily on matching words in the Internet text with key words in the questions or resorted to that technique or strategy occasionally throughout the sessions. This implied that perhaps readers of the Internet do not read as carefully as they should; instead, they may just skim the text looking for key words. Teachers will need to not only teach students how to read the Internet effectively, but they will also need to create structured learning activities that require higher level thinking skills. Simply searching for a word that matches the question does not indicate the student has comprehended or even read the Internet text.

**Warning for Shifting to Only Online Assessments**

A much broader implication of this study involved the shift of states and standardized testing companies to begin testing children solely in electronic venues. The
state of Indiana, for example, will be moving its ISTEP test to an online version only. Instead of the traditional paper and pencil test children have historically completed, Indiana will now place children in front of the computer screen and ask them to complete the test online (Indiana DOE). The 2011 testing cycle began this transition to testing online. Eventually, the state of Indiana will require all schools to administer all grade levels of the ISTEP in an online format. While this study did not explore strategies sixth-graders used while reading traditional texts in an online environment, the behaviors of some of the participants did raise concern that students may not take the same stance towards reading electronic material as they do when they read static texts. Schools systems as well as researchers may want to take this element of reading into mind as they continue to explore reading on the Internet or in other electronic environments.

**Teacher Education Programs Must Respond to Internet Reading Strategies**

Finally, teacher education programs responsible for preparing future teachers must understand the implication this study has for their programs as well. As they prepare both early and middle childhood teachers and secondary teachers, teacher education programs will need to incorporate these findings as well as those discussed in work by Coiro and Dobler (2007) as well as Leu (2007) into their own curriculum. Teacher candidates will need guidance in how to design meaningful Internet assignments in order to elicit student learning, and they must also prepare teacher candidates to teach children and adolescents Internet reading strategies such as navigating. They will need to understand how to teach determining importance or monitoring understanding within the Internet environment, an environment which readers navigate quickly, requiring immediate decisions as they scroll up and down a page. As researchers continue to
investigate the strategies students use when reading on the Internet, they will need to consider creating guidelines. Until teachers learn how to incorporate instruction on reading the Internet or learn to create assignments that take into consideration cognitive flexibility, then students will not be taught important strategies they will use for the rest of their lives.

**Recommendations for Future Research**

This study’s focus dealt simply with identifying the strategies that sixth-grade participants used to read predetermined Internet sites to locate information to questions designed by the researcher. While this study did provide an isolated snapshot of five different sixth-grade readers, the researcher has a variety of ideas for future research.

**Evaluate Level of Comprehension**

This project did have participants offer answers to researcher-designed questions, but the project did not evaluate the type of response or the degree of comprehension the participants offered. Future research could examine the types of responses the participants offer in order to determine whether the participants truly understand what they are reading. Upon examination of the data for this particular study, the researcher observed that many of the responses were gleaned from the content of the text by matching key words, thus the reason matching skills was one of the strategies highlighted. To explore comprehension of Internet content, researchers could provide a comprehension post-test once the Internet reading session finished. Furthermore, upon exploration of the transcripts, the researcher could categorize the types of responses the participants provided to explore possible patterns in the responses. Because comprehension is the ultimate goal of reading instruction, assessing the participants’
comprehension while reading on the Internet would provide valuable information for classroom teachers.

**Increase Size of the Study**

Using a sample of convenience, the researcher selected to focus on five participants instead of designing a study that examined a wide range of students. Generalization to larger population, then, cannot be made. Future research should expand the number of participants, and perhaps reduce the number of Internet sessions in order to manage the size of the data. Those interested in comparing grade levels might consider selecting a sample of similar readers in third grade, sixth grade, and ninth grade to provide a different, more complex picture of what readers do when they read Internet text. The design of the research, however, would need to involve Internet reading sessions much more manageable for the researcher. Unfortunately, the current design would require unrealistic hours spent administering the assessments and analyzing the data if the participant pool were expanded too much.

