WEBQUESTS IN THE ENGLISH CLASSROOM: HOW DO THEY AFFECT STUDENT LEARNING?

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ABSTRACT

Kari Lee Siko: WebQuests in the English classroom: How do they affect student learning?
(Under the direction of Cheryl Mason Bolick)

WebQuests are an Internet-based technology application in which groups of students follow a specific set of steps toward the completion of a final project on a specific subject or multi-disciplinary subject (Dodge, 1997; 1998; 2005; 2006). As with many other technologies and technology applications, there is a void in the published research that examines the effects that WebQuests have on students and student learning. Many educators are using technologies and technology applications, such as WebQuests, that have not been examined in depth for the effects on student learning. This results in teachers using instructional tools that have not been proven to help in learning. This current situation of teachers using technologies and technology applications which are not proven instructional methods is the basis for this research study on WebQuests and student learning. This research study was conducted to evaluate the effectiveness of WebQuests to ensure that the teachers who are using this technology application are using an instructional method which is proven to enhance student learning. Through the use of both quantitative and qualitative data, this study begins to examine not only the effects of WebQuests on student learning but also lays the groundwork for future research on the effects of other technologies and technology applications on student learning.

In this study, the students originally believed that they had learned during the completion of the WebQuest; however, after not being able to complete the transfer activity, the students changed their minds and said that they obviously had not learned the material. Students seemed to think that they had learned simply because they had completed the WebQuest, but realized that they had not retained any knowledge on the poetic literary terms presented in the WebQuest after failing to successfully apply the literary terms to a new poem. This is verified by the slight decrease in scores on the post-test compared with the pre-test. Further research needs to be conducted to see if the level of teacher involvement affects student learning with the WebQuest.

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CHAPTER ONE: INTRODUCTION

Every year, new technologies and technology applications are introduced into classrooms. WebQuests, however, are a technology application that have been around for over ten years and are used in classrooms around the world. WebQuests are an Internet-based technology application in which groups of students follow a specific set of steps toward the completion of a final project on a specific or multi-disciplinary subject.

WebQuests have become ubiquitous in today's classrooms. There are several websites dedicated specifically to creating and sharing WebQuests with teachers throughout the world. One such website is the QuestGarden (http://WebQuest.org) sponsored by Bernie Dodge, the creator of WebQuests. QuestGarden has 34,356 registered users in 120 countries. WebQuests registered on QuestGarden are written in one of seven different languages including Catalan, Dutch, French, German, Portuguese, Spanish, and English. There are over 19,000 quests registered with QuestGarden as of December 2006 (Dodge, 2006). With this large number of WebQuests available for teachers' use, research needs to be conducted to examine the effects of WebQuests on student learning to determine if this technology application should continue to be used in schools and classrooms and to ensure that WebQuests are serving instructional goals.

Many educators use technologies and technology applications that have not been examined in depth for the effects on student learning; additionally, teachers use instructional tools that have not been shown to help with learning. As with many other technologies and technology applications, little research has been conducted on the

effects that WebQuests have on students and student learning. This current situation of teachers using technologies and technology applications which are not proven instructional methods is the basis for this research study on WebQuests and student learning. Research needs to be conducted to evaluate the effectiveness of WebQuests to ensure that the teachers who are using this technology application are using an instructional method that will enhance student learning.

In 1995, Dodge and March, of San Diego State University, created "WebQuests," an Internet-based activity for students. WebQuests were created as inquiry-oriented activities that would allow students to use the Internet to acquire new knowledge and expand understanding. Dodge recognized the futility of sending students on unstructured searches for information on the Internet, because there was too much information that was not valid and useful for the students (Dodge, 1995; 1997). By previewing the websites that students would use in their projects, teachers could ensure the quality of the information used. Thus, WebQuests were designed so that students would use teacher-previewed websites that contained valid and relevant material. An overview of WebQuests follows the theoretical framework introduction and then WebQuests are explained more in-depth in chapter two.

Theoretical Framework

This study is grounded in two theoretical areas, constructivism and cognitive science. These two areas blend together to create an understanding of student learning which provides the theoretical framework for this study of WebQuests. The theoretical framework is shown in Figure 1.

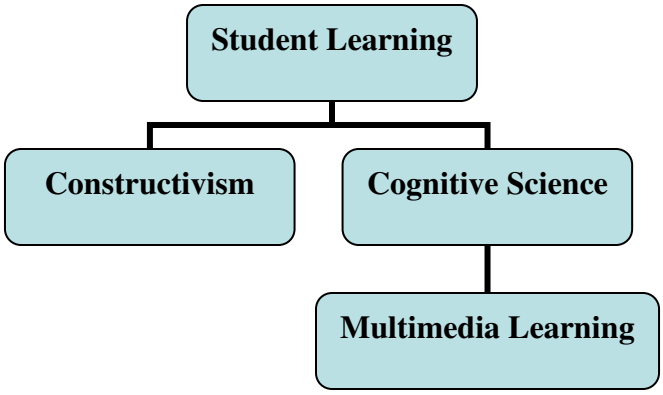

Figure 1: Theoretical Components of Student Learning

Constructivist learning theory, which is described in more detail in chapter two, acknowledges that knowledge is an active construct of a learner's personal and social experiences. Social constructivism allows for learners to interpret social experiences and then actively create knowledge individually.

The field of cognitive science, which is explored more in chapter two, focuses on how people understand knowledge and learn. Some research in the field of cognitive science assumes that learning is an active process. Additionally, learning with technology needs to be developed that provides learners scaffolds to ensure that learning occurs. Multimedia learning theory works within cognitive science to better understand how the technology affects students during the learning process. Multimedia learning theory can be defined as using text and pictures to assist learners in learning. The focus of multimedia theory is on the examination of using senses (auditory and visual) to learn new information or better understand prior knowledge.

Within multimedia learning theory, there is a cognitive theory called the active processing assumption which focuses on what learners do with the information once it is

received via the auditory and sensory channels. The active processing theory assumption can be broken down into three parts: the selection of information, the organization of information, and the integration of information. When learners select information, they are deciding what words and images they need to input through either the auditory or visual channel. Once information is selected, the learners then organize the images and words to help make better sense of what they are learning. Finally, the images and words that have been selected and organized need to be integrated into the new knowledge presented by the multimedia technology (Mayer, 2001).

The combination of cognitive science and constructivism creates the theoretical framework for this research study and will focus the research to ensure that learning is being measured.

Overview of WebQuests

WebQuests have become a common technology application for teachers of all subjects and grade levels. As of December 2007, there were over 8 million hits to the WebQuest Garden website since February 1998 (Dodge, 2006). An ERIC search at the same time resulted in 96 hits on the keyword "WebQuest." Many of these articles, written by practitioners, focused on the uses of WebQuests and student and teacher perceptions of WebQuests (Libscomb, 2003; McGlinn & McGlinn, 2004; Perkins & McKnight, 2005; Strickland, 2005; Van Fossen, 2005; Yoder, 1999). A more thorough overview of the published studies dealing with WebQuests is presented in chapter two.

