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Two Marginalized Adolescents Using the Internet to Complete an Inquiry Project

Jennifer Thomas

Brigham Young University - Provo

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Two Marginalized Adolescent Readers Completing an Internet Inquiry Project

Jennifer Thomas

A thesis submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of

Master of Arts

Timothy G. Morrison, Chair
Janet R. Young
Erika Feinauer

Department of Teacher Education

Brigham Young University

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ABSTRACT

Two Marginalized Readers Completing an Internet Inquiry Project

Jennifer Thomas

Department of Teacher Education

Master of Arts

This qualitative study focused on the strategies that two marginalized seventh graders used as they completed an Internet inquiry project about survival. The participants spent time over a four-week period in three phases—selecting a topic, locating information, and presenting information. Participants completed journals and participated in interviews. The participants' online searches and how they organized their presentations were recorded. The researcher took field notes. These four data sources were used to determine subcategories in each phase to document the strategies they employed as they completed the project. Participants used phrases and questions as they decided on key words to locate information. The majority of the sites they visited ended in the .com domain. They used different web browsers and spent varied amounts of time reading websites once they decided on key words and selected sites. Each participant approached the project uniquely and met the requirements to complete it.

Keywords: Internet, inquiry, new literacies, marginalized adolescents, collaboration

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Chapter 1: Introduction

Adolescents are entering a world that requires them to read and write more than at any other time in history (Moore, Bean, Birdyshaw, & Rycik, 1999). Language, text, and discourse are more prevalent than raw materials in jobs today (Luke & Elkins, 1998). This has changed the nature of the workplace. Rather than being product-based, it is team-based (Leu, personal communication, 2011). Language becomes the tool for solving problems and working with people. The Internet is a tool one can use to solve problems. With this change in the workplace, it is imperative that adolescents learn effective strategies, especially for online research, to solve problems and communicate with others. The rest of this chapter focuses on adolescents' digital world, adolescents who are marginalized readers, Internet use in schools, and Internet inquiry. A section stating the problem followed by the research question and limitations conclude this chapter.

Adolescents' Digital World

Adolescents know that computers and the Internet are essential for communication and research (Eagleton, Guinee, & Langlais, 2003). Sutherland-Smith (2002) stated that the Internet is constantly changing. It is difficult to manage, but learning how to navigate it is essential for survival in the 21st Century. Therefore, adolescents must develop strategies for navigating the Internet effectively. These strategies may include choosing search terms, checking the reliability of information, browsing, deciding if the information is relevant, and reading information on the site (Dalton & Proctor, 2008).

Due to the massive amount of information that is available, especially online, adolescents' current literacy skills and strategies do not always match the demands of living in an information age that is not slowing down (Alvermann, 2002). Technology is changing literacy

at an unprecedented rate. As new technology becomes available, the literacies required to access them are new as well. The literacy skills adolescents need to maintain the pace that new technology requires is only increasing. Simply reading a webpage requires adolescents to use strategies that differ from updating their Facebook status, reading a book on an iPhone or Kindle, or sending a text message. Technology and the new literacies that come with it are improving and changing adolescents' literacy skills.

While adolescents' literacy skills are improving, Windschitl (1998) explains that research with the Web has given us information about how students use hypertext to navigate virtual space and how individuals learn from computer-based text. He suggests that more research is needed to analyze how students access, use, and learn from the information they find. Looking at the underlying factors in Internet searches among adolescents will help researchers examine the strategies adolescents use as they search.

Many adolescents use strategies to participate in social networking, blogging, or downloading music and videos, but some are not adept at finding information (Leu, personal communication, 2011). Even if some adolescents are online mainly for social reasons, the Internet may provide a vehicle that is motivating for them to use in a more formal school setting (Alvermann 2002; Kuiper & Volman, 2008; McNabb, Thurber, Dibuz, McDermott, & Lee, 2006; Moore et al., 1999; Pitcher et al., 2007). For example, adolescents experience new literacies in the following examples: searching topics online that are interesting to them, texting their friends or updating their Facebook or MySpace pages; reading online; downloading music; and searching topics of interest (Kuiper & Volman, 2008; Lenhart, Rainie, & Lewis, 2001; Pitcher et al., 2007); reading emails, webpages, blogs, or nings; (IRA, 2009), and creating various identities in an anonymous environment (Gross, 2004).

Adolescents Who are Marginalized Readers

Some adolescents are computer literate outside school and can easily solve problems. On the other hand, in school, marginalized adolescent readers are not connected to literacy in classrooms—they are not engaged with the reading or writing done in school (Moje, Young, Readence, & Moore, 2000). Additionally, these researchers state that students may be marginalized for social reasons—race, class, gender, or sexual orientation. Adolescents who are marginalized do not fit in the mainstream school culture; however, their literacy needs and strategy development cannot be ignored.

Similarly, Moje et al. (2000) indicated that adolescents who struggle in school are often different people outside the classroom. For example, adolescents can demonstrate literate abilities in many ways including sharing specific scientific information, speaking or writing another language, dancing, and telling family stories. Many adolescents who are used to failing with print text are often successful using other literacies to explore their individual interests (Alvermann, 2002; Moje et al., 2000; O'Brien, 2003). They are often more interested in using nontraditional literacies (McNabb et al., 2006; Moje, 2008). Again, nontraditional texts (e.g., websites, music, lyrics) are more compelling to students according to a survey of adolescent literacy practices (Moje, 2008). Adolescents want to use literacies—film, the Internet, music, television, magazines, newspapers, phones, pagers, cell phones, computers, art, video games, and email—that impact their daily lives (Moje et al., 2000). O'Brien and Scharber (2008) state that students “gravitate to and use ‘new’ digital literacies when the school day is over” (p. 67). However, in school, they still need guidance as they continue to develop as readers.

In terms of literacy, adolescents have unique reading needs, which can be addressed using nontraditional literacies (Alvermann, 2002; Moore et al., 1999). Regardless of the texts

that educators use, adolescents still need to reach the advanced stages of literacy (Moore et al., 1999) while learning the practices associated with literacy (Moje et al., 2000). For example, Moore et al. (1999) maintain that adolescents need support as they learn new vocabulary, develop writing styles, adjust reading styles, and apply complex learning strategies to print.

Adolescents need to be guided through their development as readers. Unfortunately, content-area teachers may not believe that it is their responsibility to teach students how to read and write (Moore et al., 1999). A reason may be that most adolescents know how to read, and educators assume that they should be able to access a variety of texts. Educators may not realize, however, that discovering the meaning or value of each text is different and that they should be teachers of reading (Moje et al., 2000). For example, reading a textbook requires adolescents to use different strategies than reading a novel. Accessing texts requires adolescents to use multiple strategies—decoding, summarizing, making connections, analyzing, synthesizing, rereading, and asking for clarification, to name a few. To show an example of developing readers, O'Brien (2003) completed a four-year study with high school students to see how using multiliteracies impacted at-risk adolescents. He noted that what counts as text in school may be restrictive for many adolescents:

The negative way in which [adolescents] are currently positioned is relative to a restrictive, singular view of literacy that privileges print. As our notions of what counts as literacy and text evolve, so should our conception of the value of working in media projects. (p. 1)

An aspect of the media projects includes new literacies. Leu, Kinzer, Coiro, and Cammack, (2004) state that a precise definition of new literacies may never be developed because a central characteristic is that they change regularly. However, four common elements define the larger

theory of New Literacies. These elements are: (1) “the new skills, strategies, dispositions, and social practices required by new technologies for information and communication; (2) central to full participation in a global community; (3) changing regularly as their defining technologies change; (4) multi-faceted, and our understanding of them benefits from multiple points of view” (Castek, Zawilinski, McVerry, O’Byrne, & Leu, in press, p. 4).

Internet Use in Schools

Technology and a broad view of literacy that includes new literacies can address and expand adolescents’ literacy development. Teachers can give students more opportunities to use the media they are comfortable and familiar with in school. One result of doing this is that adolescents’ attitudes toward literacy may change as they are successfully using other literacies (O’Brien, 2003). Furthermore, as new literacies are incorporated into classrooms, more adolescents who struggle may find a way to be successful in school (Moje et al., 2000) because the Internet is easier for them to use than other print sources (Agosto, 2002).

O’Brien (2003) states that students who are not interested in print texts in school are often aware of or connected to popular media texts outside school. Adolescents are curious (McNabb et al., 2006), especially about the latest game systems, computers, or other technological trends; they want to experience them. The Internet already is a huge part of adolescents’ lives (IRA, 2009), as they spend time using it for various reasons. It is critical that teachers engage students with the literacies that they are familiar with and that will prepare them to solve problems in an increasingly digitally literate world. While adolescents are familiar with technology, they must learn how to negotiate texts in many settings (Luke & Elkins, 1998), including the Internet, to be successful in an increasingly literate world.

A specific method for assisting adolescents who are marginalized in an increasingly literate world is to make Internet inquiry part of the curriculum. According to Farwick Owens, Hester, and Teale (2002), inquiry projects are especially beneficial for underachieving students when teachers get to know students through their inquiry projects. These researchers indicate that underachieving adolescents' academic skills improve because teachers see what the student can do in the project rather than focus on the academic skills a student lacks. Internet inquiry may appeal to some adolescents because the teacher is not directing every step of the learning, the topic for research may be more individual, and collaboration may take place more readily than if more traditional teaching methods were used to instruct students. For this study, collaboration means that at least two people work together to solve a small problem, such as answering a question, assisting with features in programs, asking for the correct spelling of a word, or sharing information about a search. By this definition, collaboration does not mean that two or more people are working together on the same Internet inquiry project. Leu and Kinzer (2003) define Internet inquiry as individuals or groups posing an important question, then finding answers to their queries. Coupled with the change in classroom environment that may be more student-directed and collaborative is the idea that teachers who provide productive conditions for learning and allow their students' interests to be part of the classroom ultimately help students grow (Moore et al., 1999). Further, Internet inquiry allows teachers to integrate traditional subject areas and language arts in powerful ways (Leu & Kinzer, 2003).

Although Internet inquiry is beneficial, it may not be easy to bring new literacies into classrooms. There are two general ways to do Internet inquiry projects and use new literacies in classrooms. One is an open-ended project—using technology to solve authentic problems (Land, 2000). Another is an Internet workshop—a unit of study that is teacher-directed (Leu & Kinzer,

2003). Thakkar, Bruce, Hogan, and Williamson (2001) suggest that inquiry-based projects successfully promote learning. Eagleton et al. (2003) assert that the Internet is a unique and rich source for authentic inquiry. Internet inquiry projects may be a way to facilitate learning while addressing the needs of all students and making a curriculum more appealing to individual students.

Statement of the Problem

Internet inquiry projects may make the curriculum more individual, but more research is needed about specific elements of inquiry. Conley (2008) states that substantial research has been done with adolescent literacy, but little is known about adolescents' strategy development. One way to study how students access and use the Web is to analyze the strategies they use to complete meaningful inquiry-based curriculum projects, which require students to take a more active role in their own learning (Moore et al., 1999). A specific area of focus in terms of strategy development is analyzing the strategies that adolescents who are marginalized use as they locate, organize, and present information from online searches.

Leu et al. (2004) suggest that scientific data is needed to discover the skills students use as they prepare to read on the Internet. These researchers also state that educators need to focus on how to support "students with special needs with the powerful new technologies that are available to us" (p. 25). Using the Internet to document the strategies adolescents use as they search may assist them in becoming more intelligent consumers of the messages presented in popular media (Moje, 2000). All adolescents, especially those in the margins of our classrooms, have a lot to teach us (Dalton & Proctor, 2008), and deserve more than a centralized, one-size-fits-all approach to literacy (Moore et al., 1999). Being literate no longer means simply learning to read and write. Adolescents have to learn how to use technology for social and other reasons

to be successful in a digital world (Moje et al., 2000). While research about the use of new technologies in educational settings is increasing, more specific information is needed regarding the processes used by particular groups of students as they access information online.

Research Question

This study answered the following question: how did two seventh grade marginalized readers use new literacy strategies to locate, organize, and present information as they completed an open-ended Internet inquiry project?

Limitations

Two students were studied to delve deeply into how they used strategies to locate, organize, and present information. It was necessary to use a small sample size in answering the question because the sources yielded detailed data. A larger sample size for the scope of this study would not have allowed for detailed analysis of the data. The data obtained in this study do not permit results to be generalized to other students. However, it is possible that the data gathered in this study could be used as the basis for a future study involving a larger sample size.

Chapter 2: Review of Literature

This chapter examines four broad issues related to Internet inquiry: First, technology challenges for adolescents are explained. Second, technology and marginalized adolescents are examined. Third, the uses of technology in education are discussed. Fourth, a section about challenges teachers may have as they implement Internet inquiry into their classrooms is also outlined.

Technology Challenges for Adolescents

Today's adolescents have grown up with technology (Prensky, 2001). However, many adolescents need help to effectively use technology to solve problems and answer questions. Effective strategy development is especially essential for students/adolescents who struggle or feel marginalized with reading. If reading is challenging for marginalized adolescents, learning how to read online may bolster their confidence for offline reading. Leu (personal communication, 2011) indicates that marginalized readers may be more successful if they are provided with online reading opportunities before they are given offline reading tasks.

Internet use among adolescents might not be as prevalent in their classrooms as it is in their homes. Even though the Internet was not designed for children, nor was it intended to be used for "knowledge construction" in an educational setting, adolescents use it frequently (Kuiper & Volman, 2008, p. 261). Since 98% of schools have Internet access for their students, it is logical to use it to help students analyze, synthesize, or comprehend texts (Lenhart, et al., 2001; Schmar-Dobler, 2003).

In terms of instructing students about various strategies for accessing texts, educators need to know that with Internet searches many adolescents are clickers and lookers (Leu, personal communication, 2011). Leu explains that such adolescents frequently search the results

page from a search by clicking and looking at the sites, which at times is an ineffective strategy. One problem with this strategy is that adolescents may not read texts when they simply click and look.

Adolescents may not know how to locate pertinent information to solve a problem or answer a question on a specific website (Baildon & Baildon, 2008; Kuiper & Volman, 2008). Furthermore, challenges for adolescents may arise as they seek to find relevant and reliable information to answer their questions or expand their interest in a topic (Baildon & Baildon, 2008). Most adolescents could probably benefit from instruction in dealing with the vast amount of information available on the Internet (Kuiper & Volman, 2008).

Using the Internet in classrooms for more formal searches may be difficult because it requires students to use multiple strategies in selecting a topic, locating information, and presenting their findings. Therefore, teachers could incorporate the Internet and teach the skills, strategies, and dispositions necessary for accessing new literacies that accompany online researching (Leu, et al., 2004). Teaching adolescents specific skills and strategies to use while online is likely to improve their general literacy skills, help them make informed decisions, collaborate with peers, and clearly communicate their ideas to others. Researchers need to continue dialoguing with students at every age about judging sources and making sense of the information they find as they engage in the research (Baildon & Baildon, 2008).

Strategy Development

Communicating with groups of students about the strategies they may implement as they search online may help educators analyze the skills they use. These strategies may include choosing a browser, deciding on search terms, selecting a site, deciding what to look at or click on while on the site, deciding how long to stay on the site, evaluating the information, or

checking the reliability of the site. Additionally, adolescents have to decide if the information they read, view, or hear will answer their question or fulfill the purpose of their search. Also, adolescents may strategize differently at various points of a project. It may not be possible to compose a comprehensive list of strategies because each person approaches a problem differently. However, some studies have been done that involve adolescents' strategy development, which may begin to give educators a sense of how students approach online research.