**Compare High and Low Readers**

The study under consideration did not delineate between high and low readers. However, participants in this particular study demonstrated differences between more skilled and less skilled readers, but they were not identified by reading abilities. As previously mentioned, the researcher had made a conscious decision to not use this identifying factor until after the data had been collected. Future research should consider comparing participants with extremely high reading abilities and those with extremely low reading abilities. Participants could be selected from two distinctly different groups of students: those identified as high ability and those identified with exceptionalities. A
study with this design could provide classroom teachers with an interesting perspective of the differences between these two groups, groups they typically have in the general education classroom. While the research might pose some interesting problems the researcher would have to work out prior to beginning the investigation, the results could be extremely powerful for classroom teachers.

**Compare Texts**

Future research should consider comparing the actual comprehension of the Internet, as suggested above, to comprehension of a static text with similar content. Participants could be asked to complete reading sessions with both types of text and could be given short comprehension tests over both sources. For example, participants might be asked to read a printed article, and then asked to read a similar online article. Following the exercise of reading both texts, the participants could respond to comprehension questions specific for each example. The participants’ abilities to answer the questions might indicate which text they comprehended better. This comparison might provide information classroom teachers could use when organizing their assignments.

**Summary**

Through the analysis of the transcripts for the Internet sessions as well as the researcher’s field notes and the participants’ self-reported questionnaires, important findings emerged that have important implications for stakeholders. As the sixth-grade participants completed their Internet reading sessions, they relied on four reading strategies: determining importance, matching skills, monitoring understanding, and navigating. Just as in reading static text, Internet readers must determine the importance
of what they are reading. However, when the participants read on the Internet, they had to quickly determine the importance of what they were reading in order to decide which direction within the web site they should take. In static text reading, readers may skim or read different sections of the text, but they do not control the reading event to the extent that Internet readers do. The participants also relied heavily on matching skills, looking quickly for a key word that matched a word in the posed question. Participants relied on this strategy to quickly make their way through the page, and the “flounderer” seemed to struggle with this when they could not find a matching word. Often they would scroll quickly down and then back up again, skipping important text. Internet readers also monitored their understanding. They did this just as quickly as they used the determining importance strategy, and often these two strategies were used simultaneously. When the participants monitored their understanding they had to determine whether what they were reading added to their understanding of the content or whether they needed to go a different direction. Successful readers capably made their way through the changing landscape of the Internet (Spiro, 2004). Finally, participants used the navigating strategy the most of all strategies used. Even though the participants had never visited the selected web sites prior to their Internet sessions with the researcher, the successful readers easily navigated through the web sites. Demonstrating the importance of cognitive flexibility, they were able to take what they already knew about the topic and the specific type of web site and apply that knowledge to a brand new reading event which in this case happened to be a new web site.

Each of these findings can stand alone, but when considered together they best represent the reading event encountered on the Internet. These findings have great
implications for stakeholders. Not only should teachers and parents avoid assuming that children and adolescents who frequently use the Internet have excellent Internet reading skills, but they should also provide explicit and structured instruction in how to read Internet sources. Teacher should also provide structured Internet sessions that allow the teacher to monitor as well as model how the students are interacting with the web sites. Simply turning students loose on the Internet with little support does not provide students with the structure they need (Spiro, 2004). Ultimately, teachers must recognize that while students use similar reading strategies for both the Internet and static text, they use additional strategies as well. Teachers must help students understand how to navigate web pages to successfully comprehend the text, and they must help students understand how to make choices quickly as they read on the Internet.

Because so many children and adolescents turn to the Internet for entertainment and homework, educators must turn their attention to the strategies these Internet users employ when interacting with web sites. Obviously, as this research project indicated by the identified differences between the “navigators” and the “flouriners,” students do possess a variety of abilities to reading the Internet even when they believe they are excellent readers of this medium. Despite the amount of time spent in the electronic world of the Internet, digital natives require support as they read online sources, but the support must first begin with additional research that will provide parents and educators with crucial information so when sixteen-year-old Elizabeth and her twelve-year-old brother, Lucas, sit down to their laptops or desktop computers to do their homework, they will possess the skills they need to fully understand the sites they are consulting. Even though Elizabeth can sign into a chat room and interact with her peers and Lucas can
enter a virtual world of World of Warcraft where he can team up with his friends’ avatars to complete quests, these two teenagers need to develop reading strategies to successfully comprehend the Internet text with which they interact so freely.
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March 19, 2010

Dear parent or guardian:

My name is Heather Schilling. I am an instructor in the education department at Manchester College, and I am also a doctoral student at Ball State University. With permission from Dr. Showalter, Superintendent of Manchester Community Schools; and Dr. Reichhart, Principal of Manchester Intermediate School, this study will investigate the reading strategies used by sixth graders when they read material on the Internet. Because many adolescents spend so much time on the Internet and turn to it first for homework answers, this is important research in the field of reading. The name of the study is “A Comparison of the Reading Strategies of Above-Grade Level and Below-Grade Level Sixth-Grade Internet Readers.”