Despite the fact that policy-makers "are demanding evidence that their investments in educational technology have been worthwhile" (Pollard & Pollard, 2004/2005, p. 146) there is a lack of research involving the effects of WebQuests on

student learning. This lack of research is intriguing; in-depth studies need to be done to fill this void.

Elements of a WebQuest

WebQuests are comprised of six elements, commonly referred to as building blocks (Dodge, 1997; 2004). The six building blocks include an introduction, a task, a set of resources, the process, a description of the evaluation, and a conclusion.

The *introduction* not only contains background information for the WebQuest, but sets the stage for the activity the learners will complete. The *task* is a description of the activity that is "doable" for the students. The task also often identifies the various roles the learners will undertake during the course of the WebQuest. The *process* portion of the WebQuest provides step-by-step instructions for the learners to follow in order to complete their activity and offers a clear description of the individual activities that each learner is responsible for during the process. The *resources* include links to the Internet-based resources that the learners will use throughout the activity in order to complete the task. The resources can be placed throughout the process portion of the WebQuest. The *evaluation* informs the learners of the methods used to assess the final project, usually in the form of a checklist or a rubric. The *conclusion* brings closure to the activity. The conclusion allows learners to have closure and enables the learners to reflect upon what they have learned through the WebQuest (Dodge, 1997; 2004).

These six elements combine into a web-based inquiry activity that students complete either individually or in groups. WebQuests can either be short-term or long-term. Short-term WebQuests usually focus on basic knowledge acquisition and integration and are completed within one to three class periods (Dodge, 1997). Learners

usually deal with a significant amount of new information and are asked to make sense of the information in short-term WebQuests (Dodge, 1997). The long-term WebQuests require learners to extend and refine knowledge and usually take from 1 week to a month to complete. During this time learners work with a body of knowledge in depth and demonstrate their understanding of the information by transforming it into something that others are able to respond to (Dodge, 1997). Both types of WebQuests, short-term and long-term, require learners to process a large amount of information and integrate that information into knowledge for their own use. The process of selecting, organizing, and integrating information needs to be examined to evaluate if learners are truly learning while completing a WebQuest.

Study Overview

The goal of this study is to begin to fill the void of research on student learning and WebQuests. Multiple data collection and data analysis methods were used with nine classes of ninth-grade English students to assess if learning occurs through the students' completion of a WebQuest. Comparison of pre-test and post-test data informed this study. Additionally, this study examined how students process the knowledge acquired during the completion of the WebQuest through focus groups with a subset of participants.

Research Questions

The lack of research published about learners' ability to learn by completing WebQuests informed the questions that framed the study. This study addressed the following research questions:

1. Do learners learn the addressed material through the use of WebQuests?

2. How do learners learn with WebQuests?

   a. How does the learner select information while completing the WebQuest?

   b. How does the learner organize the information selected while completing the WebQuest?

   c. How does the learner integrate selected and organized knowledge during the WebQuest for the completion of the final project?

Description of Chapters

This introductory chapter focuses on the purpose for this mixed-methods study on the effects WebQuests have on student learning in English classrooms. An overview of the literature and study provides background for the following chapters. The second chapter contains relevant literature for the study of WebQuests and student learning. The following bodies of literature are reviewed: educational technology; WebQuests; constructivism; cognitive science; multimedia learning; and technology and student learning. These bodies of literature represent areas surrounding the understanding of student learning and WebQuests. In the third chapter, the research design is described. Data collection strategies, data management, and inference quality are described, and the interview and observation protocols are provided. The fourth chapter is a report of the study. The quantitative and qualitative data are analyzed and presented as a report of the study. The final chapter provides a review of the research questions, conclusions that can be drawn from the research, the limitation of this study, and possible research studies which will follow this study.

Summary

A close examination of WebQuests' effects on student learning needs to be completed to ensure that the technology applications currently being used in classrooms are having positive effects on students and student learning. The lack of published research on this topic creates a gap in the literature. This gap in the research provides the opportunity to use multimedia learning theory and the active processing assumption to examine in depth the effects that WebQuests have on learners and the learners' selection, organization, and integration of information from the inquiry-based project.

CHAPTER TWO: REVIEW OF THE LITERATURE

A thorough review of the literature is needed to frame this study. This review of the literature begins with a discussion of technology, focusing specifically on educational technology, current research on educational technology, and criticisms of educational technology. WebQuests and the literature surrounding this technology application are subsequently described. After the discussion of WebQuest literature, the theoretical framework for this study is formed using the literature from the fields of constructivism, cognitive science, and multimedia learning theory bodies of literature. These theoretical areas are combined for an understanding of student learning used in this study. Finally, connections between student learning and technology and student learning and WebQuests are explored by discussing the literature in these two areas.

Technology

The meaning of technology has evolved over time. In order to understand current educational technology, it is important to first understand the origins of the word *technology.*

The current word *technology* comes from the Greek word *techne* (Technology, *Oxford,* n.d.) which means skill or craft (Shipley, 1984). *Techne* evolved into the English word *technology* and in 1709 was defined as "a Description of Arts, especially the Mechanical" (Phillips, 1709, n.p.). Throughout time, the meaning of *technology* has changed based on advances in society. The *Oxford English Dictionary Online* defines technology in several ways:

1 a. A discourse or treatise on an art or arts; the scientific study of the practical or industrial arts

1 b. Practical arts collectively

1 c. A particular practical or industrial art

1 d. **high-technology** applied *attrib.* to a firm, industry, etc., that produces or utilizes highly advanced an specialized technology, or to the products of such a firm (Technology, *Oxford,* p 1.)

All of the above definitions from *The Oxford English Dictionary Online* (OED), in addition to the many others found in the same source, illustrate the evolving nature of the word *technology*.

The *Britannica Concise Encyclopedia Online* takes the OED's definition and relates it to a more widely-accepted definition of *technology* today. Britannica defines *technology* as "application of knowledge to the practical aims of human life or to changing and manipulating the human environment" (Technology, *Britannica,* par. 1). The entry in the online encyclopedia goes on to explain that *technology* includes various tools, techniques and power sources that make life easier. In science, the encyclopedia states, "Whereas science is concerned with how and why things happen, *technology* focuses on making things happen" (Technology, *Britannica*, par. 2).