Studies Related to Strategy Development

In one study about strategy development, Coiro (2005) studied the reading comprehension processes of a small group of sixth graders as they read informational websites for facts about hurricanes. Coiro used observations to develop four strategy lessons that could assist students as they located information in a digital environment: following links, navigating within a website, knowing if the information on the site is true, and synthesizing without copying. However, it is important to keep in mind that adolescents' natural Internet search strategies are more complex. More research is needed to discover the specific strategies adolescents use as they search the Internet.

Another study conducted by Coiro and Dobler (2007) explored the issue of online reading comprehension strategies. In their study, 11 skilled sixth grade readers pursued information using the search engine Yahoo!igans and informational texts online. They also sought to answer the questions, "What characterizes the reading process as skilled readers search for and locate information on the Internet? What informs the choices that skilled readers make while reading for information on the Internet?" (p. 221).

Once participants were selected, they completed two reading tasks: one was based on a multilayered site about tigers, and the second required participants to choose one of two questions to answer. Researchers asked students to explain their thinking as they searched for answers to the question. Sometimes the researchers asked participants to explain why they chose search terms, looked through a search results page, decided to visit a site, and how they strategized to find pertinent information on each website. Students then answered questions related to their strategy use during follow-up interviews with a researcher.

In Coiro and Dobler's (2007) study, researchers analyzed data sources—field notes, transcripts from interview sessions and think-aloud sessions, and questionnaires—following a grounded-theory model. Results of this study show that four aspects of participants' background knowledge were used as they read websites: activation of knowledge of the topic in general, knowledge of how websites are structured, knowledge of informational text structures, and understanding of Web-based search engines. Another result is that participants were able to make appropriate inferences as they searched online. An additional finding is participants used self-regulation, “the dual metacognitive processes of evaluation and regulation that occur during reading,” (p. 234) as they searched online. A final finding is that participants employed the cognitive strategies of planning, predicting, monitoring, and evaluating as they searched for information online.

While not directly related to reading comprehension online, Eagleton and Guinee (2002) suggested ideas to support students completing Internet inquiry projects. These researchers stated that Internet inquiry includes understanding the inquiry task, categories associated with a topic, the information space, keywords, and search engines. First, students have to synthesize information from multiple sources. Second, Internet inquiry requires students to actively search

for content. Next, anyone can publish on the Internet. Teachers and students have to be mindful of these three points, and many others, as they research.

In a similar study, Sutherland-Smith (2002) generated a list of specific strategies teachers and students can use as they complete Internet inquiry projects. The purpose of Sutherland-Smith's study was to explore the unique reading strategies that students employ as they access information on the Internet. Her study took place in two sixth grade classrooms in Australia with 48 participants. She gathered data from observations and informal interviews with participants. Sutherland-Smith and the classroom teachers in the study developed the following strategies for teaching students how to read texts online: (a) refining keyword searches, (b) providing clear search guidelines, (c) teaching students how to break a complex topic into manageable sections, (d) teaching them how to deal with frustrations related to technology, (e) limiting the sites they visit, and (f) providing instruction on how to evaluate nontextual features. A list of strategies teachers may decide to use as they develop lessons about effective Internet searches is becoming available.

A study related to Sutherland-Smith's (2002) about reading strategies is one conducted by McNabb et al. (2006). These researchers provided teachers with guidelines on how to effectively teach seventh and eighth graders to search for information online. The librarian and teacher conducted the two-week study. They added an online component to an already existing unit about the human body. Participants in this study were to required to use three different types of sources to explain how each of the 10 systems in the body function and relate to each other, and include any at-risk health behaviors related to the system. They were guided in their research by the question "Is one body system more important than any of the others?" (p. 66). Adding the online component posed a problem with searching for information about the human body online.

To deal with this, the researchers were granted permission from a district administrator to unblock sites that would be beneficial for students as they researched the human body.

Researchers taught mini-lessons to the whole class to facilitate students researching more efficiently as individual students had questions. Also, the librarian taught students to evaluate hoax websites so they could determine if a site was credible or not. Instruction was given about strategies to identify copyright information, evaluate a website, and determine if a site is a hoax.

Furthermore, data led the researchers to conclude that using the Internet as a tool for research is more motivating than using print texts and it allows students to explore a topic deeply (Eagleton & Guinee, 2002; Farwick Owens et al., 2002). Additionally, students needed instruction on how to focus on a search as well as learning critical reading skills so they could understand what they read online.

A study that analyzed student's online strategy use was conducted by Bilal (2000) as she examined the cognitive, physical, and affective behaviors of 22 seventh grade science students who used Yahoo!igans. She also wanted to measure how successful children were as they completed fact-based searches. She compared the cognitive and physical behaviors of successful and unsuccessful searchers. Bilal also developed a new measure to quantify how students find information. Lastly, she investigated the relationship between prior experiences and their success using Yahoo!igans.

In this study, participants were required to find out how long alligators live in the wild and how long they live in captivity. They completed their research under the supervision of the researcher and school librarian, rather than during class time. Researcher-developed instruments—a quiz, teacher assessment of student characteristics, and an exit interview—were used to analyze participants' behaviors. Bilal developed a "Web Traversal Measure" that

categorized moves or strategies participants used to answer the question about alligators. These moves included searching, browsing, looping, backtracking, screen scrolling, and moving the mouse strategically.

Results from this study showed that, first, participants were comfortable with their problem-solving process. Second, using the *back* button seemed to be common among Web users, regardless of age or experience. Third, participants were successful when they strategized their searches to contain multiple or single concepts. Fourth, unsuccessful searchers used concepts and natural language phrases. Fifth, successful searchers had more effective search strategies and made fewer moves than unsuccessful ones. Additionally, successful searchers scrolled more, navigated more hyperlinks, and examined more homepages than unsuccessful searchers.

From these studies, information about how skilled readers completed online research when they were given preselected sites to access during the project is becoming available. Instructors providing timely mini-lessons have also guided students through online research. The cognitive, affective, and physical demands of online research for a small population of seventh graders have been studied. However, more studies are needed to analyze the specific moves that are made by adolescents who are marginalized as they search the Internet. Discovering the strategies that less skilled readers use as they naturally search for information to complete an Internet inquiry project may give educators insight into how specific groups of adolescents strategize while online. Also, learning about these strategies may assist educators in teaching students how to access information on the Web without making search moves that are ineffective.

Technology and Marginalized Adolescents

The Internet is part of adolescents' present and future literacy, so using it as a text in classrooms may assist students who have a hard time with print-based texts in becoming more motivated and interested in academics (Dalton & Proctor, 2008; McNabb et al., 2006). Based on traditional definitions of literacy, adolescents who face challenges with literacy are positioned as learning disabled, minimally literate, [or] aliterate (O'Brien, 2001). Yet this does not have to be the case because incorporating multiple literacies in classrooms may change or eliminate the at-risk or marginalized labels (Moje et al., 2000; O'Brien, 2001).

It may be that when teachers only use a few texts in their classrooms, they are overlooking adolescents' real life literary practices (Moje, 2008). Moje explains that adolescents need opportunities to demonstrate their knowledge of a concept in a variety of representational forms and that connecting subjects and adolescents' lives outside school to the content in classrooms is beneficial. The Internet is a representational form available to students at school. Sutherland-Smith (2002) states that the impact the Internet is having on society and education cannot be ignored; therefore it should be in classrooms. While it may not be as prevalent in classrooms, the Internet is part of adolescents' literacy outside of school.

Benefits of the Internet

Many are concerned about the literacy abilities of students in the United States as they graduate from high school. The issue paper titled, "Every Young American a Strong Reader," given at The High School Leadership Summit shows that:

American adolescents cannot read well enough to get a job with a career path, participate in civic responsibilities, or simply enjoy a good book. Theirs is a world diminished by the inability to translate written words into meaningful thoughts and ideas. This low level of

practical literacy threatens to leave behind millions of America's youth at a time when workplace and society require higher levels of reading, writing, and oral communication than ever before. (US Department of Education, 2003, p. 1)

Regardless of the texts they read, many adolescents have developed the decoding skills they need to access a variety of texts. However, adolescents continue to need assistance with creating meaning in texts. They have to acquire the skills to handle the flood of information presented to them while learning to survive and thrive (Alexander, 2005; Moore et al., 1999) in the world. The need for secondary teachers to continue teaching reading is essential when one considers that fewer than 5% of the adolescents in the 1998 NAEP study could expand the meaning of a text and fewer than 6% of the students who participated in the study could read at an advanced level (Alvermann, 2002; Moore et al., 1999). These statistics indicate that adolescents still need assistance analyzing, synthesizing, and comprehending texts. The Internet is a text that can be used to assist adolescents in improving their comprehension or literacy skills in general.

The Internet may ease the burden of comprehension for adolescents who are marginalized. In secondary grades, many adolescents do not comprehend grade level texts. Reading requires more effort as the texts they read are frequently expository (Biancarosa & Snow, 2004; Saenz & Fuchs, 2002). Comprehension may improve through Internet use because the content on a website can be accessed with less frustration compared to using a textbook to find the same information (Kuiper & Volman, 2008). Furthermore, Windschitl (1998) asserts that the Internet has "rich imagery" that will stimulate adolescents' interest quicker than the "stale resource materials" that may reside in some classrooms (p. 29). The Internet is interactive compared to a textbook and brings a different definition of text with it.

The definition of text expands when the Internet is used. It has the ability to “read the reader” (Dalton & Proctor, 2008, p. 297). This is especially apparent when search terms are used because these terms determine which sites appear on a search results page. An example of the Internet reading the reader is when a search for a topic brings up sites connected to the original search terms. The searcher has to determine if the site is relevant to his or her initial question. On the search results page, a site that is completely unrelated to the searcher’s query may appear because the search terms are connected to that particular site. Adolescents may have difficulty distinguishing between relevant and irrelevant sites from a search because they do not have the skills to search for “high quality information” (Eagleton & Guinee, 2002, p. 39). These researchers indicate that this could happen for a variety of reasons—students may not have a lot of formal research experience. Also, students may not know how to choose effective search terms because they may be pressed for time or are inclined to find information quickly.

Challenges of Internet Use

In addition to these difficulties, another problematic aspect of using the Internet in schools to complete assignments may cause adolescents to be passive researchers and think that answers to queries come ready-made (Kuiper & Volman, 2008). A list of search results appears instantaneously after search terms are entered. Potential answers to a question are there, but adolescents have to strategize about which sites to view to decide if the information presented there really does answer their initial question.

Along with deciding which sites to view, the amount of information about a particular topic can be limitless (Dalton & Proctor, 2008; McNabb et al., 2006). Because of this, adolescents may not know when to stop searching. Furthermore, adolescents may find an answer to a question on one site and assume they are done searching. Students may be reluctant or not

know how to corroborate the information they found with another source (Damico & Baidon, 2007; Metzger, 2007). It is imperative, then, that adolescents learn the strategies for checking the information they find. Answers may appear quickly, but that does not make them correct.

As students strategize about which sites to view, a website's domain may impact which sites they select. Liu and Johnson (2004) assigned 130 preservice college students to evaluate 1,025 sites ending in the web domains .edu, .gov, .org, and .com. Students evaluated the sites based on accuracy, authority, currency, coverage, and verifiability. Metzger (2007) identified objectivity—the purpose of the site—as an additional factor people should consider as they examine the credibility of websites. Liu and Johnson (2004) found that participants felt that domains ending in .edu were the most accurate. Domains ending in .gov were considered the most authoritative and verifiable. Sites ending in .com were judged to contain the most current information and content on websites ending in .org were viewed as lower in quality compared to the other four domains.

Marginalized Adolescents

Despite the potential challenges of online research, one subpopulation in schools that may benefit from the integration of technology is adolescents who are marginalized. These adolescents may be marginalized for social or academic reasons; they do not fit in with the population of the school (Moje et al., 2000). In this study, participants were considered to be marginalized because they spent time in a resource setting. At the time of the study, participants were unable to access the general education reading curriculum the way their same-age peers could access it.

In terms of academics, students who are marginalized are often placed in classes that intend to assist them in acquiring the skills they need to access the general education curriculum

(O'Brien, 2003). However, O'Brien suggests that adolescents who spend a prolonged amount of time in corrective programs may develop negative perceptions of their abilities. Many adolescents who are marginalized and have been unsuccessful with printed texts throughout elementary school no longer care to try reading more (Alvermann, 2002). To address this concern, teachers may decide to design curricula that are engaging and use a variety of texts to help students discover their reading preferences (Frey, Fisher, & Moore, 2005; Moje et al., 2000).

Teachers can capitalize on adolescents' individual literacy interests to help developing readers learn the skills they need to be successful. Adolescents should not have to experience a motivational slump as the literacy demands in secondary schools become more difficult (Alexander, 2005). Also, traditional methods teachers use to present texts may be disabling for some adolescents (Alvermann, 2002). Adolescents' literacy needs may be more accurately addressed when the Internet is incorporated into classroom instruction.

Some researchers (e.g., Dalton & Proctor, 2008; Eagleton & Guinee, 2002; Eagleton et al., 2003) indicate that students may have challenges with Internet inquiry for various reasons. These challenges may include an overabundance of information, features that are distracting, or information that is poor in quality. Other potential challenges could include choosing search terms, evaluating sites, and using information for various purposes present literacy demands for anyone who uses the Web.

The Internet is not always user-friendly, yet traditional print texts are not easy for some students to access either (Alvermann, 2002; Moje et al., 2000). Interdisciplinary projects, either open-ended or Internet workshops, are a vehicle for getting marginalized adolescents to improve their literacy skills. Moje et al. (2000) define interdisciplinary projects as opportunities for

students to formulate questions, collaborate, and use technology. Marginalized readers can demonstrate their critical thinking skills when a variety of mediums are used to assess their knowledge.

Despite the challenges of using the Internet in schools, it levels the playing field (Dalton & Proctor, 2008; O'Brien & Scharber, 2008) because each student has access to the same text. No one is excluded because he or she could not afford to buy the book, uniform, or rent the instrument. Furthermore, Kuiper and Volman (2008) propose that the Web is a democratic medium because designing a website is not limited to a select group of people. Anyone with an Internet connection has equal access to the information on the Web.

Even though access to information on Internet is equal for those with an Internet connection, using the Internet in schools may be a way for students who have learning difficulties with print text to increase their reading and academic achievement (Dalton & Proctor, 2008). Descriptions of three studies outlining how marginalized students have been successful using technology follow.

To show how technology can be integrated into instructional settings, Farwick Owens et al. (2002) orchestrated two projects with 100 students between the ages of seven and 15. For eight weeks participants worked with university students and other members of the community to create inquiry projects that they presented to their families and other adult visitors. One outcome of this section of the study was that students were eager to design and present their projects. Another outcome was that students were motivated to learn from each other.

Initially in this project, only four computers were available for students to use so they relied on print sources to find information. Even though their reading and writing skills improved as they participated in this project, students' presentations resembled traditional reports.

Eventually, they received a federal grant to purchase technology, and the participants' approach to the projects changed.

Results of these projects indicate that first, a teacher's enthusiasm for what is being taught is essential. Second, students have to learn how to select a topic that can be focused. Third, students have to decide which websites are helpful for their searches. Fourth, teachers have to be facilitators of projects by discussing, asking questions, and monitoring each student's progress during the project.