Enclosed you will find a parental consent form for you to sign giving permission for your child to participate in this research study as well as a survey for your child to complete. Information from this survey will provide important information to the researcher for selecting participants. If your child is selected as a participant, your child will be asked to come to the Clark computer lab at Manchester College on three separate occasions with each session lasting no more than half an hour. During each session, your child will be asked to complete a controlled Internet activity which I, the primary investigator, have developed. This activity will use a predetermined and age-appropriate web site which is related to the Indiana academic standards. While looking for answers to five to seven comprehension questions, much like they would do in school or for a homework assignment, your child will be asked to talk out loud (think aloud) about what is going on through his/her mind. The focus of the study is really on the strategies the child uses, not on the answers to the questions. Each of the sessions will be videotaped and a software program called Camtasia will capture the screen changes as the child interacts with the Internet site. This will allow the researcher to examine each session, looking for patterns in reading strategies.

Your child’s participation in this study is completely voluntary. You and/or your child may choose to discontinue participation at anytime and you are free to withdraw your
permission at anytime for any reason without penalty or prejudice from the researcher. As a parent, you are also welcome to be present during the Internet reading sessions. Feel free to ask any questions before and during the study. My contact information is 260-982-7010 (cell), 260-982-5265 (office), or email haschilling@manchester.edu.

While your child will not directly benefit from participating in this study, his/her willingness to participate may add to the field of education’s understanding of the reading strategies children use while they read the Internet. I

I thank you in advance for your willingness to support this research project. My purpose is to examine what types of reading strategies our students use when reading online articles. If they are different than traditional reading comprehension strategies already being taught in schools, then we will need to introduce these new strategies to students when they are in elementary school.

Please complete the attached consent form and return to Mrs. Hanback by March 24, 2010.

Sincerely yours,

Heather Schilling
Parental Consent Form for A Comparison of the Reading Strategies of Above-Grade Level and Below-Grade Level Sixth-Grade Internet Readers

Study Purpose and Rationale
The purpose of this research project is to examine the reading strategies sixth-grade students use when they read Internet articles. Conclusions from this study may indicate additional reading strategies that need to be taught in the elementary school classrooms.

Inclusion/Exclusion Criteria
To be eligible to participate in this study, your child must be enrolled as a sixth-grader, read above-grade level or below-grade level as identified by the winter NWEA scores, complete the attached questionnaire, and be willing to talk out loud with the researcher about what is going through his/her mind as she reads online.

Participation Procedures and Duration
This research project asks that your child come to the computer lab on the Manchester College campus on three different occasions to interact with an age-appropriate Internet site. Your child will be asked to read a provided web site, look for a few content questions. Each session will take approximately 30 minutes to complete, including introduction and the actual Internet reading activity.

Audio or Video Tapes
For purposes of accuracy, with your permission, the Internet reading sessions will be videotaped. The computer program Camtasia will also capture each time your child makes a click of the mouse. Any names used in the videotape will be changed to pseudonyms when the tapes are transcribed. The tapes will be stored in a locked filing cabinet in the researcher’s office for five years and then be erased.

Data Confidentiality or Anonymity
All data will be kept as confidential and no identifying information such as names will appear in any publication or presentation of the data. Code numbers will be assigned to each participant with the master list of names and codes kept in a locked filing cabinet in the researcher’s office for five years.

Storage of Data
Paper data will be stored in a locked filing cabinet in the researcher’s office for five years and then be shredded. The data, such as transcripts of the Camtasia screen captures or the videotapes as well as the questionnaire completed by your child, will be kept on the researcher’s password-protected computer at Manchester College for five years and then deleted. Only the researcher will have access to the data.

Risks or Discomforts
The only anticipated risk from participating in this study is that your child may not feel comfortable talking out loud with the researcher about what is going through his/her mind as she reads the Internet source. Your child will be informed during the assent
process that he or she may choose to quit the study at any time. S/he may also request that you are present during the study.