One additional definition of *technology* examines the Greek roots of the word more closely. Merritt states that the term comes from the "Greek words *tekhne,* which refers to an art or craft, and *logia* meaning an area of study; thus technology means, literally, the study, or science, of crafting" (Merritt, 2005, par. 1). For the purpose of this study, technology encompasses the machinery used in educational settings. Technologies

include computers, DVD players, CD players and printers. The programs that are run on computers are technology applications. This includes word processing programs, computer games, and WebQuests. These definitions provide a background for a discussion of educational technology and the current use of technologies and technology applications in today's classrooms.

Educational Technology

Educational technology has evolved greatly, the same as education itself has evolved. Just like the general population, the educational population gravitates towards new technologies. In her book, *Book Ends: The changing media environment of American classrooms,* Margaret Cassidy (2004) reflects upon the various educational technologies that abounded throughout the 20th century:

> Film was so vast in 'its possibilities for the instruction…of humanity that did it not already exist we should, if we possess enough imagination, pray for its invention.' Once fully understood, films would 'no doubt, be considered as necessary a part of school equipment as are textbooks, maps, charts, and blackboards,' Radio was described as 'the greatest implement of democracy yet given to mankind,' sure to raise the human mind 'to an entirely new level of precision and efficiency.' Television was hailed as 'the power tool of education,' 'the greatest vital force in modern education,' and 'the most exciting educational voyage since our nation embarked on the universal education of its citizens.' Computer-assisted instruction would provide 'a much broader learning experience than other mass

> communications instructional media'; it was predicted to 'march relentlessly into our educational lives.' (p. 2-3)

Cassidy's summary of educational technologies in the 20th century provides a brief glimpse of how technology has progressed in classrooms. Today, the term educational technology covers various technologies being used by learners and teachers in the classrooms and including everything from computers being used for word processing to the creation of WebQuests. This examination of the transformation of the term 'technology' and how education has evolved with the incorporation of technologies illustrates the changing nature of technology and its impact on education and schools.

Technology Usage in Schools

An examination of the statistics of computer and Internet use in schools today provides a picture of the inclusion of technology in classrooms. In a report published in 2006, DeBell and Chapman examined the use of computers and Internet by children in America in 2003, ages 3 through 12th grade. Approximately 91% (53 million) of children between the ages of 3 through grade 12 use computers, and 59% (35 million) use the Internet (DeBell & Chapman, 2006). In a 2007 Pew Study of Parents and Teen Internet Usage, 72% of teenagers surveyed reported having their own personal desktop computer and 25% reported having a personal laptop computer (MacGill, 2007). Schools provide computer and Internet access to many students who are unable to access these technologies at home (DeBell & Chapman, 2006). The number of students using computers at schools increased from 70% in 1997 to 83% in 2003 (Snyder & Tan, 2005). Additionally, Internet access in classrooms also rose from 51% in 1998 to 93% in 2003 (Snyder & Tan, 2005). Teachers are using these technologies for word processing,

creating spreadsheets, Internet research, practicing drills, and solving problems in their classrooms (Smerdon & Cronen, 2000).

The United States Department of Education approved a National Education Technology Plan in 2004. This plan was put into place because "the technology that has so dramatically changed the world outside our schools is now changing the learning and teaching environment within them…. As these encouraging trends develop and expand over the next decade, facilitated and supported by our ongoing investment in educational technology," research needs to be done to ensure that the educational technology being used in schools is appropriate and ensures that students are learning (U.S. Department of Education, 2004, p. 3).

Technology is extremely prevalent in schools and students' lives and needs to be examined to ensure that students are not only benefiting from the inclusion of technology but also that the technologies being used in schools are not hindering student learning.

Research on Educational Technology

Prior to the 1990s, research about educational technology was limited in scope and purpose. Roblyer and Knezek (2003) examined research from this time period and determined that research on educational technology fell into several categories. The first category of research was media comparison, which compared a technology to a teaching method that did not use technology. The second category of research in educational technology took a behavioral approach. This research looked at the behaviors of learners when interacting with technology; however, little research was done to see the effects of the interaction with the technologies. The final category focused on meta-analysis of current research where the authors looked for themes in other technology research, which

consisted mostly of media comparison studies and behaviorist studies (Roblyer & Knezek, 2003).

As the 1980s came to a close, there was a two-prong attack against the types of research done that focused on educational technology. One prong of the attack focused on the idea that technology is just a tool, and therefore should not be the center of research. Instead, learning and outcomes should be where researchers focus their attentions, rather than the actual technology. The other prong of the attack was against the media comparison aspect of research. Rather than examining whether the technologies are better than traditional teaching or another technology, the research should instead focus on the impact of scaffolding information for learners so that they are able to learn more information, not just about the technology (Roblyer & Knezek, 2003).

These attacks caused the educational technology research community to begin to re-evaluate the research they were doing, causing a shift from the research of the past to current trends in educational technology research. Research about educational technology is becoming more important as policy makers "are demanding evidence that their investments in educational technology have been worthwhile" (Pollard & Pollard, 2004-2005, p. 146). Several leading scholars in the area of educational technology have different ideas of what new research and scholarship in the area of technology should look like in order to answer the call of policy makers and the public about educational technology. The research calls from Roblyer and Knezek (2004-2005); Bull, Knezek, Roblyer, Schrum and Thompson (2005); and Haertel and Means (2003) are discussed below.

Roblyer and Knezek (2003) recently called for a national research agenda that focuses the current and future studies of educational technology. This technology agenda centers on the rationale for technology use and has four major areas for study. The four major areas for study are examining the advantages of technologies, improving the implementation of methods for educational technologies, exploring the impact on societal goals, and shaping the future of educational technology (Roblyer & Knezek, 2003). Each area appears at first look to be a new and more valid way of researching educational technology; however, there are also some flaws in Roblyer and Knezek's thinking.

Examining the advantages of educational technologies is the first area focused on by Roblyer and Knezek (2003). This area calls for research that focuses on the technologies and the idea that they are better than traditional teaching. This approach to educational technology research however is very similar to past media comparison research. Instead of looking at how the technology can be used to help student learning, Roblyer and Knezek suggest that the research focus on proving the advantages of the technology.

The second area for study is improving the implementation methods for educational technologies. This research examines the methods needed to better implement current and future technology into classrooms (Roblyer & Knezek, 2003). This approach to research is more valid than Roblyer and Knezek's (2003) first idea; however, there are several flaws in researching improvement of implementation methods. First, there is no research called for to make sure that the method being implemented is a valid or useful technology. The process of simply looking for ways to improve implementation takes for granted that the technologies are strong educational tools.

Second, the actual methodology for this type of research would have teachers using methods that are not the most appropriate so that the method can be studied. On the surface, improved implementation methods appear to be a sound research method, but the methodology for collecting data and the assumption that the technology is useful flaws the idea.