In a similar study about marginalized adolescents being successful with technology, O'Brien (2001) conducted a study related to the Literacy Lab. In this study, he notes that adolescents who have an "at-risk" label are "capable and innovative" as they use media literacy (p. 1). To discover this, O'Brien gathered data from field notes, videotaped sessions of students collaborating, transcribed segments of videotapes, and collected "digital versions of students' productions" (p. 1).

Results of this study show that students who are labeled at-risk can master intermediality, or "the ability to work with diverse symbol systems in an active way where meanings are received and produced" (Semali & Pailliotet 1999, as cited in O'Brien, 2001, p. 2). Participants in this study were the poorest readers in this high school.

Students who were labeled "at-risk" were successful as they used multiliteracies (new media) to express their ideas. While these adolescents had been "positioned as failures, [and] as 'special' . . . [they could] be viewed as people using creative approaches to address the complexity of their world and are solving problems that they pose through a visual medium" (p. 3). These adolescents are competent, but traditional approaches to literacy may indicate that they are incompetent, struggling, or "at-risk."

The purpose of O'Brien's (2003) study was to show how using media redefines competence. Specific results of this study were based on three students who read below grade level and were uninterested in traditional literacy tasks. However, they successfully completed projects about a topic that interested them using popular media. Participants wrote narratives, mimicked comic book genres, became proficient with various technology tools, scanned photos, created a website, captured video clips, and created a video montage. One result of this study was that popular media helped students who were labeled "at-risk" feel successful as they completed literacy tasks. General results of this study are that educators should be grounded in print literacy in order for new literacies to be used effectively. One text should not replace the other. Third, digital literacy can enhance print literacy.

These studies show that technology is beneficial for underachieving students. However, more research is needed to analyze how seventh graders use the Internet as part of their classroom experience to answer a question as they locate, organize, and present information.

Uses of Technology in Education

Several studies show how using technology in educational settings is beneficial for adolescents. However, using the Internet in schools is open for debate because adolescents do not have adequate research skills, the expertise to find pertinent information, or the experience to check the reliability of the sites they search (Baildon & Baildon, 2008). However, despite these challenges, using the Internet as a text in secondary schools is motivating and can enhance students' learning (O'Brien & Scharber, 2008).

While interdisciplinary projects may provide structure that meets adolescents' needs, teachers should not use the Internet in their classrooms just because it is technology (Moje, 2000; Sutherland-Smith, 2002). These researchers suggest that teachers need to critically evaluate how

they are using technology in their classrooms to make it effective and applicable for adolescents. Internet inquiry projects, either open-ended or an Internet workshop, are additional effective methods for integrating the Internet in classrooms.

Internet Workshop

One way to assist adolescents with Internet inquiry is to have adolescents participate in an Internet workshop. Leu and Kinzer (2003) state that an Internet workshop is teacher-directed and based on a particular unit or concept of study. Components of an Internet workshop include the teacher locating sites related to a unit, developing an activity related to the goals of the unit, assigning the activity, and giving students time to share what they found studies that align with the components of an Internet workshop.

Agosto (2002) conducted a study to offer a theoretical model of the criteria adolescents use to evaluate websites. This study is an example of an Internet workshop because she selected the websites participants used to research. Her qualitative study looked at how personal preferences, object enhancement characteristics, human processing constraints, and contextual constraints contribute to how eleven 14 to 16 year old girls in ninth and tenth grades evaluated websites.

To gather data for her question, Agosto used questionnaires, transcriptions of two group interviews, and website evaluation and surfing session logs (participants' notes). Results of this study show that the participants evaluated websites in nine areas. First, participants assumed that sites with a lot of information were more accurate than ones with less. Second, they avoided sites that were created by students because they doubted the depth of the information. Third, they visited a site based on front page of site. Fourth, they agreed that more graphics and multimedia content made a better website. Fifth, they liked being able to interact with the website and games

were especially desirable. Sixth, they preferred to stay on a site moving between pages rather than following links on the site. Seventh, participants discovered that pages with large amounts of text to scroll through made it harder to read and understand. Pages with text and pictures were easier to read. Eighth, they valued the Web over other informational sources because they could access it from home and school, thus reducing the physical energy required to locate information. Ninth, participants were frustrated when their computers were too slow to download videos, music components, or pages with graphics on them.

In a study that capitalizes on how students evaluate websites using interviews, Damico and Baildon (2007) conducted a study to examine effective ways to guide four (three above average and one average) eighth graders as they looked at websites in an inquiry-based social studies curriculum. Before this study began, participants completed a project about Mexico and migration. Researchers preselected sites for participants to view that they had not used previously as they completed the project, thus making it an example of an Internet workshop.

Results of this study indicate that students may not have sufficient background knowledge to determine if a source is credible or not. For example, if students have never heard of an historical figure, they may not know if the information the author wrote on the site is correct. Next, participants identified the author, publication date, and key information. They knew if new information was being offered. Lastly, participants recognized that the site had information on it that was unfamiliar.

Participants in Thakkar et al.'s (2001) study did not evaluate websites, but they used a project known as Chickscope to study an embryo and access the laboratory on the website. Students in kindergarten through twelfth grade participated in this project. For the two years the Chickscope project was implemented, 42 teachers from 17 schools, 150 preservice teachers, and

2,000 students were involved. Teachers who participated in the Chickscope Project created a website showing activities where students predicted, collected data, recorded observations through writing and drawing, and hatched eggs. Teachers were selected to participate in the project based on being interested, using plans to make Chickscope part of their curriculum, and having access to the Internet.

General findings from this study indicate that, first, participants learned how to collect and analyze data, ask questions, and communicate their findings. Second, they learned new vocabulary, and how to read nonfiction and fictional texts. Their drawings and access to images are examples of visual literacy. The entire project is an example of multimedia literacy because it encompassed many facets of literacy.

Studies showing how participants evaluate preselected sites is becoming evident, but more studies that analyze what students do as they access websites on their own to complete a project may assist educators in analyzing the literacies students use online.

Open-ended Projects

On the other hand, several studies have been done where the parameters of the project were more open. Open-ended projects are another way to help students become critical consumers of text and read on the Internet. Land (2000) defines open-ended learning environments (OELEs) as “using the capabilities of technology to provide students with opportunities to engage in authentic problem solving; generate, test, and revise hypotheses; explore and manipulate concepts; and reflect on what they know” (p. 61). The technology component “support[s] thinking-intensive interactions with limited external direction” (p. 62). In other words, technology is used to support students’ thinking while they direct their own learning. As students are presented with authentic problems to solve or opportunities to research

interesting topics, they have to use several strategies to locate then evaluate information on the sites they read and present their findings. Examples of four studies that are open-ended follow.

Baildon and Baildon (2008) investigated what happened when 21 nine- and ten-year olds (10 boys and 11 girls) in fourth grade were taught strategies to research independently and use a resource guide while looking for information about rain forests. They used other sources besides the Internet to find information. Participants in this study were at an international school in Singapore. They spoke English fluently and comprehended texts on a third to sixth grade level.

Researchers used several data sources to gather information about how students started to internalize the strategies. Initially, researchers gave participants a Likert scale for students to assess their independence in doing research. Participants also completed this scale at the end of the project. One researcher kept a teacher reflection journal. Observations and anecdotal records were also used as data sources.

This study is an example of an open-ended project because participants searched for information about rain forests using sources that fit the criteria the researchers instructed them to follow. Participants selected their own sites to research. Researchers guided students through activities to assist them in developing criteria for checking the readability, trustworthiness, and usefulness of resources they selected to find information about rain forests. Students then used the research resource guide sheet to determine if they should continue looking at the source or not. Guiding questions from the resource guide include “Can I understand the information on my own, or with a little help? Is the information current? Does this resource have what I am looking for?” (p. 643).

Results of this study show that a research resource guide aided students in being more analytical about the sources they selected. Specifically, the guide focused their questions on

readability, trustworthiness, and usefulness of the source.

Related to the previous study in terms of generating questions, Krajcik, Blumenfeld, Marx, Bass, and Fredricks (1998) conducted a study to describe what eight 13-year olds (four boys and four girls) did during their first experiences with inquiry learning and where they had difficulties. Participants were in the lower middle range of science achievement. Participants worked in groups, asked their own subquestions, collected data, and reported it as they attempted to answer the question “Where does all our garbage go?” Participants generated their own subquestions making this an example of an open-ended project. This study indicates that seventh graders’ difficulties with inquiry in science are becoming evident. For example, participants had a hard time when their plans necessitated looking at several observations or complex data procedures.

Also related to participants choosing a topic, Eagleton et al. (2003) designed a project for eighth graders about heroes to guide them through the beginning stages of inquiry—selecting a topic, asking questions, and selecting key words. Their target population was students in mainstream classes who have learning disabilities.

This project is an example of an open-ended project because participants selected a hero to research. During this six-week study, researchers gave students pretests, taught lessons about selecting keywords, narrowing the topic, searching, and presenting information. This study gives a detailed outline of an Internet inquiry project rather than analyzing specific data. However, researchers used student conferences and pretests to determine the next lesson of instruction in the unit.

The results of this study show that students were motivated to complete the project because they were able to choose their own topic. Also, their research skills were fine tuned as they researched a hero of their choice.

Summaries of open-ended studies indicate that it is beneficial to guide students as they generate questions and evaluate websites. More information is needed about which strategies marginalized adolescents use as they complete an Internet inquiry project with less guidance from a researcher. Analyzing this may give educators insight into how students naturally search for information online.

Chapter 3: Methodology

Participants in this study were involved in a four-week Internet inquiry project during their reading class taught by their special education teacher, who was also the researcher. The project included three major phases: selecting a topic, locating information, and organizing the presentation.

To address the strategies two seventh-grade special education students use to complete an Internet inquiry project about survival, this chapter will describe the following: the context for the study, a description of the participants, the project design, the data sources, and the Internet inquiry procedures. This chapter concludes with a section about data collection and analysis, and data coding.

Context for the Study

This study took place in a middle school in a suburban middle class community in a western state. The middle school serves seventh through ninth graders. This school has a diverse population with English Language Learners, students from many countries (e.g., Mexico, Burma, China, Israel), those who are in resource classes, students enrolled in gifted and talented classes, those who are in an emotionally disturbed (ED) unit, or in an intellectually disabled (ID) unit, as well as the students in regular education classes. Approximately 10% of this school's population is served in a special education setting. The total enrollment in this school is about 1800 students. Within this school's population, 28% of the students qualify for free or reduced lunch. The major ethnicity of the students in this school is Caucasian.

School Description

On a regular Wednesday, Thursday, and Friday schedule, each class period is 83 minutes long for students in this school. On Mondays, classes are shortened to 70 minutes to

accommodate professional development for teachers in the afternoon. Tuesday classes are shortened for an advisory period to allow students who have good grades to attend enrichment activities. This shortened day gives students who need to make up tests or assignments time to complete them.

In terms of class structure, resource classes in this school are a class in the students' schedule. Students are not pulled out of one class to meet in another room during another class's time. Adolescents who are in special education classes are assigned to an English, math, or reading class that has fewer students than a regular education class. The students who are in a special education class meet in a classroom similar to any other in the building.

The special education classes in this school are designed to address the needs of the students using specialized instruction. The instructional pacing and delivery of information in resource classes is different from regular education classes. It is often more direct and delivered at a slower rate.

Class Descriptions

By law, individual students' needs must be met in the least restrictive environment—in the setting that is the least confining for him or her. A brief explanation of each setting in this school follows to explain how the classroom environment where this study took place differs from the other classes.

Regular education classes. For most of the students who have a learning disability, a regular education class is the least restrictive environment because most of their academic and social needs can be addressed in ways just like their same-age peers. Regular education classes have between 30 and 40 students in each class. Elective classes, such as art, physical education, choir, band, and orchestra, have more students than the grade level core classes—English, math,

and science. A student who has severe learning disabilities or behaviors can still access general education classes. Sometimes these students are accompanied by an adult aid or a peer tutor to help the student access the curriculum.

Cotaught classes. The next more restrictive environment is a cotaught class with two teachers—a special education teacher and a regular education teacher—who instruct and assist all students in the classroom. At this school, co-taught classes are offered in prealgebra, algebra, and each grade level English class. In a cotaught class, the class size is between 30 and 35 students. The needs of the students are addressed in a timely manner because two teachers are in the classroom.

Resource classes. A resource class is the most restrictive environment for students with mild or moderate learning disabilities because they need more intensive instruction in the area related to their learning disability. An example of a class in this setting is a reading class for students in special education. Students in this class are three to five years behind their same-age peers in basic reading or reading comprehension skills. The average class size is between 12 and 16 students. The number of students in the classes varies each year depending on the needs of the incoming population.

During a regular 83-minute period in the resource reading class, where the study took place, students had time to read on their own, they listened to the teacher read aloud, and completed part of the commercial REWARDS program (Florida Center for Reading Research, 2006) the school district has adopted. The REWARDS program shows older students how to systematically break long words into syllables. Students also spend time using 6-Minute Fluency (Adams & Brown, 2006), a program to help students increase their oral fluency rate. This study took place in a resource setting.

Participants

The participants in this study were two students who read on different levels and were enrolled in two different sections of a seventh grade special education reading class in a resource setting. Students selected a topic, located information online, organized a presentation, participated in interviews, wrote in a journal, completed assignments, and participated in unplanned collaboration with other students as they researched an aspect of survival.

Bobby

The first participant in this study was Bobby (participant-selected pseudonym), a 12-year old male in seventh grade whose fluency, decoding and comprehension skills were below a fourth grade level. I selected Bobby to be a participant in this study because his reading skills were lower than those of other students in the class. Despite this, he came to class every day willing to work and improve his skills. Bobby had a lot of questions throughout the year when he was unsure about how to complete work in the resource reading and English classes.

Lily

The second participant in this study was Lily (participant-selected pseudonym), a 12-year old female in seventh grade who read close to a seventh grade level. I chose Lily to be a participant in this study because her reading skills were higher than those of most students in the resource reading class. She had become a voracious reader the summer before her seventh grade year. Lily was in the special education reading class to gain the skills necessary to improve her reading, but because she started loving reading on her own, the resource reading class was a review for her. At the end of her seventh grade year, Lily no longer qualified for special education services, and she was declassified. This means she could register for a full schedule of regular education classes as an eighth grader. Lily was also in two of my classes—one was a

cotaught section of English where I was the special education teacher. Lily kept up with her peers in this class and rarely asked for assistance.

Teacher/Researcher Qualifications

I was also a participant in the study because I took field notes as the participants searched the Internet and conducted interviews with them. I am qualified to take field notes because I have been observing adolescents with disabilities for seven years. During each year of my teaching career, I have taught at least one special education class. I am also certified to teach regular education English classes, and I have been able to compare the students in special education with those who are in regular education classes.

I have observed the characteristics good and poor readers have because I have worked with hundreds of students. From informal observations over the years, I know good readers relished the silent reading time they were given in class. These good readers generally kept one book for an extended period and occasionally asked to go to the library. Conversely, poor readers seldom read during silent reading time. They asked to go to the library frequently.

Potential biases associated with this study include my knowledge of the participants' reading levels that could influence what I record in my field notes. A student on a lower reading level may ask more questions and need more help in general compared to a student who is reading on a higher level.

I took field notes on each participant for approximately 15 to 20 minutes during seven days as they used the Internet and organized their PowerPoint presentations. To accommodate the rest of the class while I took field notes, a paraeducator came into the class to assist other students.