**Who to Contact Should Your Child Experience Any Negative Effects from Participating in this Study**
Should your child experience any feelings of anxiety, there are counseling services available to your child through the child’s school, and information can be obtained by calling 260-082-8085.

**Benefits**
The primary benefit your child may gain from participating in this research study is that s/he may contribute to which reading strategies elementary teacher teach their students to use when reading Internet sources.

**Voluntary Participation**
Participation in this study is completely voluntary for your child and you are free to withdraw your permission at anytime for any reason without penalty or prejudice from the investigator. Please feel free to ask any questions of the investigator prior to signing this Parental Permission form and at any time during the study. You can find her contact information at the bottom of the consent form.

**IRB Contact Information**
For one’s right as a research participant, you may contact the following:  Research Compliance, Sponsored Programs Office, Ball State University, Muncie, IN 47306, (765) 285-5070, irb@bsu.edu
A Comparison of the Reading Strategies of Above-Grade Level and Below-Grade Level Sixth-Grade Internet Readers

Parental Consent
I give permission for my child to participate in this research project entitled, “A Comparison of the Reading Strategies of Above-Grade Level and Below-Grade level Sixth-Grade Internet Readers.” I have had the study explained to me and my questions have been answered to my satisfaction. I have read the description of this project and give my permission for my child to participate. I understand that I will receive a copy of this informed consent form to keep for future reference.

Parent’s name (printed) ____________________________________________

Parent’s signature: __________________________________ Date: __________

Child Assent
The research project has been explained to me and I have had the opportunity to ask questions. I understand what I am being asked to do as a participant. I agree to participate in the research.

Child’s name (printed) ____________________________________________

Child’s signature: __________________________________ Date: __________

Contact Information

Address: ___________________________ Day phone number ________________

_________________________ Evening phone number _________________

Email address (optional): __________________________________________

Preferred method of contact: _______________________________________

Researcher Contact Information

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Appendix B
Internet Article Reading - Student Questionnaire

- I spend approximately ___________ hours each week on the Internet?

When you are on the Internet, what is the activity you do the most? (play games, use a search engine, download music, play on Facebook or other social networking tool, or something else)

- When I am on the Internet, I am usually ________________________________.

On a scale of 1 -5, with 5 being excellent, and 1 being not good at all, how good are you at finding information you need on the Internet? Circle the number that best corresponds with how you feel.

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<tr>
<td>not good at all</td>
<td>good</td>
<td></td>
<td></td>
<td>excellent</td>
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When you want to find something on the Internet, what do you do first? second?

- When I need to find something on the Internet, I usually do this first?

___________________________________________________________

- Then I_____________________________________________________

When you think about what kind of a reader you are of printed (not online) books, articles, and handouts given in class, how would you categorize yourself? (excellent, above average, good, not that great) Circle the number that best corresponds with how you feel.

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<td>not that great</td>
<td>good</td>
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When you think about what kind of a reader you are of Internet material, how would you categorize yourself? (excellent, above average, good, not that great). Circle the number that best corresponds with how you feel.

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<td>not that great</td>
<td>good</td>
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<td>excellent</td>
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With a little practice, how comfortable would you be talking out loud as you read on the Internet, explaining what you are thinking as you read? (extremely comfortable, sort of comfortable, not comfortable) Circle the number that best corresponds with how you feel.

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</tbody>
</table>
Appendix C

Direction to Think-Aloud Activity

Now that we have talked about and practiced how to do a think aloud, you are going to have a chance to do one for real. Your job is to find and read an Internet resource dealing with the topic on the card. Read the source just as you would for a school project. Any time you think something, say it out loud. It can be something you think about the article you are reading or it can be something about the site you are on, like a button you are going to click on. Do not worry if you forget to think aloud; if that happens, I will remind you to keep talking about what is running through your mind. We’ll wait until the end of the activity for you to tell me about what you remember from your reading. All you have to do is read your article and tell me what you’re thinking. We’ll spend about 20 to 30 minutes doing this activity. I am going to turn on the video camera so that if I get behind taking my notes while you are talking, I will have something to help me remember what you did. If you have any questions at any time, just stop and ask me. Okay?
Appendix D
Think Aloud Protocol Questions – Introduction to the Internet Activity