The third area for study that Roblyer and Knezek (2003) called for is exploring the impact that educational technologies have on societal goals. This is a very important area of research that does need to be studied. After identifying the societal goals, it is important to ensure that what is happening in schools and classrooms with technology align with the goals in place. This research would impact the funding for not only technology, but all aspects of education. Researchers examining the impact of technology would need to report both positive and negative findings, which sometimes get buried in the bureaucratic system of funding for research.

The final area for study is research that shapes the future of educational technology. In theory, the three other types of research would inform this final area of study. Disparities between studies about implementation methods and advantages of technologies would provide the opportunity for future research, if needed (Roblyer & Knezek, 2003).

Bull et al. (2005) have put forth a different call for future educational technology research. They have a three-prong call for research which includes teacher beliefs about technology, teacher practices with technology, and student learning outcomes in using technology. Each of these prongs can be used individually or in combination in proposed research (Bull et al., 2005).

Research that examines teachers' perceptions and beliefs about technology are currently being conducted throughout the country. By examining teachers' beliefs, researchers are able to see why different technologies are used in various classrooms, the beliefs the teacher has about the purpose of the technologies, and the beliefs teachers have about what students are able to gain from using technologies in the classroom. This type of research is mostly qualitative in nature and requires teachers to reflect on what they believe about their teaching and why they choose to incorporate technology into their learning. This type of research will explore not only teachers who use technologies, but also teachers who do not use technology in their teaching, which is valuable information (Bull et al., 2005).

Similarly, Bull et al. (2005) call for research that looks at current teacher practices with technologies. This type of research will focus specifically on teachers who are currently using technology as a part of their teaching practice. Researchers will be able to look at how teachers incorporate technology into their teaching practices. Additionally, by examining the practices of teachers using technologies, researchers will be able to see the educational purposes that teachers see various technologies serving. Research that looks at teachers' current practices with technologies coincides with the research also being conducted that examines teachers' beliefs about technology.

Another type of research that Bull et al. (2005) call for is research that focuses on student learning outcomes in regards to technology. This kind of research will make the most sense to politicians and school board members who want to see if the funding they are using on technology in schools is truly affecting student learning. Both quantitative and qualitative data will be used in this type of research to ensure that the data illustrates

not only the amount of impact technology has on student learning, but also the quality of the impact on student learning.

All three types of research that Bull et al. (2005) advocate for allow for the research to answer multiple questions or just have an in-depth focus on one aspect. This proposed plan for research allows for technology to be examined as a tool for teaching which provides scaffolding for student learning in the classroom. Learners are the main focus of this research, not the technology itself.

Haertel and Means (2003) take a different approach to educational technology research from Roblyer and Knezek (2003) and Bull et al. (2005). Instead of identifying specific areas for study, Haertel and Means (2003) focus on the "how" of future educational technology research. Haertel and Means's (2003) call for research is more scientifically rigorous than current research in the educational technology field and is based upon research being done in other fields of study, specifically, the sciences.

In their suggestion for a change in educational technology research methodology, Haertel and Means (2003) state that studies need to be more scientific; they suggest that studies be long-term and use large samples. This research would need to take place over an extended period of time so that researchers could look at long-term effects of technology. Additionally, larger study populations would be needed so that participant withdrawal would not affect the data.

With the increase in study participants, there is a need to cluster studies into geographic areas that are more manageable for data collection. The studies should be either experimental or quasi-experimental in nature. This would require some participants in the research to use technologies in different ways, at different times, or not

at all. Planning is essential for Haertel and Means's research methodology to work, and if done properly, these long-term, experimental studies should have a high level of generalizablity (2003).

The above are some of the essential elements in Haertel and Means's call for a change in the methodology of educational technology research. However, they do not focus on what aspect of technology should be studied. This lack of attention to the content of technology research allows for future researchers to take the methodological model set forth and apply it to almost any research question. However, this lack of specificity in educational technology research sometimes causes criticism of not only the research being conducted, but also about the technologies themselves.

These calls for research from Haertel and Means (2003), Bull et al. (2005), and Roblyer and Knezek (2003) provide the groundwork for future research focused on technology. This research needs to use a multitude of data collection and data analysis techniques (both quantitative and qualitative). Additionally, research should focus on implementation of educational technologies and how to prepare teachers to use these educational technologies. Finally, research that is easily replicable should be conducted so that the data can be generalized beyond the initial study.

This study responds directly to the above calls for research. Multiple data collection methods and data analysis techniques, which are described in chapter three, are used. Furthermore, this research study focuses on classroom implementation of WebQuests and how student learning is affected by this technology application. Finally, this study responds directly to the call for studies which are replicable and generalizable. This study is designed so that it can be replicated with any WebQuest or other technology

application. In order to create valid, reputable research studies, it is crucial to understand the criticism of educational technology and the research being done in regards to educational technology.

Criticism of Educational Technology

While there is a great deal of literature published on technology in teacher education, there is also literature that criticizes the use of technology in education. One critic of computers in the schools is Todd Oppenheimer, a journalist who is interested in technology in education. Oppenheimer (1997) discussed the negative impact that computers and technology can have on students when the technology limits children's imaginations and interactions with other people. Banning computers from classrooms is not Oppenheimer's goal; instead he wants the federal spending that is now dedicated to technology in schools to be spent on other educational needs, like books. Oppenheimer's criticism about technology in education is not the only criticism.

Larry Cuban, a professor emeritus of education at Stanford University, is another critic of technology in education. In his book, *Oversold and Underused,* Cuban (2001) looks at how computers are actually being used in schools. Despite the general assumption that increased availability of computers in the classroom leads to increased usage of technology, that is not what always happens.

Prior to writing his book, Cuban published an article that questioned the reality of universities that had access to technology, but used little technology in their teaching. In *High-tech Schools, Low-tech Teaching* (1998), Cuban calls upon techno-reformers to examine their own beliefs about the nature of teaching and conflicting purposes of

schools and their embrace of every technical enhancement that comes along (Cuban 1998).

Although Cuban does make a point about the under-use of technology in the classroom, Willis (1998) refutes Cuban's ideas by pointing out that while 20 years ago technology may have been used effectively in classrooms, "today technology supports a whole range of student-centered learning environments, from collaborative learning to problem-based and anchored instruction" (p. 28). Becker (2000) conducted research and collected data to test Cuban's argument that "computers a medium of instruction and a tool for student learning are largely incompatible with the requirements of teaching" (p. 1). While "in a certain sense Cuban is correct – computers have *not* transformed teaching practices of a majority of teachers" Becker (2000) contends that:

> under the right conditions – where teachers are personally comfortable and at least moderately skilled in using computers themselves, where the schools' daily class schedule permits allocating time for students to use computers as a part of class assignments, where enough equipment is available and convenient to permit computer activities to flow seamlessly alongside other learning tasks, and where teachers' personal philosophies support a student-centered, constructivist pedagogy that incorporates collaborative projects defined partly by student interest – computers are clearly becoming a valuable and well-functioning instructional tool. (p. 29)

Becker's finding that computers are becoming valuable instructional tools can be evaluated when looking specifically at one type of current educational technology: WebQuests.