Design

The design of this study is a case study because I analyzed the experiences of two students. Merriam (as cited in Barone, 2004) states that a case study has four components: a singular focus, a rich description, an enrichment of the reader's understanding, and a data-driven nature. First, the focus is on a particular situation, program, event, phenomenon or person. For this study, the focus was two participants using computers to research and present information about a topic related to survival. The second characteristic is the rich description of the object being studied. The rich description came from field notes, interviews, screen capture recordings, and journals that were analyzed to show strategies that participants used as they researched and organized information. Next, the study enriches a reader's understanding. A reader's understanding of how marginalized readers use computers as a tool increases from this study. Lastly, the data that drove this study are based on the information from the four data sources.

Data Sources and Collection

Students selected a topic, located information online, organized a presentation, participated in interviews, wrote in a journal, completed assignments, and participated in unplanned collaboration with other students as they researched an aspect of survival.

Once students gave assent and parents consented to let their student participate in the study (see Appendix A), data collection began. To analyze the strategies Bobby and Lily employed, four data sources were used. First, participants wrote general information about each day's searches on notebook paper. Second, a monitoring program (Camtasia Studio, 2009) was used to record participants' computer activities. Third, I recorded field notes while each participant used the computer to locate information or organize a PowerPoint presentation. Fourth, I conducted interviews with Bobby and Lily to learn what they were thinking while they

used the computers. A more detailed explanation of each data source and how I gathered data from each source follows.

Student Journals

Students recorded in a journal what they were thinking, frustrations they experienced, or other insights they had as they searched the Internet to find answers to their questions. In this study, the participants' journals were free and candid, rather than being guided using a form or following specific requirements. Students responded on a blank piece of paper to my verbal prompts by writing their likes, dislikes, frustrations, or interests from that day's search. Students were told to record their frustrations, insights, challenges, and questions. I showed the students an example of a journal response before they started working on the project so they had some guidance as they completed their responses.

In terms of collecting data, most journal entries were brief. They completed journals in all three phases and were given time at the end of most days to respond to their searches.

Monitoring Program

Camtasia Studio (2009) software was used to capture and record Bobby's and Lily's search actions each time they searched for information on the Internet and as they organized their presentations. I also used segments of the recordings during interviews to probe participants' responses about what they were thinking and doing while online. Camtasia Studio (2009) recorded exactly what the participants viewed on the computer screen, including the search terms they used, websites they visited, mouse clicks they made, words they typed, the length of time they took on each page, and ways they organized their presentations. Additionally, the software could record the participants' voices. Bobby and Lily had an opportunity to experiment with Camtasia Studio (2009) software individually before their search sessions were recorded. They

knew the software would be running each day as they strategized about locating and presenting their information.

During the interviews, I showed the participants segments from their searches and asked them questions about strategies they used based on that segment. The entire class saw how Camtasia Studio (2009) worked before the participants' search sessions were recorded.

When the project was complete, I viewed each recording and transcribed what each participant did during the sessions. These transcriptions were essential in determining the strategies each participant used as they completed the Internet inquiry project.

Researcher Field Notes

Since both participants were enrolled in different sections, I observed them during different class periods. I sat or stood behind the participants' computer screens while I hand-recorded field notes. At a later date, I typed the notes to prepare for data analysis. Observations about each participant's search included questions they asked, complaints they made about their work, frustrations they voiced, general observations they made about their work, and other items that appeared noteworthy (e.g., participants collaborating with other students, students becoming frustrated, or asking questions). I took field notes daily for a period of seven days for at least 15 minutes at the beginning of each search session. A paraeducator assisted the other students in the classroom with their projects while I took field notes on each participant. My goal in collecting data with field notes was to record as much information as possible about the strategies each participant used.

Interviews

I interviewed the each participant individually four times about what they thought as they searched the Internet after days 4, 8, 15, and after they presented their project to their peers and

parents. I selected this pattern to study what the participants were thinking as they developed their research question, how they located information, how they organized their presentation and what they thought about the inquiry project overall. I included two days of searching in each interview to avoid taking too much time away from the participants' research. Interviewing participants more frequently may have caused their responses to be less detailed. I established this pattern because students who are in resource classes like a classroom routine, but they do not like doing the same task repeatedly.

The eight interviews were conducted with segments from their searches using the Camtasia Studio (2009) software. The student journals and field notes did not yield information that was as rich as the online recordings. Student journals and field notes were not used consistently in the interviews. Each participant viewed clips from his or her previous two days of searching. The interviews were audio recorded and transcribed.

In preparation for the interviews, I viewed each Camtasia recording to find segments where I wanted Bobby and Lily to explain their thinking in more detail. During the interviews, I showed Bobby and Lily the segments from their individual search sessions and asked them questions to analyze the strategies they used. The segments ranged in length from a few seconds to a couple of minutes. As I selected clips for the interviews, I recorded questions to be used as an interview guide. Sometimes the questions pertained to both participants (see Appendix C) other questions were unique to Bobby's (see Appendix D) or Lily's (see Appendix E) search. The participants' specific questions related to recorded events each one demonstrated as he or she selected a topic, located information, or created a PowerPoint presentation.

Internet Inquiry Procedures

The procedures for using the data from the four sources in this Internet inquiry study were divided into the phases of topic selection, locating information, and organizing the presentation. A brief description of each phase follows.

Topic Selection

The project began by engaging students over a period of eight days in brainstorming topics, reading children's books, viewing a documentary, analyzing websites, and giving students time to explore websites related to the general topic of survival. Students were responsible for choosing a topic about survival by the end of the eighth day. Other activities related to the reading curriculum were completed during this time as well. The participants spent approximately 25 to 40 minutes of each 83-minute period focused on topic selection.

Locating Information

During the ten days of the locating information phase, the participants spent 26 to 50 minutes each class period searching for information about their topic. Participants' questions were answered if they were unsure where to search online. Occasionally I redirected them to different sites. All of the students in both classes were monitored to make sure they were making progress on the project. I took field notes about each participant in this phase. The students were expected to be online searching appropriate websites for information related to their topic.

Presenting Information

During this phase that lasted approximately five days, students were free to create their own presentations. At the beginning of the project, I mentioned several mediums for presenting information. Bobby and Lily chose to do PowerPoint presentations. I explained that their PowerPoint presentations had to have at least five slides with both pictures and explanations/text

on each slide. I did not give specific guidelines about how to present their information so individual creativity was not stifled. Bobby and Lily knew that they would be presenting their projects to the members of the class and possibly their parents, so appearance was a consideration/expectation for this assignment. Some students were engaged in locating information and working on their presentations simultaneously the last two or three days of this phase.

My role in this phase was that of an observer, although answering occasional questions about the PowerPoint software became part of this phase. Most of the time, students relied on each other for assistance in answering their queries about PowerPoint. My role as the teacher changed (Leu, et al., 2004; Sutherland-Smith, 2002; Windschitl, 1998) dramatically during this phase. I was not able to answer some of the questions students had about PowerPoint, but the students were able to help each other.

Data Analysis

This section discusses how the four data sources were analyzed. It also outlines how each a unit of analysis was formulated for the data sources—student journals, monitoring program, researcher field notes, and interviews.

Units of Analysis

The unit of analysis for coding in this study was an *intact event* as judged by the researcher. An intact event was defined as a complete strategy. When the participant moved to the next step in locating information or presenting his or her information, a new unit of analysis was evident.

Student journals. The unit of analysis for journal entries was a complete entry for a single day because the responses were always brief and usually included only one strategy. If

two strategies were mentioned, the daily entry was coded into more than one category. No journal entry included more than two strategies.

Monitoring program. The unit of analysis was each strategy the participants used. For example, each of the following examples would be considered a unit of analysis: clicking back, clicking on a link, going to a website, immediately getting off a website, reading on a website, asking me or a peer for help, or selecting a font for the PowerPoint presentation. These recordings were used as a separate data source to analyze the participants' strategy use.

Researcher field notes. The unit of analysis was each observed strategy participants used. Examples include asking a question, opening a program, collaborating with a peer, selecting a search engine, or choosing search terms was a unit of analysis.

Interviews. I conducted interviews using segments of the recordings from Camtasia Studio (2009) to generate questions about the strategies students used. The unit of analysis for the interviews consisted of my question and a participant's response to that question. Sometimes the initial question required me to ask a follow-up question. The entire sequence of the initial question, the initial response, follow-up question, and follow-up response constituted a unit of analysis. For example, during the first interview, I asked Bobby why he used Firefox. He responded, "It's like the most trusting site that my parents like." The follow-up question to this was, "Why do your parents prefer that you use Firefox instead of Explorer?" His response was, "Yeah. My mom didn't have it on her new computer, so my brother had a friend who downloaded it." This entire segment of the interview was the unit of analysis because all the questions and answers related to the same topic of discussion, even though Bobby's responses did not directly relate to my questions.

Coding the Data

I coded responses from student journals, my field notes, Camtasia Studio (2009) recordings, and interviews. Initial data collection resulted in a large amount information that had to be reduced. The first review of the data resulted in an unmanageable number of categories. In a second review of the data, the categories were reduced to a smaller number using defined categories from the Teaching Internet Comprehension to Adolescent (TICA) project (Coiro, Malloy, & Rogers, 2006). A data reduction chart was made showing the number of events that occurred in each of the established categories (Coiro et al., 2006) for each participant. The phases and subcategories for each phase are in Table 1. To assess inter-rater reliability, a colleague and I coded a random 10% sample of data. These results were compared and agreement was achieved in 88% of the cases.

Once the data were coded, the total number of recorded events in each subcategory was calculated. The percentage of the whole project that participants spent in each subcategory was calculated. The percent the participants spent in each phase of the project based on the whole was also determined. These percentages were used to write two cases based the recorded strategies in each subcategory and to compare and contrast the strategies participants used as they completed this Internet inquiry project about a self-selected topic related to survival.

Limitations

Two of the data sources—student journal entries and researcher field notes—represent the perspectives of those who wrote them. These data sources, combined with recordings of actual Internet searches, were essential in answering the research question even though only one perspective is represented.

The study involved only one researcher, the classroom teacher of the two selected student participants. Another researcher's observations might differ from mine in this study, but my perspective is valuable due to the teacher-student relationship I established with these students. Because of these relationships, my insights may be more valuable than an outside observer's. Data and conclusions were examined by another individual to check that procedures were followed appropriately.

Examining a smaller sample allowed me to identify specific challenges participants had. For example, the participants were able to view searches that had been recorded during interviews. This type of analysis and recall would have been impossible if a larger sample had been used.

Table 1

Modified and Defined Taxonomy of Internet Reading Comprehension Skills and Strategies

Topic selection	Decisions and strategies for selecting a topic
Question or problem	Identifying a question or defining a problem
Shift in question, problem, or topic	Changing his or her original question or problem
Locating information	Strategies for searching on the Internet
Searching plans	Making plans for searching
Using a search engine	Using a search engine to locate information
Determining key words	Entering key word(s) to search in a search engine
Reading the results of a search	Reading and selecting sites on a search results page
Reading a webpage	Reading a single webpage to locate information
Evaluating information	Evaluating information in a variety of ways
Reliability check	Verifying information for reliability
Reading print texts	Using print sources to find information
Taking notes	Taking notes electronically, paper and pencil
Presenting information	Decisions and strategies for presenting information
Audience	Monitoring information for audience
Formatting	Focusing on the elements of his or her presentation
Technical skill	Demonstrating specific computer skills
Strategies used throughout the project	Decisions or strategies students used in all phases
Collaborates with peers	Working with other students to as a strategy
Collaborates with teacher	Working with the teacher/researcher to strategize
Frustration	Inability to make decisions to progress in the project

Chapter 4: Results

This chapter presents two cases about participants' strategy use as they selected a topic, located information, and presented information using Internet and computer literacies. An explanation about what they did within each subcategory of the phases is also given. Following the cases is a section comparing the participants' strategy use during of each phase of the project.

Profile of Bobby

This section begins with a description of who Bobby is as a student along with some information about who he is outside of school. The remainder of this section discusses the strategies Bobby used as he selected a topic, located information online, and organized his presentation.

Background Information

Bobby is a seventh grade boy who does not read or comprehend at grade level. His most recent testing indicates his processing speed and IQ are below average. His standard scores in reading comprehension and basic reading skills were 86. A score between 90 and 100 is average. I selected Bobby to be a participant in the study because his reading skills were lower than most students in the class. His overall academic skills were low as well. Yet, Bobby rarely complained but had every excuse to do so; school was difficult for him. He tried to make his peers feel comfortable. Bobby is kindhearted.

In our first interview, he told me that he had more than one computer at home and he used it when he was not grounded. He used his computer to “play computer games . . . [and] used the Internet for playing and for searching stuff online.” Bobby could not remember what he liked to search for, but as I probed further and asked him about his most recent search, he

explained that recently he searched something about JD Power in his marketing class. Bobby liked everything about computers.

At the time of the interview, Bobby was reading *Fablehaven 4: Secret of the Dragon Sanctuary* (Mull, 2009). He was on chapter seven and liked it. (His sixth grade teacher read books one and two out loud to his class last year.) Bobby read the third book in the series on his own. He knew the fifth one in the series was coming out that week. Bobby wanted to go with his dad to buy it because his dad also liked the series. I asked him if he was reading anything else. He had just finished reading the third book in the *Diary of a Wimpy Kid* series (Kinney, 2009). He said he was excited for the movie but explained that his mom thought it looked dumb, so she did not want him to see it. He said he would wait for it to come out on DVD.

Bobby said his favorite class was math because “you get to learn stuff that you need to learn later in life.” He explained that he did not like the bullies at the school, but because his mom worked at the school he would say, “if you bully me again, I will tell my mom.”

Bobby was a hard worker in class, asked questions when he needed help, and persevered even though school was not easy for him. I chose Bobby as a participant to analyze how a student who struggles with traditional texts accessed digital ones. The following section details what he did in each phase of the project—selecting a topic, locating information, and presenting information about bear attacks—his interpretation of survival.

Selecting a Topic

The strategies Bobby used when selecting a topic related to survival include choosing a question or problem, and shifting his question, problem, or topic. Bobby thought about doing his project on cancer momentarily. In the end, he decided to research bear attacks. Bobby spent 1% of the allotted time for the project in the selecting a topic phase.

Question or problem. Initially, Bobby selected his topic about bear attacks. On a brainstorm page, Bobby listed forest, survival instincts, camping, hiking, fireplace, and ghost stories as subtopics of bear attacks. Bobby's reason for selecting bear attacks as his topic was "I don't think they are cool. It's just that they're not funny to joke around until you get attacked by one."

Shift in question, problem, or topic. During the first interview, Bobby explained that he was going to search "something entirely different now that I know . . . it's hard to survive cancer because my aunt had cancer." As he drifted from one search question to another, he may have been unsure about how to begin searching any topic online (Coiro & Dobler, 2007). I directed him to continue searching about bear attacks because cancer was too broad for the scope of this project.

Locating Information

Bobby employed several strategies as he searched for information, including using a search engine, determining key words for searching, reading results, reading a webpage, evaluating information, checking the reliability of sites, reading print texts, and taking notes. Bobby spent 57% of the total time allotted for the project in the locating information phase. Bobby used Mozilla Firefox during each session to locate information.

Planning the search. At the beginning of this phase, the only recorded plan Bobby made plan for searching was choosing a topic. He completed a student subject knowledge bubble map (Eagleton et al., 2003) to assist him in thinking about a possible topic.