The following questions, based on the protocol designed by Johnstone, Bottsford-Miller, & Thompson (2006), will serve as guidelines for the think aloud portion of the study. However, they are meant to serve only as a guide. The researcher will follow the participant’s lead, asking follow-up questions, clarifying questions, and more probing questions when the participant isn’t articulate about her thinking. Phrased in a friendly manner, the think aloud probing questions are intended to be non-judgmental. In fact, students need to feel at ease with the researcher, and this can be accomplished by eliminating the feeling that she must find the “right” answer (Johnstone, Bottsford-Miller, & Thompson (2006).

- “I am interested in how young people, especially sixth-graders, read articles on the Internet, so Mrs. Hanback, your reading teacher, and I have designed some research questions for you that will help you understand the time period better before you read the next book for your reading class.”
- “You can see from this list that they are broad questions. Mrs. Hanback is interested in what type of information you can find that will help the class understand the time period, but I am more interested in how you are thinking about what you are reading online.”
- “Have you used the Internet before to find information?”
- “What you say today is really important to our project, so we are going to turn on the video camera so that later when I try to remember what you told me, I can go back to double check my notes. The camera will be behind us, so we might even forget it is running.”
- “I’m going to show you what think aloud looks like while I read this practice article on the Internet. I will say everything that is going through my mind when I read the words, look at the graphics, and think about the different hyperlinks I can pick.” (Demonstrate the think aloud method with a short excerpt)
- “Why do not you try thinking out loud while you read this fun page on the Internet? Do not worry about what you are saying or thinking. Try to just say what comes to your mind.” (Give the participant a chance to practice the think aloud)
- “This is just supposed to be a fun activity to find information about the time period before you read the really great book Mrs. Hanback has picked for your class. What I can’t wait to find out is what you are thinking when you read information on the Internet. Do you have any questions about what we just did?”
Appendix E
Sample Internet Session

For each of the online reading sessions, the following steps will be taken. When the participant arrives at the institution’s computer lab, the researcher will greet the parent/guardian and the participant and describe the purpose of the research. The researcher will walk the participant to the lab which will be set up for the session. Once the participant has settled into the chair at the computer, the researcher will remind the participant of what is going to happen during their session. She will also remind the participant that the sessions will be videotaped and each time the participant clicks the mouse and moves to a different part of the web page, a program called Camtasia will record those movements. Before beginning the actual Internet reading assignment, the researcher will ask the participant a few pre-reading questions to establish what the participants already know about Ancient Egypt. The researcher will then show the questions she would like to answer by reading the web site. As the participants read the Internet web site to find the answers to the questions, they will be asked to think out loud.
Appendix F
Internet Reading Session One

TASK

Today you are going to investigate what life was like for the Ancient Egyptians. You will use the web site the researcher has found for you to find answers to the questions listed below. The researcher already has the web site pulled up on the computer for you. Today you will be looking at a web site called “The Horizon to Ancient Egypt”
(http://www.akhet.co.uk/)

- Before starting, please read through the questions below.
- Every time you make a decision about where to go next or when you look somewhere else on the web page, be sure to tell the researcher what is going through your mind. If you forget to tell what you are thinking for more than three seconds, the researcher will remind you.
- You do not need to write anything down. Just tell the researcher what you find and she will write it down on her paper.
- Remember, this is just to help the researcher find out what kind of strategies sixth-graders use when they read Internet resources. This is not for a grade and if you feel uncomfortable, you can stop at any time.

QUESTIONS

- Who was Akhenaten?

- In what year did work on the Royal tomb begin?

- Why did rulers in Ancient Egypt have statues of themselves built?

- When people think of Ancient Egypt, they think of their art, especially the mummy mask. Whose mask is the most famous?