These criticisms are important to acknowledge when beginning new research into the use and effects of technology on student learning, because researchers need to be able to defend their decisions. Understanding past faults and deficiencies in the implementation of technology in the classrooms allows for teachers to have a better grasp of how to effectively integrate technology into their teaching. When new technologies are introduced into education, research needs to be done to assure critics that these technologies are serving an important role in the educational process. Empirical research that focuses on student learning and technologies, specifically WebQuests, will provide evidence as to the effectiveness of the technologies to critics and supporters alike. The implementation of WebQuests over the past 15 years has been overlooked by educational researchers and critics, and research needs to be done about the impact of WebQuests on student learning to provide evidence in regards to the effectiveness of WebQuests.

WebQuests

In 1995, Dodge and March introduced WebQuests to the educational community. Dodge's article, *WebQuests: A technique for Internet-based learning* (1995), allowed educators to see how the Internet could be used in classrooms for inquiry-based teaching and learning. WebQuests were defined as "an inquiry-orientated activity in which some or all of the information that learners interact with comes from resources on the Internet" (Dodge, 1995, p.10). Yoder (1999) explained that in a typical WebQuest, "students were presented a scenario and a task, usually a problem to solve or a project to complete. The

students were given Internet resources and asked to analyze and synthesize the information and come up with their own creative solutions" (p. 1). This explanation of WebQuests, along with the implementation by many teachers of WebQuests in their classrooms, often falls short of the true purpose and intended learning outcomes originally designed by Dodge and March (Barack, 2005; Dodge, 2001; March, 2003). True, authentic WebQuests require learners to take newly-acquired information and transform the information into authentic learning. Simply taking information from websites and putting the same information into a project does not allow the learner to transform the information into knowledge. March points out that "getting the information - the 'learning input' – is the easy part. The WebQuest gets trickier and more interesting in the next part, in which transformative learning takes place and teachers and students can realize – or fail to realize – the potential of a WebQuest" (2003, p. 42). WebQuests should inspire students to seek themes among the information gathered from website and then create projects and products that contribute to the real world of learning and allow students to reflect on their own metacognitive processes (Dodge, 2001; March, 2003).

Components of WebQuests

WebQuests have six basic building blocks that include an introduction, a task, information sources, the process, guidance, and conclusion. These six building blocks are common to all WebQuests and serve specific purposes to ensure that transformative learning occurs. Dodge (1995; 1997) describes the six basic parts of a WebQuest:

1. An **introduction** that sets the stage and provides some background information.

2. A **task** that is doable and interesting.
3. A set of **information sources** needed to complete the task. Many (though not necessarily all) of the resources are embedded in the WebQuest document itself as anchors pointing to information on the World Wide Web. Information sources might include web documents, experts available via e-mail or real time conferencing, searchable databases on the net, and books and other documents physically available in the learner's setting. Because pointers to resources are included, the learner is not left to wander through web space completely adrift.
4. A description of the **process** the learners should go through in accomplishing the task. The process should be broken out into clearly described steps.
5. Some **guidance** [resources] on how to organize the information acquired. This can take the form of guiding questions, or directions such as timelines, concept maps or cause and effect diagrams…
6. A **conclusion** that brings closure to the quest, reminds the learners what they've learned, and perhaps encourages them to extend the experience into other domains. (Dodge, 1995, p. 10; 1997, p. 2)

In addition to the six basic components, WebQuests also have several additional attributes. One such attribute is that WebQuests are usually a group activity. Individual WebQuests are not unknown, but not common. Additionally, WebQuests usually have motivational elements added to the basic components of the WebQuest. Motivational

elements, such as giving specific roles to the learners or providing a situation or scenario to the learners, enhance WebQuests and make the learning process more interesting. Finally, WebQuests can be made to be either for one specific discipline or for several disciplines together (Dodge 1995; 1997). Scaffolding is another attribute that WebQuests have.

Scaffolding in WebQuests allows for learners to stretch and learn in ways they are not traditionally required (Dodge, 2001). March (2003) references cognitive science researchers like Bransford (1999) when discussing the advantages to scaffolding learning for students. March (2003) points out that "research in cognitive psychology tells us that if we want novices to perform at more expert levels, we need to examine how experts go about their work and then prompt novices through a similar process," and that "scaffolding positively affects student achievement" (p. 42). Scaffolding creates a "temporary framework to support student performance beyond their capacities" while completing a WebQuest (March, 2003, p. 42). WebQuests allow for students to have a structure to their learning that allows learners to "act more skilled than they really are" and allows for the "bar of what students can produce to be raised" (Dodge, 2001, p. 58). Scaffolding learning allows for learners to try new approaches to learning with the help needed to succeed in these attempts.

These attributes (being group oriented, including motivational activities, single or interdisciplinary focus and scaffolding) in addition to the six basic components (introduction, task, information sources, process, guidance and conclusion) allow for WebQuests to be written at two levels, short-term and long-term.

Two Types of WebQuests

Short-term WebQuests usually last one to three class periods. The instructional goals of a short-term WebQuest typically include knowledge acquisition and integration. Learners ideally will deal with a large amount of information and be able to make sense of the information (Dodge, 1995; 1997).

Long-term WebQuests can last anywhere from one week to a month. Instructional goals of long-term WebQuests include knowledge acquisition and integration, and then require the learner to then extend and refine the knowledge. Upon completion of a long-term WebQuest, learners not only deal with a large amount of information but also make sense of the information by transforming it. Learners create products that others can learn from and that illustrate their understanding of the material (Dodge, 1995; 1997). Whether short-term or long-term, WebQuests are designed to enable students to acquire knowledge and then integrate and transform the acquired knowledge into new knowledge.

Uses of WebQuests

WebQuests can be used for several different instructional purposes in the classroom while helping students to acquire, and transform knowledge. These instructional methods include using constructivist learning and high-level, critical thinking in the classroom.

Kundu and Bain (2006) describe how WebQuests can be used to facilitate learning in a constructivist manner. While much of teaching can focus simply on the transfer of knowledge from teachers to students, WebQuests enable learners to take an active role in their learning. Constructivist learning methods allow for learning to be an

"organic process" in which "meaningful learning occurs through reflection and resolution of cognitive conflict" (Kundu & Bain, 2006, p. 10). Additionally, constructivist methods allow for students to have multiple solutions, think reflectively, and make authentic connections between learning and the real world (Kundu & Bain, 2006). These descriptors of constructivist learning methods are aligned with the purpose of WebQuests since "WebQuests themselves are authentic" and "participants work cooperatively and collaboratively to produce knowledge" (Kundu & Bain, 2006, p. 10). Constructive learning is not the only instructional purpose that WebQuests can serve.