Using a search engine. Once Bobby decided that he was going to search for information about bear attacks, he used a search engine to locate information. He went to Google.com each day to begin his searches.

Determining key words. As Bobby used Google.com to initiate his searches for information about bear attacks, he had to decide which key words he would use to locate information. In his first search recorded using the Camtasia Studio (2009) software, Bobby used *bear attacks* as his key words. Figure 1 is a screen capture of the beginning of this search sequence. Bobby clicked on the fourth site—*survive a bear attack*—from the search results page these key words yielded. While he was on this site, he clicked on a link at the bottom labeled *Back to Hunting Rifles* (see Figure 2) then he clicked back to return to the *how to survive a bear attack* site. On both the bear attack or hunting rifles site, he found the name Jack L. McSherry. Bobby used *Jack L. McSherry* as his key words to begin another search. He selected the first site titled *Jack L. McSherry, III, Arctic Explorer* on his search results page. After selecting this site, he clicked on several links at the bottom of the site and looked at a link's page briefly.

During his second recorded session, Bobby decided that *how to cancer* would be his key words. He scrolled through about half of search results page. Bobby clicked on site three titled *about cancer*, site two titled *how to find resources in your own community—national cancer*, then clicked on site one titled *questions and answers about cigarette smoking and cancer*. He continued to look through the results page. He clicked on the 7th, 8th, and 10th sites listed on the search results page to get information about how to survive cancer.

After this, I directed Bobby back to searching for information on how to survive a bear attack. Bobby decided to use *how to survive* and used the pull-down menu to select *how to survive a bear attack* as his key words for this search. When the results came up, Bobby clicked on site 5 titled *how to survive a bear attack*. He returned to the search results page and clicked on site 4 titled *how to survive an encounter with a bear*. Following this, Bobby clicked on site 7 titled *bear attack survival guide the art of manliness*. After clicking on site 7, Bobby continued

clicking on sites 8, 9, 10, and 1, in that order, to find information about how to survive a bear attack. Bobby changed his key words to *what is bear spray* after using suggestions from the pull-down menu. He scrolled through his results and clicked on sites 5, 3, and 8, in that order.

During his third recorded session, Bobby needed some direction because he did not know what to do next. He knew his original question was how to survive a bear attack. I asked him what other information he needed to answer that question. Bobby decided that finding out where bears are located would help him begin to answer his question. Bobby went to Google.com and typed *where bears are* then selected *where bears are located* from the pull-down menu. He clicked on sites 4 and 5. While he was on site 5, he read the information out loud to himself. He changed his search terms to *how to survive a polar bear attack* and selected this phrase from the pull-down menu. He clicked on sites 7, 10, 9, 11, 12, 13, 14, 13, 18, 20, 29 and 33; he viewed site 13 twice.

Using the same key words, *how to survive a bear attack*, but clicking on a link at the bottom of the Google.com page, Bobby continued his search. He clicked on site 2, then site 1, which contained graphic pictures of a man who had been attacked by a bear. Bobby clicked on sites 3, 4, 15, 20, 22, 7, 3, 31, 38, 47, 52, 56, 61, and 70 on the search results page. As he visited these sites, he looked at them briefly and almost immediately clicked *back*. Bobby continued looking at the search results page as a result of clicking on the link. He went to page 8 and further in his results as he clicked on sites 77, 86, 102, and 115.

The next day's search began with Bobby deciding to use *how to survive a brown bear attack* as his search terms. Scrolling through the results, Bobby clicked on sites 5, 1, 3, 7, 10, 9, 8, 14, 15, 16, 17, 22, 29, 30, and 8 more past site 30. Again, Bobby clicked on each site, and immediately clicked *back*. He did not read much, if anything, on the sites he visited.

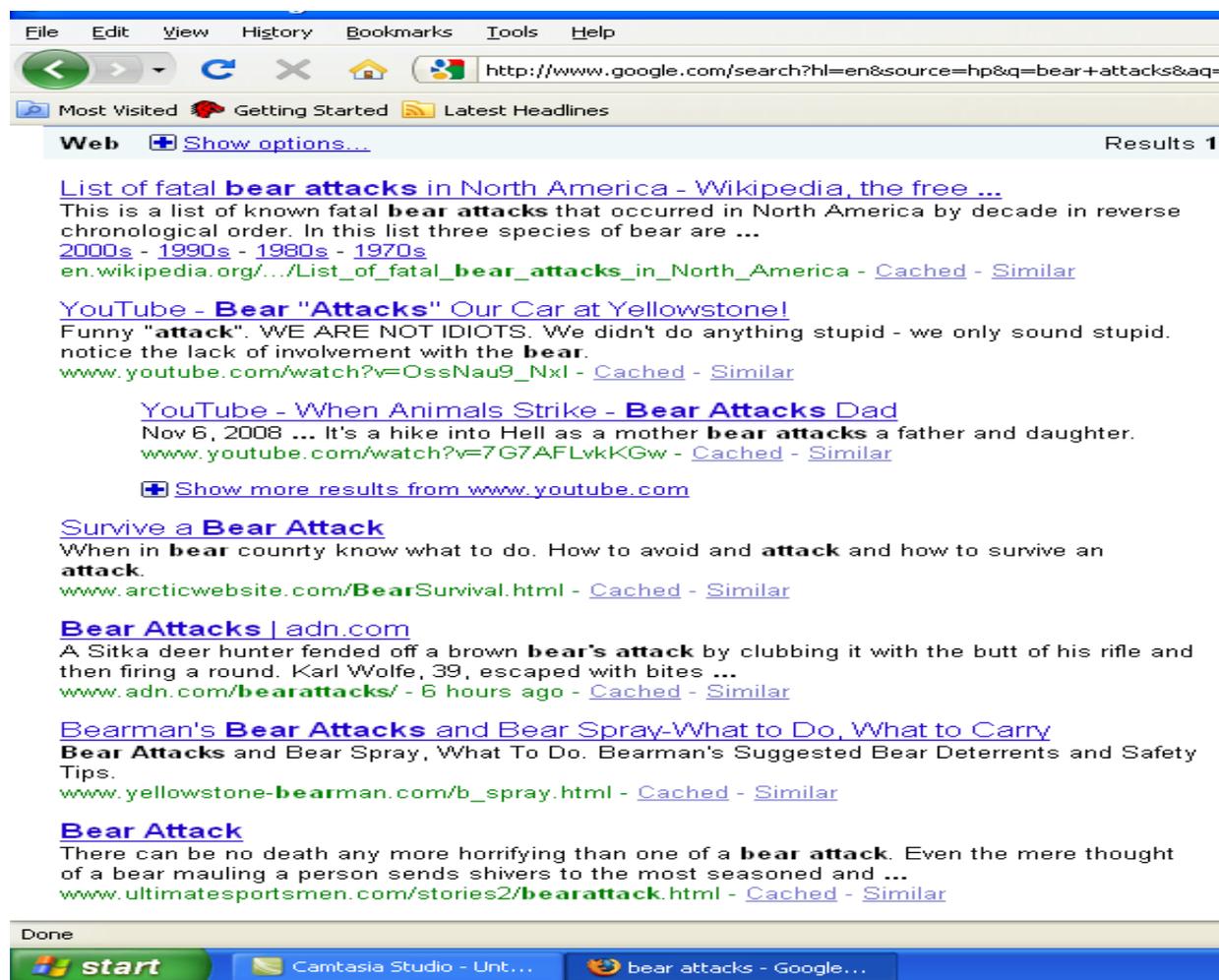


Figure 1. Bobby's Screen Capture Using Bear Attacks as his Key Words



Figure 2. Screen Capture of Bobby Clicking on the Link Back to Hunting Rifles

For the last two searches, Bobby decided which pictures to use in his PowerPoint. Bobby went to Google images and typed *grizzly* then selected *grizzly bear* from the pull-down menu. Bobby was unable to come up with a title for a slide, so he asked me what to do. I told Bobby to look at sites that had facts about bears on them—ones he had viewed in a previous day's search. Bobby used the key words *Alaska bear view*, then selected *Alaska bear viewing* from the pull-down menu in an attempt to find the site he had visited in a previous day's search. From this search results page, he clicked sites 2, 1, 7, 8, 12, 13, 14, 17, 15, 18, 19, and 4 sites higher than 19. I redirected Bobby's search because he was on the second page of his search results. He went back to Google and decided to use *grizzly bear* as his key words.

The last day's search began with Bobby going to Google.com and deciding to use *grizzly bear* from the pull-down menu as his key words to find images for his PowerPoint. He clicked on sites 6, 7, 9, 10, 18, 22, 35, 40, and 50 to find pictures. Bobby decided to select at least one picture from these results to place in his PowerPoint.

Reading the results of a search. Reading results involves deciding which sites to view from a search results page. As Bobby decided which sites to read from his search results page, he employed various strategies. He selected key words, clicked on several sites and decided whether or not to stay on the site, and clicked back. Bobby visited several sites to locate information for his project. Table 2 shows the domains for the sites he visited and the percentage of each domain compared to the total. Bobby visited 147 sites to locate information for his project, and 119 or 81% of them ended in the .com domain. The next closest were the sites that ended in the .org domain at 7%.

Table 2

Frequency and Percentage of the URL Domains Bobby Visited

	F	%
.co.uk	3	2%
.com	119	81%
.edu	0	0%
.gov	2	1%
.htm	2	1%
.info	1	< 1%
.k12.hi.us	1	< 1%
.mil	1	<1%
.muse.mu	1	< 1%
.net	6	4%
.org	11	7%
Total	147	100%

Bobby's pattern for locating information entailed going to Google.com, typing his key words, clicking on sites on the search results page, going to the site, then clicking back to return to a previous page or a search results page. During his first Camtasia Studio (2009) recorded search, Bobby clicked on several links from one particular site. Why he clicked on most of these links is unclear. In the interview, when he was asked why he clicked on so many different things he responded, "I don't know." I asked a follow-up question—"What were you trying to find?" which resulted in Bobby stating, "More information about it." From a second probing question, "About what?" Bobby stated, "The bears."

Reading a webpage. Throughout the project, Bobby did not spend a lot of time reading a webpage once he opened it. For example, during his first recorded session, he stayed on each site for six minutes or longer. He spent from six minutes and nineteen seconds to eight minutes and twenty-one seconds (6:19–8:21) on the four sites during this session (i.e. 7:12, 7:28, 8:21, and

6:19). This was rare because he often opened a webpage then immediately clicked back once he opened it.

Similarly, during his second recorded session, Bobby spent approximately 9:02 on a site reading about bear spray. After this, he spent approximately 2:02 on the bottom of this same page, then clicked on a link titled *be bear aware month* on the bottom of the website. He clicked the play button on a little movie screen, but nothing appeared in that screen. Bobby scrolled all the way to the bottom of the webpage. On the bottom of the screen, his mouse moved over a few links—*Awards, Photo Gallery, In the News, Center for Wildlife*, but he did not click on any of them. He went to the upper left of the webpage, but he did not click on anything. He went back to the bottom of the webpage and continued moving his mouse over additional links—*Reading Room, Publications, Viewing/Photographing*, but he did not click on any of them.

Evaluating information. Bobby had to utilize strategies to decide if the information on the sites he visited would answer his question. On at least one occasion he said, “I’m not trusting this site.” Another strategy Bobby used as he evaluated information was finding valuable information on a site. Bobby went to a site that listed details about a variety of bears—weight, where they live, and general characteristics about each one. Bobby was fascinated with the differences in bears. He made a comment about the weight of one species and stated he did not know that there was a sloth bear.

Checking reliability. Checking for reliability on sites is closely aligned with evaluating information. Bobby checked the reliability of a site as he attempted to find the author on the sites he visited. I instructed Bobby to get information from sites that were written by authors who were knowledgeable or experienced rather than getting information from sites written by someone less informed. On several occasions, Bobby scrolled to the bottom or near the bottom

of the site to see if the site had an author. Bobby had to decide if he could trust the information on the site if an author's name appeared somewhere on the site. Before he started researching, I instructed Bobby to look at the bottom of the websites he visited for an author. Next, he had to strategize about if he thought the information on the site would or would not help him with his project using the critically evaluating information page (see Appendix B).

Reading print texts. During one day of searching, the participants were able to look at informational books on their topics. Bobby chose to look at an informational book about bears. It is not clear whether he used the information from the book as he organized his presentation.

Taking notes. Bobby took notes on at least two occasions. Bobby wrote information on the critically evaluating information pages to assist him with future searches. Bobby also printed information from at least one site.

Presenting Information

Bobby also used multiple strategies as he decided how to present his information. He considered his audience, addressed formatting, and applied technical skill. Bobby spent 20% of the time allotted for the project in the presenting information phase.

Considering audience. As the project was introduced, all students knew they would be presenting their final information to their peers and possibly their parents at the conclusion of the project. No field notes, Camtasia Studio (2009) recordings, interviews, or journals note that audience was a focus for Bobby as he completed the project.

Formatting the presentation. Bobby carefully attended to the formatting of his PowerPoint presentation. He spent time changing the size of the font, choosing a background, deciding on the layout of the slide, editing his slides for spelling, and deciding on sounds or other effects to add to slides. Bobby was particularly interested in listening to possible sound effects he

could add to his presentation. He was excited to hear the thunder sound effect. As he was listening to the sounds, he said, “[there’s] no bear growl, and that makes me mad.”

Applying technical skill. Bobby continued to demonstrate his computer literacy as he formatted his PowerPoint presentation. Bobby knew how to minimize or maximize a program so that he could work with two screens. He knew how to copy and paste pictures from websites onto his PowerPoint slides. Bobby needed help changing the layout of one slide because the picture was taking up more space than he wanted. I helped him change the format of the slide so he would not have to continue cutting his pictures.

Strategies Used Throughout the Project

The strategies that Bobby used in each phase of the project were unique to that phase. Other strategies Bobby employed—collaborating with peers, collaborating with the teacher, and expressing frustration—were evident in more than one phase. Bobby spent 17% of the time allotted for the project collaborating and 3% of the time being frustrated.

Collaborating with peers. Bobby’s ability to collaborate with his peers was a major focus for him. Bobby collaborated with his peers on numerous occasions. At the beginning of the project, another student in the class was also searching for information on bear attacks. I placed this student next to Bobby so they could help each other. Bobby told this student to type “*how to survive a polar bear or black bear attack* and it will tell you different search terms.”

During one day’s search, Bobby was talking out loud to himself as he searched for information about bear attacks. While Bobby looked at a picture of an injured bear, he explained to a peer that this bear had been attacked. Then together they looked at graphic pictures of a man who had been attacked by a bear. These pictures showed a lot of blood, some exposed bones, and torn flesh.

In addition to Bobby's ability locate information online, his knowledge of PowerPoint was evident. Bobby felt confident with his knowledge of PowerPoint and assisted other students in the class as they organized their presentations. Because my knowledge of PowerPoint is limited, I occasionally asked the class for help. Bobby assisted at least two students in adding sounds to their PowerPoint presentations. Also, Bobby volunteered to help a student copy and paste slides into that student's PowerPoint presentation.

Another example of collaboration is that Bobby received help from or was distracted by other students in the class. On one occasion, Bobby's neighbor told him he could scroll on the site with the lines on the track pad of his computer. Bobby was distracted by his peers at least six times during the project, as they were looking at a book, finding papers, noticing a low battery, or in other ways taking Bobby's attention away from completing his project.