- What are some of the things found in King Tutankhamun’s tomb?
Appendix G
Internet reading session two

TASK

Today you are going to investigate the Soviet Union. You will use the web site the researcher has found for you to find answers to the questions listed below. The researcher already has the web site pulled up on the computer for you. Today you will be looking at a web site called “Soviet Union” (http://encyclopedia.kids.net.au/page/so/Soviet_Union)

• Before starting, please read through the questions below.
• Every time you make a decision about where to go next or when you look somewhere else on the web page, be sure to tell the researcher what is going through your mind. If you forget to tell what you are thinking for more than three seconds, the researcher will remind you.
• You do not need to write anything down. Just tell the researcher what you find and she will write it down on her paper.
• Remember, this is just to help the researcher find out what kind of strategies sixth-graders use when they read Internet resources. This is not for a grade and if you feel uncomfortable, you can stop at any time.

QUESTIONS

1. Who was Joseph Stalin?

2. What were some of Joseph Stalin’s names?

3. How did Stalin change the Soviet Society?

4. What ethnic groups lived in the Soviet Union?

5. How many republics made up the Soviet Union?

6. What countries were involved in the Cold War? Why was the Cold War fought?

7. What year did the Soviet Union fall apart? What led to this break up?
Today you are going to investigate the climate change. You will use the web site the researcher has found for you to find answers to the questions listed below. The researcher already has the web site pulled up on the computer for you. Today you will be looking at a web site called “Climate Kids: NASA’s Eyes on Earth.”

(http://climate.nasa.gov/kids/index.cfm)

- Before starting, please read through the questions below.
- Every time you make a decision about where to go next or when you look somewhere else on the web page, be sure to tell the researcher what is going through your mind. If you forget to tell what you are thinking for more than three seconds, the researcher will remind you.
- You do not need to write anything down. Just tell the researcher what you find and she will write it down on her paper.
- Remember, this is just to help the researcher find out what kind of strategies sixth-graders use when they read Internet resources. This is not for a grade and if you feel uncomfortable, you can stop at any time.

QUESTIONS

1. Why is carbon important?

2. What is climate change?

3. How can a little change in the temperature melt ice caps?

4. Is there a relationship between cold winters and global warming?

5. What is happening in countries like India?

6. How do researchers know global warming is happening? What proof do they have?
Appendix I

**Before reading**
Constructing a goal for reading
Overviewing (skimming text)
Deciding to read/focus on only particular sections of text
Deciding to not read the text
Activating prior knowledge and related knowledge
Summarizing what was gained from previewing
Generating an initial hypothesis about content of the text

**During initial reading of text**
Generally beginning to end reading of text
Reading only sections believed to contain critical information
Skimming
If text is easy, read with automatic processes and few conscious strategies
Reading aloud
Repeating/restating text to hold in working memory
Repeating/restating a thought that occurred during reading
Making notes
Pausing to reflect on text
Paraphrasing part of the text
Explicitly looking for related words, concepts, or ideas in text and using them to construct main idea, gist, or summary
Looking for patterns in the text
Predicting/substantiating predictions about content of text
Resetting reading/learning goals at a different level of understanding because text suggests more appropriate goal
Identifying important information in text (e.g., looking for what is “news” in text and looking for keywords, topic sentences, topic paragraphs)
Conscious inference making (e.g., inferring referents of pronouns, filling in gaps, inferring the meanings of unfamiliar vocabulary words, making inferences about the author and deducing implied conclusions)
Integrating different parts of text (e.g., by holding representations of different parts of text in working memory, looking back and forth in text to pull meanings together, rereading text to increase connections, and making notes to assist integrative understanding)
Interpreting the text
Monitoring characteristics of text and the processing of the text (especially problems in processing text)
Reacting when problems during reading are detected (e.g., rereading for clarification, deciding to slow down and read more carefully, and deciding to just keep reading in hope that he meaning will become clearer later in the reading)
Evaluating (e.g., accepting and being skeptical—about both style and content of text)
After reading
Monitoring that the text is understood and deciding not to process text additionally or monitoring that more processing is required to get the meaning of the text
Rereading after the first reading
Recitation of text to increase memory of it
Listing pieces of information in text
Listing pieces of information
Constructing cohesive summaries of text
Self-questioning, self-testing over content of text
Imagining how hypothetical situations might be viewed in light of information in text
Reflecting on information in text, with possibility of shift in interpretations as reflection proceeds
Rereading parts of text following reflection in order to rethink text based on insights gained during reflection
Continually evaluating and possibly reconstructing an understanding of the text
Changing one’s response to a text as the understanding is reconstructed
Reflecting on/mentally recording text in anticipation of using it later