Another instructional purpose that WebQuests allow for is high level, critical thinking. Vidoni and Maddux (2002) cite one of the foremost theorists and practitioners, Richard Paul's definition of critical thinking as:

> (1) Disciplined, self-directed thinking which exemplifies the perfections of thinking appropriate to a particular mode or domain of thinking. (2) Thinking that displays mastery of intellectual skills and abilities. (3) The art of thinking about your thinking while you are thinking in order to make your thinking better: more clear, more accurate, or more defensible. (Paul, 1995 in Vidoni & Maddux, 2002, p. 104).

Based upon this definition of critical thinking, Vidoni and Maddux (2002) contend that WebQuests provide students with "an opportunity to put critical thinking skills to use" (p. 108). Critical thinking occurs during a WebQuest because students are able to contextualize learning, form their own opinions about material, interpret primary source material, and pursue individual interests within certain boundaries (Vidoni and Maddux, 2002). WebQuests foster higher-order thinking, because they are able to build on prior

knowledge which enables students to think at a higher level. VanFossen (2004) pointed out that "while the teacher determines the task, students remain in control of how the tasks are accomplished and how the outcomes take shape" (p. 16). Giving students control over their learning enables them to think critically about the subject and information as well as construct their own learning experience.

WebQuests are used in many classrooms, at many levels, and for different reasons. There has been an abundance of research about WebQuests since their inception in 1995 by Dodge and March, but no research published about student learning and WebQuests.

WebQuest Research

An ERIC search, conducted in December 2007, using keywords "WebQuest," elicited 96 hits. A Google Scholar search at the same time presented 3,800 hits for "WebQuest," and a Google search for "WebQuest" web pages had 269,000 hits. These numbers illustrate not only the ubiquitousness of WebQuests, but also the large number of writings that are published and posted about WebQuests. However, a closer examination of several of these publications illustrates the lack of depth of research being done on WebQuests and their impact on student learning.

WebQuests were used for inquiry-based learning in MacGregor and Lou's (2004) research. Using results from a multiple choice pretest prior to the completion of a WebQuest, the researchers found that providing instructional scaffolding to support student learning while completing a WebQuest "supported students as they were engaged in learner-centered resource-based learning" (MacGregor & Lou, 2004-2005, p. 172). This mixed-methods research study also found that teachers need to be cognizant of how

WebQuests are designed to ensure that students are able to easily navigate the WebQuest (MacGregor & Lou, 2004-2005).

In a small-scale, qualitative study, Orme and Monroe (2005) examined the discourse patterns of students while they completed a mathematics based WebQuest. The researchers audio-taped the interactions of students while they completed a WebQuest; the tapes were then examined for patterns of discourse among the students. In this study, WebQuests were simply a tool being used by the researchers to examine discourse among participants, and the researchers found that WebQuests are useful in generating discussions (Orme and Monroe, 2005). In this study, WebQuests were used as a platform for research on discourse instead of research specifically focused on WebQuests

In 2003, Lipscomb began with an examination of the structure of WebQuests and then discussed how WebQuests are an appropriate tool for students in the middle grades. Lipscomb (2003) used two eighth-grade classes to examine the "nuts and bolts" of how teachers use WebQuests. In this small-scale qualitative study, Lipscomb does not ask any researchable questions, but instead provides his opinions on the applicability of WebQuests. Lipscomb's article is one example of the articles written about teachers' thoughts and perceptions of WebQuests and their usefulness in the classroom. Descriptive articles are not the only ones published about perceptions of WebQuests.

There are many examples of empirical research on teachers and learners perceptions of WebQuests. After describing the constructs of WebQuests, Zheng, Stucky, McAlack, Menchana and Stoddart (2005) then describe research focusing on (1) the difference between learners' perceptions of WebQuests and the intended purpose of the WebQuest author, and (2) the comparison of the understanding of learners who create

their own WebQuest and those learners who had never created their own. The 207 participants in this quantitative study were college students. This sample influences the generalizablity of the findings that there is no difference between the perceptions and experiences of the learners with regards to WebQuests in this study because the students were college level.

Perkins and McKnight (2005) examined teachers' attitudes about WebQuests as a teaching tool. A survey was used in this large-scale quantitative study to assess the concerns that teachers had about implementing WebQuests in their classrooms. Teachers who reported use of WebQuests in the classroom were more concerned about what more they can do with WebQuests in their classrooms, in comparison to teachers who had no experience with WebQuests reported concerns about learning about and using WebQuests. The findings of this study are predictable based on research about other types of technologies in the classrooms.

In another study, McGlinn and McGlinn (2004) reported that the results of their research "suggest that the WebQuest was an effective tool for increasing student enjoyment and application of literacy skills while studying social studies materials at the secondary level" (p. 18). The 70 students in this quantitative study reported that they "enjoyed the WebQuest more than the text-based unit" and also had "a higher sense of competency, personal control of their learning, and effective collaborations of the WebQuest than the text-based unit" (McGlinn & McGlinn 2004, p. 15).

VanFossen (2005) provided another example of research focused on perceptions of WebQuests by students and teachers. Using quantitative methods, Van Fossen (2005) collected data from teachers and students after the 32 teachers had participated in a

summer institute that required the implementation of WebQuests created during the institute. The results centered on the aspects of WebQuests that the teachers and students like most and least. VanFossen concluded that "simply implementing the WebQuest model does not necessarily ensure success with all students, and this is especially true with poorly designed, or ill-conceived WebQuests" (p. 29).

The above examples illustrate the lack of depth of research on WebQuests in the area of student learning. The research that has been published focuses mostly on perceptions and does not look at student learning. Student and teacher perceptions do not provide evidence for the impact WebQuests have on student learning. The lack of empirical research on student learning and WebQuests exemplifies the need for such research to be done. Research needs to be grounded in a theoretical framework. For this study, constructivism, cognitive science, and multimedia learning theory provide this framework.

Theoretical Framework

The theoretical framework for this study combines the fields of constructivism and cognitive science together to define student learning. Each of these areas is described below to provide background information for the understanding of what student learning is in terms of this study. An explanation of how each of the areas combine together for a better understanding of student learning follows the individual descriptions.