Collaborating with the teacher. When Bobby was unsure about what to do next, he frequently asked me to help him with the next step. Bobby often asked for clarification or reassurance as he tried to answer his question about surviving a bear attack. For example, he asked me how to find information about the author. Next, he asked if he should write down a site so he could potentially refer to it later. An example of reassurance came as he decided to narrow his topic. He asked me if he could focus his presentation on a grizzly bear attack. Also, he asked if he could add information from the pages he had printed into his PowerPoint. Lastly, he asked if he could start organizing a PowerPoint presentation after he searched for three days. Occasionally, Bobby asked me to spell words for him. For example, he asked me if grizzly was spelled correctly as he typed it on one of his slides.

In addition to Bobby asking for clarification or reassurance, he sometimes needed redirection. He was unsure about what information to put on his slides, so I told him to write

about something interesting he learned about bears. Continuing with this strategy, he decided that he could type in a site he had visited previously and find information there. Perhaps he thought that doing this would help him find information for his slides.

Expressing frustration. Frustration for Bobby, at times, was being unsure about what to do next, not knowing how to answer his question, or simply needing redirection. Additionally, indirect frustration may be inferred because Bobby did not locate information, answer his question, or know what to do on his own. He did know that asking questions or collaborating with a peer would help him complete his project. Oftentimes, frustration was a result of other strategies Bobby used. The frustration he experienced was not documented in detail. However, one aspect of frustration, not knowing what to do next, was evident several times throughout the project.

An example of frustration that was documented is when Bobby completed a “critically evaluating information” page. He was not sure how some information on a website would help him with his project. He thought about it and realized it could help him because he learned that there are different kinds of bears. After he completed the page, he asked me what he should do next. I asked how he thought this site would help him answer his question about how to survive a bear attack. I asked a follow-up question about different types of bears to help him think about what to do next. He decided that researching different types of bears would be beneficial.

Summary

Bobby’s overall academic skills were low, which made school in general difficult for him. In addition to his low academic skills, Bobby was bullied at school. I was confident that Bobby would be able to complete the project with a lot of assistance. During the duration of this

project, Bobby decided to search for information about bear attacks, although at one point he did think about researching how to survive cancer.

As Bobby began to locate information, he employed an interesting strategy. He selected search terms without much assistance, but once he opened a website, he clicked back. He spent about nine minutes on one of the many sites he visited. It was rare for him to spend a significant amount of time on most of the sites. Once Bobby did open a site, he did not read most of the information on the sites he visited, but he was able to locate enough information for a simple PowerPoint presentation. Even as Bobby selected sites from a search results page, he was not methodical in his choices. At one point, as he located information, he clicked on site 10, a few others, then site 1 from a search results page. On one occasion, he opened site 115 from a search results page. It is possible that he did this for any number of reasons. Some possibilities may be that the information was too difficult for him to read, he may not have known how the information on the site would help him answer his question, or he may not have known how to use the information if he could read it. Bobby did not ask me to read information on websites to him. For whatever reason, Bobby clicked and looked (Leu, personal communication, 2011) as he opened and closed websites without asking for assistance. Additionally, Bobby did not consistently check the reliability of the sites he visited. The information he used may not have been written by someone with expertise related to bears. When he was looking at a site that had information about different types of bears, I did correct some words as he read it out loud. On this site, he was interested in how much the bears weighed and the fact that there is a sloth bear.

In analyzing how Bobby selected a topic, located information, and presented it, the most unexpected finding was that he collaborated with his peers. This was unexpected because his academic skills were low—I never would have thought he would assist his peers with their

projects. Bobby was especially helpful as his peers tried to add sound effects to their presentations. His peers most likely would not have asked him for help with other academic tasks, but because he felt comfortable using PowerPoint, Bobby was able to assist his peers. In addition to assisting his peers with their PowerPoint presentations, Bobby also shared information about his searches with peers next to him. When graphic pictures of a bear appeared after he opened a website, a peer and Bobby looked at the pictures and commented about how sad and disgusting they were.

Bobby was frustrated at times because he often did not figure out what to do next on his own. He asked me questions about what to do next frequently. Although he successfully completed the project, he needed a lot of help from me and his peers to finish.

In the end, Bobby's low academic skills did not prevent him from successfully completing this Internet inquiry project. If I had told him to read a textbook to find answers about how to survive a bear attack, he probably would not have had as much success. Bobby completed this literacy task because he knew how to access the mediums that were available.

Profile of Lily

This section profiling Lily begins with a description of her as a student. It is followed by a description of how she used strategies as she selected a topic, located information, and organized her presentation.

Background Information

During her sixth grade year, Lily developed a love for reading. She always had a book with her. Because of her strong commitment to improve in an area that had been a struggle, Lily no longer needed special education services by the end of the year to assist her in school. I selected Lily to be a participant in this study because her reading skills were higher than other

students' in the resource reading class. Her testing from last year shows that her IQ was average. Lily's basic reading skills, comprehension, and written expression scores were average. Most of the time, Lily was quiet in class, but she would share her opinion during class discussions. She had a lot of friends. Lily worked hard and completed her assignments on time. She listened when I gave instructions.

Lily had a computer at home that she used at least once every two days. She Googled things "just to see what funky things you can find." Most recently, she searched for information about Sir Arthur Conan Doyle. She also looked up pixie hair cut styles anticipating an upcoming haircut. Lily liked computers because of the fun things you can do on them. "You can play games, . . . download them. If you have a random question you want to ask, you do not have to go find your giant dictionary and pull it out and search for it, you can just Google it." She disliked computers when they broke.

At the time of her first interview, Lily was reading *A Diary of a Wimpy Kid* (Kinney, 2007) because her friend told her to read it. She also liked reading fantasy and science fiction, but she especially liked two series: *Wrinkle in Time* and *The Uglies*. Lily's favorite classes in school were reading and English. Overall, she liked school "other than waking up super early in the morning."

In contrast to Bobby, in the class project, Lily's searches were more focused. She knew what she was doing from the beginning of the project. Lily did not jump around to various websites. Lily had a plan and stuck with it throughout the project. Because of this, information about what she did in each phase is not as detailed as Bobby's.

Selecting a Topic

Lily used several strategies as she selected a topic, including deciding on a question or problem, and shifting her question, problem, or topic. Lily spent 1% of the allotted time for the project in this phase. Lily decided to do her Internet inquiry project about the Titanic because she read a book that had facts at the end that got her interested. “And I’ve always liked the idea of it and like try to figure out what made it sink other than it hit an iceberg. And like why exactly they weren’t prepared. . . . It was just kind of like one of those mysteries no one could ever figure out, and I like them.” From the beginning of the project, Lily knew she wanted to research the Titanic.

Question or problem. During this brief period of the project, Lily chose to research the question *how long did it take for the Titanic to sink?* Lily spent her search sessions looking for information related to the Titanic sinking.

Shift in question, problem, or topic. Initially, Lily decided to research how the survivors of the Titanic got rescued. Her PowerPoint presentation, however, was titled *How Long Did it Take the Titanic to Sink?* While her question shifted slightly, her searches related to the Titanic. She never replaced her question with a completely different topic.

Locating Information

This section explains how Lily employed strategies similar to Bobby’s as she located information online. She used a search engine, determined key words for searching, read results, read a webpage, evaluated information, checked the reliability of sites, read print texts, and took notes. Lily spent 63% of the total time allotted for the project in the locating information phase.

Planning the search. Lily made plans for searching to find out how long it took the Titanic to sink. Related to the Titanic sinking, she looked for information about hypothermia

“because most of the people that died didn’t drown. They died of hypothermia.” Lily also found information about icebergs. She commented, “I was shocked [by] how only a little bit of the iceberg is above water. I thought it would be a little bit more than that.” At the end of her second search session, her plan for searching further was to find out “where it was built and learn more about [the Titanic]”.

During her second interview, Lily indicated she was looking for maps of the inside of the Titanic, but “all I found was little model things and little pictures. Lily explained that she was going to look up other things that she had looked up before because she was “kind of running out of things to look up.” Later in the interview, Lily stated that she viewed “pictures of the telegram room.” While she was trying to find a map of the inside of the *Titanic*, she analyzed the pictures on the site she visited. She knew from pictures of the actors on this particular site that they did not suffer from hypothermia. She commented that the people in the pictures were “chalky white with bags under their eyes. . . Hypothermia is not supposed to do that. You are just supposed to start shaking really bad then you shut down. You’re not supposed to look like you came back from the grave.”

Next, Lily tried to find a map of Carpathia, the ship that rescued those who survived after the Titanic sank. She also wanted to find out when the Carpathia sank “because it sank a little while after the Titanic, on another voyage.” After this interview, she decided she had answered her project question. She started working on her PowerPoint presentation.

Using a search engine. Lily began each search session using Google.com as her search engine. Lily explained that she liked to use Google.com because “it is the easiest, I think. I trust it more because it’s a worldwide thing. It’s over in China now. And it gives me more of the questions like at the bottom and they’re not really weird.”

Determining key words. Lily's strategy for determining key words was hindered by her inability to spell words accurately. Lily is intelligent, but spelling words correctly was challenging for her. First, Lily used *how long did it take the Titanic to sink* as her key words. Lily decided to find information about *hypothermia* in her next search. She used the key words *how long does it take to die from hypothermia* after using a choice in the pull-down menu to help her select the correct spelling of her key words.

During her second recorded session, Lily decided to use *titanic iceberg* as her key words. Lily used a suggestion from the pull-down menu to help her select the correct spelling of her key words.

The next day's search began with Lily selecting *map of the Titanic* as her search terms. Again, she used the pull-down menu to help her select the correct spelling of those key words. Continuing with this day's search, she typed *how did the Carpathia get to the Titanic before the Californian* as her key words. She noticed the phrase *did you mean* followed by *how did the Carpathia get to the Titanic before the Californian*, with *before* spelled correctly. Lily decided to click on that suggestion, thus using the whole question as her key words for the search. Lily changed her search terms again during this day's search. Lily typed *Californian the shipe that typed upthe deid* as her key words. She noticed the suggestion at the top of her screen with the correctly spelled key words. She decided to click on *was the Californian the ship that picked up the dead* as her search terms. Later in her search, she typed *map of the interyer inside of the titan* as her key words. She used a suggestion from the pull-down menu with the correct spelling of *Titanic* in it. Lily used the phrase *inside of the Titanic* as her key words. Lily used *Dr. Ballard and Dr. Elazar Uchupi's map of the titanic* for her search terms at the end of this session. She noticed the *did you mean* prompt again and selected one that did not have *Dr.* in front of *Ballard*.

The next day's Camtasia Studio (2009) capture shows that Lily used *map of the inside of the titanic* as her key words. She used the pull-down menu to select the correct spelling. Later in this day's search, she tried to spell *Carpathia*, but she could not do it accurately. After a couple of attempts, I helped her spell it. Lily selected *Carpathians map* as her key words.

During Lily's last search, she went to Google images and typed *Titanic* as her key words. From the pull-down menu she highlighted *Titanic sinking* as her key words to find images for her PowerPoint presentation.

Reading the results of a search. Reading results involved Lily deciding which sites to view after a list of sites appeared on a search results page. As Lily decided which sites to visit from the search results page, she employed various strategies. She selected her key words, clicked on several sites, then decided what she was going to read. Lily went to several sites to locate information for her project. Table 3 shows the domains for the websites she visited along with the percentage of each domain name compared to the total number of sites she visited. Lily went to 33 sites to locate information for her project and 27 or 79% of them ended in the .com domain. The next closest web domain for the sites she visited was .org at 9%. She occasionally selected sites that were not helpful and quickly went to a different site.

Reading a webpage. Lily's pattern for reading a webpage was, first, deciding on search terms, second, scrolling through the results, and third, choosing sites that would answer her question. While she was a site, she used strategies to determine if the information would answer her question. For example, she clicked off the site when she realized the information would not help answer her question. During an interview, Lily indicated that she got off cha-cha.com quickly because "it's a texting site that you can ask questions to, so I thought maybe it could help, but it didn't turn out very useful." Recorded events show that Lily read information about

how the survivors of the Titanic were rescued, the Carpathia, maps of the inside of the Titanic, hypothermia, the Californian, and expeditions to look at the sunken Titanic. Lily scrolled through the webpages, pausing to read the ones she thought would answer her question.

Table 3

Frequency and Percentage of the URL Domains Lily Visited

	F	%
.com	27	79%
.edu	1	3%
.euronet.nl	2	6%
.net	1	3%
.org	3	9%
Total	34	100%

Evaluating information. Students were required to complete the critically evaluating information page during the first few search sessions. I instructed Lily to write down the site she visited and decide if she could trust the information on the site. After this, she had to strategize about whether she thought the information on the site would answer her question.

On the sheet where she wrote the most information, Lily decided she could trust the information on the site because “it’s mostly maps, and you can’t really fake those.” She thought the information on the site would help her answer her question because “it shows me where the Titanic went and where it was supposed to go.”

As Lily searched for information about how long it took the Titanic to sink, she went to Yahoo answers, but got off quickly. When I asked why she did not spend more time on the site she said, “I realized it was one of those things that anyone could add if they wanted and I got off.”

During the second interview, as she watched a segment from Camtasia Studio (2009), she again indicated a site she visited was not useful, so she did not spend more time on it. I asked why she went to wikianswers.com, or answers.com. She said she got off because she “did not understand the question answer thing.”

Checking reliability. Lily checked the reliability of the information on sites as she scrolled to the bottom of at least three. She did this to find authors of the sites she visited. I wanted Lily to get information from sites that had credible information, rather than sites written by someone less informed. Checking sites for an author was an attempt to determine the reliability of the information on sites she visited.

Reading print texts. I provided informational books one day for students to use as they sought answers to their questions. Lily decided not to read any of the books that were available that day.

Taking notes. I did not give Lily specific instructions about taking notes as she located information to answer her question. She did, however, take notes electronically and with a pencil and paper. She spent time writing down facts about the *Titanic*. When I noticed Lily was copying a chart from a website, I told Lily to print it. Lily did put some of the information from the chart on one slide in her presentation.

Presenting Information

After Lily located information, she organized her presentation. Lily spent 26% of the allotted time for the project organizing her presentation. The rest of this section outlines what Lily did in terms of audience, formatting, and technical skill.

Considering audience. Lily knew she would present her final project to her peers and possibly to her parents at the conclusion of the project. As with Bobby, none of the data sources indicated Lily strategized about her potential audience as she completed the project.

Formatting the presentation. Lily wanted to make her PowerPoint presentation look professional. She changed the font size, decided on the layout of the slide, and edited her slides for spelling. Lily did spend some time choosing a background by selecting a picture of the Titanic from the Internet.

Applying technical skill. Lily's technical skills related to computers were evident as she worked on the project. Lily knew how to select a background, change the font size, use Spell Check, and copy and paste pictures from the Internet. She knew how to make the picture from the Internet fill the slide as the background. However, a peer assisted her as she adjusted the size of her picture and inserted a text box.

Strategies Used Throughout the Project

Strategies used in previous sections were only employed in individual phases of the project. Collaborating with her peers, collaborating with the teacher, and frustration were evident throughout the project. Lily spent 8% of the time allotted for the project collaborating with her peers and 1% being frustrated.

Collaborating with peers. Lily spent a limited amount of time collaborating with her peers during the project. At the beginning, Lily shared some information about icebergs with her peers. She was interested in a peer's search about candy and another peer's search about sharks. Towards the end of the project, a peer helped her format a couple of slides in her PowerPoint presentation. Lily did not need much assistance from her peers to help her complete the project.

Collaborating with the teacher. Lily collaborated with me when she needed to know how to spell words. She used Spell Check on the computer, but when that did not yield the correct spelling or what she thought was close to the correct spelling, she asked for help.

Expressing frustration. Lily was frustrated at the end of the project when the computers were not working. However, none of the data sources show that Lily was frustrated as she located, organized, or presented information. In terms of computers, one day was particularly frustrating as the Internet would not work and several students were unable to log in. Lily planned to finish her PowerPoint presentation that day, but was unable to because the computers did not work.

Summary

Lily's average academic skills were evident as she completed this Internet inquiry project. Lily had developed a love for reading and at the end of the year she no longer needed special education services to be successful academically.

As Lily worked on this Internet inquiry project, she knew that she was going to research information about the Titanic. Each of her searches related to an aspect of the Titanic. Lily was especially fascinated with how icebergs have more under the water than above the surface. She also read information about hypothermia knowing some of the symptoms related to it. Maps of the inside of the Titanic and the Carpathia were part of her research as well.

While Lily located information about the Titanic, it became clear that her inability to spell accurately was making her ability to search for information less efficient. Lily relied heavily on the pull-down menu and the *did you mean* prompt on Google.com to assist her in selecting search terms with the correct spelling. Without these tools, she would not have been able to search for information online because the correct spelling of search terms directly relates

to the sites that appear on the search results page. Lily knew her spelling was poor, but strategized using the online tools to help her locate information.

Even though spelling was difficult for Lily, she was able to evaluate websites quickly. She got off a site when she knew the information would not answer her question. Lily spent time reading information on most of the sites she visited because she knew the information there was helpful. While Lily quickly determined that the information helped her answer her question, she did not check the reliability of most of the sites she visited.

Once she located information about the Titanic, Lily organized her PowerPoint presentation. She made sure it was professional and neat. To complete this final portion of the project, Lily needed assistance from one of her peers as she formatted a picture. Overall, Lily completed the project without much assistance from her peers. She asked me how to spell words occasionally, but for the most part, Lily worked independently to complete the project.

Spelling proved difficult for Lily, but she successfully completed this project. Lily knew which strategies to employ when spelling a word was difficult. Lily became frustrated when the computers did not work, but the project itself was not frustrating for her. She knew which sites would answer her question. Lily's higher academic skills and general search strategies helped her be successful as she completed this project.

Chapter 5: Conclusions and Recommendations

This chapter discusses conclusions related to the results of the study including search strategies, differentiation of Internet tasks, the value of Internet tasks for marginalized adolescents, and collaboration. Recommendations for teachers about incorporating the Internet into classrooms and recommendations for future research conclude this chapter.

Insights Gained from Results

A broad definition of reading has to include the Internet as a text that adolescents experience in classrooms. New literacies are crucial for adolescents because their world is digital and it is always going to be that way. Leu (2002) notes that students need to continually learn the skills and strategies that come with emerging new literacies. Technology and the new literacies that come with each one are in a constant state of flux. The Internet is always going to be part of adolescents' lives. They need to learn how to access the information on it effectively. Farwick Owens et al., (2002) explain that adolescents no longer open an encyclopedia to research and they are not confined to researching topics that are available in the school's library or a textbook. Adolescents literally have access to any topic on the Web. Technology is mobile, which allows adolescents to access the most current information in their own homes or anywhere on a cell phone, or tablet PC.

Insights About Search Strategies

Learning to access online information effectively may not be a natural skill adolescents have, but they are capable of developing these skills with practice. Adolescents have to learn how to strategically search for information online to complete assignments in school, find answers to questions, stay in contact with friends, and be marketable in a fast-paced, global job market. Yet, adolescents have developed natural search strategies. They know how to search for

information online (Moje, Overby, Tysvaer, & Morris, 2008). What students may not know, however, is how to use strategies to make online searching more efficient.

Developing a specific set of strategies for online research may not be possible because websites vary in layout, content, links, and other media; each website is different (Coiro, 2003). Yet, basic search strategies for locating information online can be taught. Using the strategies Coiro et al. (2006) developed in the Teaching Internet Comprehension to Adolescent (TICA) project is a place to start. Educators could develop lessons to teach adolescents how to implement each of the strategies as they search online. In addition to the 15 strategies from the TICA project, the Internet inquiry project Bobby and Lily completed shows that additional strategies—selecting search terms, formulating a searchable question, evaluating websites, and choice—need more explanation as these aspects of online research make locating for information challenging in an educational setting.

Selecting search terms. Giving students instructions about how to select search terms is challenging because the topic and purpose for locating the information impacts the search terms a student uses. A search engine uses key words as they are typed, and this poses a problem for young researchers especially. As Eagleton and Guinee (2002) explained, a “computer takes the student’s request for information at face value and is not flexible enough to interpret clumsy queries” (Eagleton & Guinee, 2002, p. 42). The search engine does not guess what a student is thinking; rather, it uses the key words exactly as they appear to bring up sites related to those terms. If students cannot spell key words correctly, they have to choose different terms or employ a different strategy to acquire the correct spelling of the words. Spelling challenges were especially evident as Lily selected her search terms. Lily often relied on the did you mean prompt on Google.com to assist her in spelling words correctly. Students similar to Lily may be

limited in their Internet searches if they are unaware of other strategies for obtaining the correct spelling of key words.

Formulating searchable questions. Students have to learn how to develop questions that are searchable—not too broad or too narrow (Farwick Owens et al., 2002). Bobby’s question about how to survive a bear attack was searchable. However, Lily’s question related to the Titanic sinking was too narrow. She could have located the answer to that question using one set of search terms. On the other hand, adolescents’ personal queries may not always be deep, so they will use different strategies to research products or find answers to questions about what happens in their daily lives compared to more formal academic or job-related searches. Developing questions that assist students in thinking about their topic or making connections may allow them to approach the inquiry project on a deeper level (Farwick Owens et al., 2002).

Evaluating websites. Another strategy that is critical for adolescents to internalize is evaluating the credibility of sites (Coiro, 2005). Students have to learn how to evaluate websites so they can make sure the information they find is accurate. How do students determine if the site is a hoax or not? Can students trust the information on the site? How is this determined? They should learn how to examine a site and think about what makes it reliable. Is this a skill that is developed as one matures? Bobby and Lily did not consistently evaluate the sites they accessed. On at least three occasions, Bobby and Lily did scroll to the bottom of the sites to see if they had an author. Does an author ensure that the information on the site is accurate and can be trusted? In their everyday searches, students may not know that they should be checking the accuracy of the information on the sites they visit (Kuiper & Volman, 2008). They may not think this is a strategy they need to use as they search online.

Furthermore, anyone can publish online (Eagleton & Guinee, 2002), so how do educators teach adolescents to sift through information and evaluate its truthfulness? Teaching adolescents how to evaluate the quality of digital information remains an area that needs to be studied in more depth (Agosto, 2002). Evaluating digital texts is challenging because sites that appear to provide accurate and credible information can be hoaxes. For example, Baildon and Baildon (2008) used a teacher-created website about saving orangutans to instruct her students about hoax sites. Another example of a hoax site is the Northwest Pacific Tree Octopus (Coiro et al., 2006), which leads readers to believe that a species of octopuses lives in a tree. The layout of the site makes the information look credible and accurate, but clearly it is not. Several websites fit in this category, but can students discern between a hoax and real information, especially when the hoax site looks real? Students need to be taught that not all printed or electronic information is of equal authority nor is everything in print true (Agosto, 2002). This poses challenges for teachers because it is impossible to preview every Website students may search as they complete assignments.

Additionally, evaluating websites may be difficult for adolescents because they do not read the information on a deep level. Dalton and Proctor (2008) note that it is rare for students to do more than search on a superficial level, and they read the content online at a minimal level. Bobby did not read information on most of the sites he visited. Rather he employed the click-and-look strategy Leu discussed (personal communication, 2011). Eagleton and Guinee (2002) indicated that students do not have the skills to locate high quality information. Perhaps this would have been easier if finding high quality information was the focus of the project. Bobby and Lily were focused on answering a question rather than finding quality information.

Letting Students Choose. Bobby and Lily may have been engaged and interested in the project because they each selected a topic on their own to research. Farwick Owens et al. (2002) state that successful inquiry projects include topics that interest students. They also indicate that students must be given the choice to research topics that they wonder and care about. In O'Brien's (2003) Literacy Lab, students who were not engaged with traditional literacy tasks became interested in literacy when they were given the opportunity to select a topic to research and use sources that were familiar. Bobby and Lily may not have been as interested in the project if I had assigned them a topic or sites to view to get their answers. Additionally, I do not think they would have been as willing to share the information they found because they would not have cared as much about it.

Insights About the Differentiation of Internet Tasks

As students search for information online, they have to formulate questions, choose search terms, and evaluate sites, but they approach each of these components in a unique way because their backgrounds differ. Bobby and Lily approached the assignment differently, but each met the requirements for it. Bobby did not have the research skills necessary to complete the project on his own, but he knew that collaborating and asking questions would assist him as he searched sites to complete the project. Even though he lacked the academic skills to complete the project, his desire to complete it was strong enough to employ strategies to be successful. I gained greater admiration for Bobby because I was able to focus on the skills he had, rather than the ones he did not have (Farwick Owens et al., 2002). I began to view Bobby in a more hopeful light as I studied him throughout this project. Bobby did have skills, but they were often masked with the print-heavy tasks teachers assigned him. If Bobby had been able to use more technology

in his science and history classes, he would have displayed an entirely different skill set to his teachers and peers.

On the other hand, Lily did have the academic and research skills necessary to complete the project on her own, except for spelling. Lily's entire project centered on the Titanic; she was focused from the beginning. Lily knew how to locate information on a website (Baildon & Baildon, 2008; Kuiper & Volman, 2008). Not only was Lily able to locate information on a website, she successfully organized it in a PowerPoint presentation.

Bobby and Lily's skills were different, but they employed the strategies they needed to complete the project. Educators have to be comfortable with students approaching assignments in different ways. Teaching students basic skill sets is essential, but when possible, classrooms should be set up to allow students to approach assignments uniquely. This does not mean the environment becomes chaotic. Allowing varying approaches to assignments may be uncomfortable for some teachers, but students benefit because they learn to strategize and solve problems independently.

Insights About the Value of Internet Tasks for Marginalized Adolescents

Adolescents have grown up in a digital world and have developed strategies for accessing information online. Whether or not these strategies are effective may depend on the task. Adolescents who are marginalized may not be able to consistently read a textbook in a science or history class, but they may know the strategies for locating information to complete the same assignment online (Kuiper & Volman, 2008). Bobby would have needed constant assistance if I had assigned him a print text to read about bear attacks. However, Bobby successfully completed the project because he knew how to use the Internet to answer his question. Lily would have

been able to complete this project using a print text because her reading skills were much higher than Bobby's.

New literacies can help those readers who have spent most of their academic lives struggling with print texts. However, adolescents who are marginalized may find online searching challenging because they may not know which information to focus on when they open a website (Coiro, 2005). Bobby's searches are an example of this. He often opened a website, but did not read information on it. Recorded data do not indicate why he employed this strategy. It may be that he did not have clear search plans, or the text was too difficult for him to understand. Interestingly, online searching was challenging for Bobby, but he completed the project despite the reading difficulties he had.

Overall, digital texts have merit in classrooms for students like Bobby. He successfully completed this Internet inquiry project because he was able to use the Internet—a text that is motivating (Eagleton & Guinee, 2002; Farwick Owens et al., 2002) and familiar to him. Bobby knew how to type search terms in Google to bring up sites that could have answered his question. He knew how to create a PowerPoint presentation. Students who find accessing print texts challenging seem comfortable using computers and searching online.

For marginalized readers, it may be wise or effective to limit the number of sites they can visit (Sutherland-Smith, 2002). On the other hand, Dalton and Proctor (2008) explain that limiting the number of sites in school for students may be detrimental because outside of school the Web is not a "controlled space" as students have unlimited access to the Internet (p. 300). If students are given a set of preselected sites to research, they miss the opportunity to sift through information that may not relate to their search. Part of becoming a "critical consumer" (Dalton & Proctor, 2008, p. 300) requires students to view appropriate sites that relate their search and

decide if the information presented answers their question. When students are only given selected sites to view, they may assume that the answers to their questions are on those sites, which causes students to miss the opportunity to analyze and eliminate information that does not relate. I chose not to limit the sites Bobby and Lily could view because I wanted to analyze how they located information online using the entire Internet. Also, when I implemented this project informally with another group of students, I gave them a limited list of sites they could visit. I learned that this limited the answers they could find. I decided then that when I formally conducted this Internet inquiry project, I did not want to limit where they could search and locate answers.

Internet inquiry may be a vehicle to see how struggling readers can use, organize, and present information. The Internet is a viable tool to find out how adolescents use information.

Insights About Collaboration

In this study, Bobby relied heavily on collaboration, whereas Lily only collaborated with me or a peer when she needed minimal assistance. Bobby would not have been able to complete the project on his own. On a broader scale, collaboration is an essential component of the workplace, as people work together to solve problems (Leu, personal communication, 2011). While students in junior high are not the workforce yet, they can collaborate with peers at school.

Classrooms are natural places for collaboration to take place. I notice classrooms in my building where students consistently work independently, but much more learning could take place if students were given opportunities to work together. Teachers that combine collaboration with technology create an especially impactful environment for student learning. A setting like this allows students who often have a hard time discussing print text to feel comfortable discussing digital ones.

Bobby and Lily each spent time sharing information about their searches with their peers and their peers seemed interested in their searches. On a couple of occasions, Lily shared aspects of her PowerPoint presentation. In my experience and observations, students are more willing to assist each other as they figure out how to use programs or search online compared to a print text. It is less common for adolescents to go to a peer and discuss a text on their own. When I have given students time discuss texts, I have to outline explicitly what I want them to discuss in the text. Digital texts yield natural, nonteacher directed collaboration to take place. Adolescents are interested in each others' online searches, whereas they may be less interested in what a peer thinks about a printed text. Leu, Kinzer, et al. (2004) state that "we need to begin to assess how well students can learn new literacies from others and how well they can coconstruct meaning and collaborate in constructing written information with others" (p. 27).

Recommendations

While Internet inquiry presents benefits, especially for adolescents who are marginalized, challenges are evident. Incorporating new ideas into classrooms is difficult because it requires change, which is hard and uncomfortable initially. However, digital texts do not have to replace print ones (O'Brien, 2003). Incorporating digital and print literacies into curriculums will impact student learning for the better because the needs of students who struggle with digital or print texts will be met.

Recommendations for Teachers

In terms of online research, teachers need to provide assistance to specific students. For example, Lily had difficulty with spelling. Teachers can show students how to use the pull-down menu as they are typing terms into Google.com. If a page of search results appears after incorrectly spelled search terms have been used, teachers need to show students the did you

mean prompt at the top of the screen. These are spelling strategies students should know so they can search successfully when they are searching independently. They may not know if the spelling they are using is close to accurate or not, so typing the word into dictionary.com and listening to the pronunciation of the word may be a strategy they can use occasionally.

Additionally, students similar to Bobby also need support as they complete online research. Bobby often did not know how to complete the next step of the project independently. Teachers have to mediate between assisting an entire classroom of students while providing time to work more intensively with students similar to Bobby. Finding a balance between these two aspects of teaching is challenging.