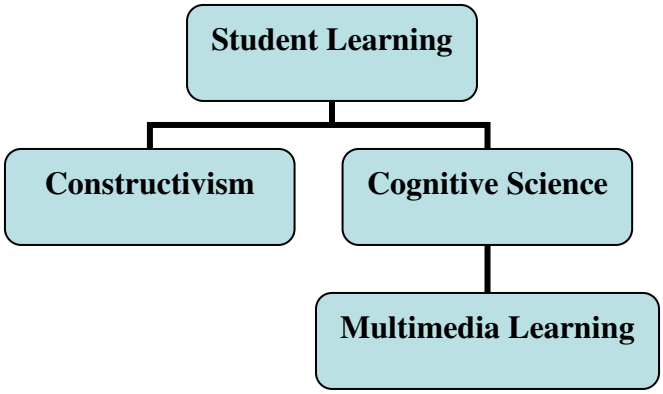

Figure 1: Theoretical Components of Student Learning

Constructivism

Constructivism became a popular educational term in the early 1990s despite the fact that the theoretical origins of it can be traced to the early 20th century (Maddux & Cummings, 1999; Shapiro, 2003). Constructivist learning theory "is based on the now commonplace idea that knowledge is actively constructed by the learner" (Prawat & Floden, 1994, p. 37). Constructivism is a divergent assumption from positivist theory of learning in which there is a search for "truth" and a singular "reality" for all learners. Instead, constructivism allows learners to construct their own truths of knowledge from social and personal experiences (Doolittle & Hicks, 2003; Bednar, Cunningham, Duffy & Perry, 1992). Learners are able to use their own individual interpretations of experiences and interactions to create knowledge, instead of just having knowledge transferred to them (Cunningham, 1992). WebQuests allow for learners to "activate…prior knowledge

and create a personal curiosity that inspires investigation and brings about a more robust understanding of the material" which is the part of constructivism (March, 2003, p. 44).

Philosophical Tenets of Constructivism

There are four main philosophical tenets of constructivism that Doolittle and Hicks (2003) summarized:

> Tenet 1: Knowledge is not passively accumulated, but rather, is the result of active cognizing by the individual.
>
> Tenet 2: Cognition is an adaptive process that functions to make an individual's cognition and behavior more viable given a particular environment or goal.
>
> Tenet 3: Cognition organizes and makes sense of one's experience, and is not a process to render an accurate representation of an external reality.
>
> Tenet 4: Knowing has its roots in both biological/neurological construction and in social, cultural, and language-based interactions. (p. 76-77)

These four tenets emphasize the assumptions of constructivism which include the active role learners' play in the construction of knowledge; the importance of social and individual experiences in learning; and the idea that individuals' representation of reality may vary (Doolittle & Hicks, 2003). The four tenets described above are useful in determining the similarities and differences of the three categories of constructivism. By attaching the relevant tenets to one or more of the three categories of constructivism, overlaps between the categories can be better understood.

Three Categories of Constructivism

Experts in the field of constructivism agree that there are three different categories or types of constructivism (Doolittle & Hicks, 2003; Prawat & Floden, 1994). These three categories include: cognitive constructivism, radical constructivism, and social constructivism. The four philosophical tenets of constructivism (described above) are present in each of the categories in varying degrees, thus helping to make the differences between categories better defined. Each category of constructivism is described below.

Cognitive Constructivism. Cognitive constructivism contends that there is an external reality that learners are able to come to know. Reality is independent from the beliefs and thoughts of the learners and is based upon objectivism and metaphysical reality (Doolittle & Hicks, 2003). Cognitive constructivism recognizes that there is social interaction between learners while knowledge is being constructed; however, this interaction has little to do with the knowledge constructed, because reality is separate from individual learners. Knowledge is constructed when learners are able to identify correct and 'truthful' answers from information provided by teachers (Doolittle & Hicks, 2003).

Only two of the philosophical tenets discussed earlier apply to cognitive constructivism. The first tenet (knowledge is not passive, but instead require learners to actively cognition in learning) and the second tenet (cognition is adaptive depending on the environment and end goal of learning) are applicable to cognitive constructivism (Doolittle & Hicks, 2003).

Radical Constructivism. By far, the most extreme category of constructivism is radical constructivism. Ernst von Glasersfeld, who comes from the a scientific

background, is the main authority on radical constructivism. Von Glasersfeld, and thus the category of radical constructivism, contends that there may be a reality, but it is not knowable to individuals. Instead, individuals create their own version of reality based upon their experiences in the world (Doolittle & Hicks, 2003; Philips, 1995; 2000; Prawat and Floden, 1994; Shapiro, 2003). Radical constructivism asserts that there is no common reality; instead, individuals must actively construct their own knowledge. Knowledge is based upon individual experiences and the cognition of these experiences (Doolittle & Hicks, 2003; Howe & Berv, 2000; McCarty & Schwandt, 2000; Prawat & Floden, 1994). Additionally, students are thought to learn through an internal reorganization of knowledge and are able to gain more knowledge and examine material more closely during each level of internal reorganization (Prawat & Floden, 1994).

The philosophical tenets that are present in radical constructivism are the first three tenets listed above. Like the other categories, knowledge is not passive; instead it is the individual actively cognizing. Cognition is also adaptive in radical constructivism, because the knowledge that is constructed depends upon the goals of the learner. Also, similarly to social constructivism, in radical constructivism, cognition is about organizing. However, instead of organizing a variety of individual experiences into one reality, radical constructivism organizes each individual's experiences into knowledge on an individual basis (Doolittle & Hicks, 2003).

Social Constructivism. Social constructivism recognizes that there is a reality; however, individuals do not necessarily know this reality. There are strong connections between social constructivism and John Dewey's work and philosophy (Prawat & Floden, 1994). Since the process and criteria used to evaluate knowledge is a social

product, then depending upon the members of the group deciding upon which knowledge claims are valid, the accepted knowledge can change as group members change (Prawat & Floden, 1994). Instead of searching for correct subject-centered knowledge, social constructivism focuses on student-centered competencies. Knowledge is not one truth; instead it is a compilation of individual experiences. They can vary depending upon who is in the group, what the purpose of the group is, and the environment in which the group exists (Bredo, 2000; Doolittle & Hicks, 2003; Philips, 1995; 2000; Prawat & Floden, 1994; Shapiro, 2003).

Social constructivism involves all four of the philosophical tenets described above. Knowledge is active cognizing, tenet one, is applicable because learners must work together to create knowledge. Tenet two, cognition is adaptable, is an essential part of social constructivism because depending on the goal of the group, the knowledge created may be different. Additionally, tenet three, cognition is and organization of experiences is a key component in social constructivism because all participants in the social group have different experiences that they bring to the table. Then, the group must organize everyone's experiences into a consensus. Finally, the last tenet is applicable because knowledge not only comes from neurological and biological sciences, but also takes into account the social context and language used in the groups to construct knowledge (Doolittle & Hicks, 2003).

In constructivist classrooms, teachers attempt to have their students learn by building lessons around big ideas that students then add their point of view to. Constructivist classrooms allow for students to challenge ideas and create personal meaning from interactions with other students and teachers (Brooks & Brooks, 1999). In

the English classroom, constructivism is apparent through the design and implementation of student centered lessons in which students create knowledge through social interactions.