Another aspect of online research that is challenging is developing a question that is searchable. Students should be guided to research topics that are interesting to them. However, guiding them to ones they are less informed about may be difficult. Of course, many students are going to choose topics that they know a lot about so they can complete the assignment more quickly. To get around this, teachers may require students to research a current issue that they may not know a lot about. Teachers could assign students to trade topics and become an expert about someone else's interest.

Regardless of the topic students research, they have to know how to gather information from reliable sources. Instructing students to locate the author on a site is a good place to start, but teaching them how to corroborate the information with other sources may ensure that the information is more accurate. Teaching students how to do this would require time and patience because students who are probably used to looking at one source would be guided to search another site to check for the same information. Students may resist this change.

While online research happens in classrooms, teachers have to allow discussions among students to occur. I would like to see more classrooms where students collaborate with each other to complete projects or solve problems rather than consistently working independently. Using technology in classrooms brings a collaborative element with it. A silent environment is not conducive to online searching as adolescents are interested in each others' searches. They like sharing pictures on websites, helping each other access programs, and format presentations. Adolescents enjoy interacting with each other.

Also, adolescents who are marginalized may be more inclined to participate in school if they are given opportunities to use the texts that are familiar to them. Adolescents have a lot to offer. Their abilities are evident when they can use texts that show what they can do rather than what they cannot do.

Recommendations for Future Research

Incorporating online research into my classroom allowed me to see some of the complexities related to online searching. Using Camtasia Studio (2009) software to analyze how Bobby and Lily used computers was essential. I recommend using this software in future research to examine how students search online, complete projects, or use computers for any other classroom purpose.

In addition to using Camtasia Studio (2009) to record the actions Bobby and Lily completed while using computers, teaching explicit lessons related to each of the 17 strategies listed in this study would be beneficial. How can teachers effectively instruct marginalized middle school students to develop a question that is searchable? What do marginalized middle school students need to learn to evaluate websites accurately? What strategies do marginalized readers need to develop to read websites that are difficult to understand? How can collaboration

become an integral component in classrooms to improve student learning? Projects related to each area individually would add to the field of New Literacies and adolescent research.

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Appendix A

Parental consent and student assent form to be a research subject

Introduction

I, Jennifer Thomas, am conducting a study to learn about the decision-making processes adolescents use as they are searching the Internet for my master's thesis. The research is being supervised by Dr. Morrison, Associate Professor in Teacher Education in the David O. McKay School of Education at BYU.

Procedures

Your student will participate in a six- to eight-week Internet inquiry project related to the theme of survival. He or she will be reading various texts, developing a research question, answering the question with information from the Internet, writing in his or her journal about the project, completing assignments, and presenting it to you and his or her peers in an evening of excellence. If your student is selected to be a participant in the study, he or she will be using a program that monitors his or her searches and records his or her voice while on the Internet. Additionally, I will be taking field notes about your student.

Risks/Discomforts

The risks and discomforts of this study are minimal. Your student may not feel comfortable presenting his or her ideas in front of the class. If this describes your student, he or she can present to me only. Also, your student may not feel comfortable having his or her voice recorded using Camtasia Studio.

If your child is selected to be a focus of the study, he or she will be using an online monitoring program that records what he or she did on the Internet and his or her voice. I will be the only one other than your student to hear his or her voice when I interview him or her. Your student may not feel comfortable having his or her voice recorded using the software. I may use segments of the Camtasia Studio sessions in professional presentations. Your student's voice will not be shared with the audience.

Other students in the class will know that your student is participating in the study.

Benefits

Your child may not receive any direct benefits from participating in this study. However, his or her willingness to participate may give us greater insight into what processes adolescents use as they search the Internet.

Confidentiality

Your student's identity will remain confidential. I will use pseudonyms as I save the data during the study. I will use a pseudonym for your student in my thesis. All data, journal entries, Camtasia Studio sessions, recorded interviews, assignments, and my field notes will be stored in a secure location.

Compensation

No compensation will be provided for participating in this study. No extra credit is available for participation in the study.

Participation

Your student will complete the Internet inquiry project as a regular part of instruction. Your student's willingness to be a focus of this study is optional. Your student can opt out of the project at any time. This will not influence his or her grade in the class.

Questions about the research

If you have questions regarding this study, you may contact Jennifer Thomas at jthomas@alpine.k12.ut.us or 801-766-5273 ext. 202, or Dr. Morrison at Timothy_Morrison@byu.edu or 801-422-7554.

Questions about your child's rights as a research participant

If you have questions about the study, but you do not feel comfortable asking the researcher, you may contact Dr. Christopher Dromey, Chair of the Brigham Young University Institutional Review Board, at 801-422-6461, or email him at christopher_dromey@byu.edu.

I have read, understand, and received a copy of the above consent and desire of my own free will to participate in the study.

Parent Consent

_____, 2009
Parent's name

_____, 2009
Parent's signature

Student Assent

_____, 2009
Student's name

_____, 2009
Student's signature

Appendix B

Critically evaluating information

Directions: You are going to make sure the sites you are getting information from are reliable. It is important to make sure you report accurate information.

<p><u>Strategy:</u> Follow the links on the “about us” page until you know the name of the site’s author, his or her credentials, and who or what they represent.</p>

<p><u>Why it is important:</u> To narrow search results and find something specific more quickly.</p>	<p><u>When I would use it:</u> Whenever I do not know the address of a site and need to use a search engine to find something.</p>
---	--

1. The site I went to is _____

2. The author is _____

3. His or her credentials (education, experience, research) are _____

4. Based on what you discovered from the “about us” page, can you trust the information on this site? Explain your thinking.

5. How do you think the information on this site will help you with your project?

6. If you do not think this information is reliable, explain why.

Adapted from Castek, J., personal communication

Appendix C

Sample interview questions for Bobby and Lily

Background information

Do you have a computer at home?

Is there anything you dislike about computers?

What are you reading right now?

What do you like about computers?

What is your favorite class in school?

Locating information

How difficult is it to read a website you have never been to?

What were you hoping to find here?

What were you trying to find?

What were you thinking?

When you go to a site, how much are you reading text vs. looking at the pictures?

Why did you choose to use Google?

Culminating questions

What did you like about it?

In your opinion, what would make the Internet more user-friendly for teenagers?

Is there anything you disliked about it?

What could I do differently next time to make the project better, for a 7th grader like you?

What new things did you learn as you used the Internet for this project?

What was hard about it?

Appendix D

Sample interview questions for Bobby

Background information

Do you like *Fablehaven*?

Have you ever seen a bear?

What do you use the computer for?

What was the most recent search that you did?

What is your favorite class in school?

Topic selection

Why are you searching about bear attacks? What makes you interested in bear attacks?

Locating information

How did you know that this was not the site you wanted?

As you were looking at this site, what did you notice about it?

Did you find cool information about bears?

Did you look at any of these suggestions?

Do you think the pictures could be helpful at all?

Do you understand information better when you hear it out loud?

Does this pull-down menu help you with spelling?

Why did you not choose any of these choices from the pull-down menu?

How come you typed in the URL instead of down here in the Google search bar?

Why were you on this site so long?

Why did you decide to help your peer?

Why did you choose where are bears located as your search terms?

Why were you interested in how much the bears weighed?

So you think if it has an author it is better?

Was there anything on this page that was hard to read or difficult to understand?

When you are using the Internet at home, not for a project, do you look more at the words on the page or the pictures?

When you come to a word on a website you don't know how to read, what do you usually do?

When you were done with this site, you told me that you didn't think it would be helpful. But now you are thinking it is; why?

Why did you get on and off those sites so quickly?

Why did you keep searching for those sites and not start with some different ones?

Why did you think this site would be most helpful compared to the other one?

You said you're not going to trust this site; why?

You're still on this site, then you clicked all the way back to Google. Why did you go all the way back?

What are you going to research today about the different kinds of bears?

Why was the picture of the baby polar bears cuddling with their mom interesting to you?

Presenting information

Why did you choose that background?

Was it hard to come up with topics for your slides?

Were you trying to think of a title here?

What are you going to put on your PowerPoint?

Why did you choose "how to survive a brown bear attack" as your title?

Why did you choose that picture?

How did you know that the picture should go there?

Were you looking for a specific background or specific colors?

Were you trying to set the picture as a background so it would take up the whole slide in the back?

Culminating questions

What do you think of the project overall?

What else would you like to tell me about the project?

What made it easy?

Appendix E

Sample interview questions for Lily

Background information

Do you make websites?

How frequently do you use your computer at home?

Overall, do you like school?

What else do you like to read?

Topic selection

Why did you choose the *Titanic*?

Locating information

Are there specific areas, like aspects of the *Titanic*, you are hoping to find more information about?

Did anything on this page distract you?

Was there something on that page you plan to use for what you are doing?

Did you notice how there are random letters throughout the site?

Did you read the words or just look at the pictures?

Do you ever scroll down on the search terms that appear in the pull-down menu?

Do you print information if you find something you like? Or you just know to go back?

Do you think that if you had different search terms, if you had typed something different into Google, you would have had a different site come up?

How come you decided not to change the spelling?

How did you come up with those terms?

How did you decide where to go next?

How do you know something needs to be corrected?

How do you know when you have found something you really want?

In general, how helpful is spell check for you?

What other search engines have you tried?

When you do find something you want, do you record or capture that so you can have it for later on when you are trying to gather information?

Why did you decide to type in the whole question?

Why did you find this part interesting?

You got off this site pretty quickly; why?

You were on this site for awhile; why?

Presenting information

How are you going to present your information?

So you had *Titanic* there and then you decided to change your title; why?

Why did you decide to write your title as a question?

Why were the pictures appealing?

Culminating questions

Do you think your research skills have been refined as you've used the Internet?

Do you have a better sense of what to search for?

What was enjoyable about the project?

Appendix F

Modified Taxonomy of Internet Reading Comprehension Skills and Strategies

Selecting a Topic: Decisions and strategies for selecting a topic.

1. Question or Problem: Identifying a question or defining a problem. This may include:

- explaining why he or she is interested in the project.
- giving reasons for selecting a particular topic to research.

2. Shift in Question, Problem or Topic: The participant changes his or her original question or problem based on the availability of information or presentation of new information (abandonment of the original question). This may include:

- deciding to search a different topic

Locating Information: Decisions and strategies for searching for information on the Internet

3. Searching Plans: The participant makes definitive plans for searching. This may include:

- articulating what his or her plans for the day's search
- not articulating what his or her plans for the day's search

4. Use of Search Engine: The participant uses a search engine to locate an information resource (includes strategies or reasons for choosing a search engine). This may include:

- going to Google.com, ask.com, yahoo.com, or any other search engine.
- highlighting from the pull-down menu
- typing an address in the URL to start searching.

5. Determining Key Words: The participant enters a key word or words to search for information in a search engine. He or she chooses or changes his or her search terms. This may include:

- correcting misspellings or using variations of words to obtain correct
- spelling of key words
- explaining why he or she used those search terms.
- knowing that a word is spelled incorrectly.
- not typing anything in the search bar—it is blank.
- not using use suggestions from the pull-down menu when typing search terms.
- using suggestions from pull-down menu when typing search terms.

6. Reading the Results of a Search: Strategies for reading and selecting an information source on a page of search engine results. The participant has not selected a website yet. This may include:

- choosing a website from results; clicked on site #___ on search results page.
- clicking back to return to search results page.
- clicking next on search results page.
- hovering over the title of a site.
- scrolling through search results.
- using suggestions from showing results at the top of the search results screen.
- using the back button repeatedly.
- using the forward arrow, clicking forward on search results page.

7. Webpage Reading: Reading a single webpage to locate information or deciding where to go next (not reading search engine results). The participant selects a site from the search results page and spends time on the site. This may include:

- clicking back immediately after or before a website comes up or staying on a site briefly.
- clicking back while on a webpage to get to a previous page; not search results.
- clicking forward while on a webpage.
- clicking links on a website.
- explaining or attempting to explain why he or she was on a site.
- explaining what he or she was hoping to find on a site.
- highlighting part of a site.
- indicating if something was hard or easy to understand on a site.
- knowing what to search.
- making hasty/less strategic reading decisions—bypassing useful information.
- pronouncing unknown words on a site
- reading text and or pictures on a website.
- returning to the home page.
- scrolling on the website.
- selecting a picture from a site.
- skimming the entire website, quickly scrolling up and down
 - the right site

8. Evaluate: General statements or actions about critically evaluating information. Participants explains some aspect of the site. This may include:

- deciding that a site might be helpful.
- explaining what he or she expected to see on a site.
- finding something interesting on a site.

- finding specific information on a site.
- finding unexpected information on the site.
- finding valuable information on a site.
- indicating the site will help him or her complete the project.
- knowing what to do with the information.
- not knowing how to use information.

9. Reliability: Verification of information for reliability; the information's level of trustworthiness is based on information about the author and the publishing body. This may include:

- confirming or rejecting information from a source.
- doubting the information on a site.
- examining the site reliability by scrolling all the way to the bottom of the site.
- identifying the author or institution of a website.
- states he or she is not trusting a site.

10. Text-based Reading: The participant uses print sources (i.e., informational book) to find information.

11. Note Taking: The participant takes notes electronically or with paper and pencil. This may include:

- printing information from the Internet.
- writing notes using paper and pencil.

Presenting Information: Decisions and strategies for presenting information.

12. Audience: The participant monitors the communication of his or her information for audience or voice (i.e. formal versus informal writing style).

13. Formatting: The participant focuses on the elements of his or her presentation. This may include:

- choosing a font, size, or color.
- correcting misspellings or using variations of words on a slide.
- deciding on the layout of the slide.
- finding sounds or other effects to add to slides.
- going to a slide or inserting a slide.
- proofreading the text on his or her slides.
- resizing a picture
- selecting background for the slide.
- slide design
- thinking about what to write.
- types on a slide or inserts a text box.

14. Technical Skill: The participant uses technical skills that show specific knowledge about the computer and or software interface. This may include:

- assuming something is attached to spamware
- choosing an Internet browser (Mozilla Firefox or Internet Explorer)
- clicking on a red x
- copying and pasting information or pictures from website onto PowerPoint slides
- dealing with pop-ups, error messages, access denied, server not found, network timeout, low battery, page can't be displayed, volume control, format, placeholder, server not found, circle with a slash through it, demonstrating specific knowledge about computer; i.e. knowing what the lights on the computer indicate
- hovering over or using a toolbar
- minimizing or maximizing a program
- opening an Internet window to search in
- opening or exiting a program (PowerPoint, Word, Internet)
- printing information from the Internet
- see full image
- using spell check

Strategies Used Throughout the Project

15. Collaborates with peers: The participants work with other students to make decisions about searching, locating information, or presenting. This may include:

- asking peers for help with his or her own project
- assisting a peer in locating information for his project
- being distracted by neighbors, pictures on a site, books
- helping peers with their presentations
- spelling words for his or her peers.
- talking to himself or herself

16. Collaborates with Teacher/researcher: Participants worked with the teacher/researcher to make decisions about searching, locating information, or presenting. This may include:

- asking the teacher/researcher questions about what to do next, clarifying questions about the project
- obtaining correct spelling of words for PowerPoint slides or key words for searches
- searches

17. Frustration: The participants were unable to make decisions to further their completion of the project. This includes:

- being confused about what he or she should be doing
- being unsure about alternative strategies when comprehension breaks down

- inability to answer his or her question
- inability to locate information online

Adapted from Coiro et al. (2006)