Constructivism provides a lens for examining the learning process, specifically the roles that learners and teachers play in the process. Social constructivism, in which learners learn through doing, is one approach to understanding the process of WebQuests and how learners interact with the technology application. Understanding constructivism and its many approaches is only one part of the theoretical framework used in this study. Constructivist theory implies that learning is an active process by learners and that all learners have their own individual take on the information provided. Knowledge is created by individual learners through social interactions. Specifically, how knowledge is created is explained by exploring the area of cognitive science. The designers of WebQuests intended for groups of students to work together in the completion of the WebQuest (Dodge, 1995; 1997). Therefore, having an understanding of social constructivism and its effects on how students learn is a key theoretical component in this study.

Cognitive Science

The field of cognitive science began in the 1950s to explore the complexity of understanding how humans interact with their environments. Cognitive science employs a multidisciplinary approach to learning. The fields of anthropology, linguistics, philosophy, computer science, neuroscience, and psychology combined together and provided "new experimental tools, methodologies, and ways of postulating theories…for scientists to begin serious study of mental functioning" (Bransford, Brown & Cocking.,

1999, p. 8). With the development of this new field, researchers have been able to focus on the ways in which people learn and know.

One area of research in the field of cognitive science that has been examined is metacognition. Metacognition "refers to people's abilities to predict their performances on various tasks and to monitor their current levels of mastery and understanding" (Bransford et. al., 1999, p. 12). Part of metacognition is understanding the idea that learning is an active process and that people can have control over their own learning.

In addition to active learning, transfer is another important area in the field of cognitive science. Learning and transfer are central to cognitive science. Transfer goes beyond merely memorizing information to understanding the information; it includes a learner's ability to transfer what he or she has learned to new and different situations (Bransford, et al., 1999). The concept of transfer of learning is essential in determining if students are simply memorizing material or actually understanding the material. In order to determine if students are learning material presented in WebQuests, it is essential to see if the material can be transferred beyond the WebQuest. If students understand the material presented in the WebQuest, then they should be able to transfer that knowledge to other situations. This is one way to examine if students learn through the completion of a WebQuest.

Motivation

Another area of focus for the field of cognitive science is motivation. Bransford et al. (1999) state that "motivation affects the amount of time that people are willing to devote to learning" (1999, p. 48). When learners see the usefulness of the task, they are more motivated to learn information. Motivation affects a learner's ability to transfer

knowledge beyond simply memorizing. Motivation is a principle of cognitive science that is a psychological factor of student learning. Motivation is intrinsic in learners depending upon learner beliefs, interests, emotions, and goals (Lambert & McCombs, 1998). Each learner has unique intellectual and physical capabilities which affect his or her level of motivation (McCombs, 1998). When learners are interested in learning and the learning leads to a goal, then motivation is high and learning occurs.

Memory

Memory is a crucial part of the study of cognition and student learning. Memory can be categorized into two different processes: declarative memory and procedural memory. Declarative memory refers to memory of basic facts and events; procedural or nondeclarative memory focuses on skills and other cognitive operations (Bransford et al., 1999). Information is processed in a learner's working memory, formerly referred to short-term memory, where the brain provides temporary storage and processing of information (Baddeley, 1992). The information is then stored in long-term memory and can be called back into the working memory when needed (Wittrock, 1990).

Cognitive Load

Cognitive load theory is "concerned with the manner in which cognitive resources are focused and used during learning and problem solving" (Chandler & Sweller, 1991, p. 294). The manner in which information is presented to learners can influence the amount of information that is understood and processed. Cognitive load theory suggests that "information should be presented in ways that do not impose a heavy extraneous cognitive load" (Chandler & Sweller, 1991, p. 295) on the learner. Chandler and Sweller

(1991) conducted six different experiments to evaluate the instructional methods used and their relationship to cognitive load. The findings of the experiments indicated:

> that, in areas where mental integrations are essential in order to make sense of two or more sources of information, conventional instruction should be replaced by integrated instructional formats. In areas where mental integrations are not necessary because of redundant information, neither physical nor mental integration is necessary. Isolation and elimination of redundant sources of information are preferable. (Chandler & Sweller, 1991, p. 330)

When using cognitive load theory to design instruction, Sweller and Chandler (1991) stated that "there can be only one ultimate goal: the generation of new, useful instructional techniques" (p. 351). Instruction using technology has the same goal as stated above, and the advances in instructional technology allow for technology to support learning.

Cognition and Educational Technology

While the inappropriate use of technology in the classroom can hinder learning, effective use of technology can help learners learn. Cognitive theory and cognitive load theory research call for educational technologies to be designed to scaffold thinking and activities (Bransford et al., 1999). There are several ways in which educational technologies can scaffold learning through the use of hypertext and multimedia instruction.

Hypertext "is computer-presented text which contains information organized into a kind of 'semantic net.' Within this network of information, the reader accesses

individual elements, or 'nodes,' through the use of links that are embedded into the text" (Neiderhauser, Reynolds, Salmen & Skolmoski, 2000, p. 237). This 'semantic net' that Neiderhauser et al. (2000) refer to is an example of scaffolding thinking for learners. Hypertext environments allow for learners to understand and learn difficult subject matter because of the scaffolding the hypertext provides (Landow, 2006; McNabb, 2005/2006; Neiderhauser et al., 2000; Robertson, 2006; and Spiro, Feltovich, Jacobson & Coulson, n.d.). Scaffolded learning environments, like hypertext, allow for students to go beyond simple memorization of facts and concepts to higher-level learning goals, like transfer of learned knowledge (Landow, 2006). The learners are able to take knowledge and move from memorization to transfer of knowledge by scaffolding the information from simple strategies to more difficult and more complex strategies.

In multimedia learning, instructional messages present instructional material using words and pictures to promote learning (Mayer, 2002). Multimedia learning incorporates several cognitive processes including "selecting relevant information, organizing that information into coherent representations, and integrations of these representations with existing knowledge" (Moreno & Valdez, 2005, p. 36) which is a type of learning scaffold for the learner. In order to better understand how multimedia learning can be used to examine and understand cognition, it is important to understand multimedia learning theory.

Multimedia Learning

Multimedia learning theory combines the fields of cognitive science and educational technology together to examine how students learn. Multimedia learning is a theory in educational technology that focuses on how learners learn. Mayer, in his book

Multimedia Learning (2001), defined multimedia technology as "devices used to present visual and verbal material" (p. 3) and multimedia learning as "learning from words and pictures" (p. 3). The focus of multimedia theory is on the examination of using senses (auditory and visual) to learn new information or better understand prior knowledge (Mayer, 2001; 2002; Moreno & Valdez, 2005). The combination of auditory and visual components allows for students to have a better understanding of material, because the material is being presented in multiple modes. Having information in multiple modes provides the opportunity for students to approach the information from different vantage points. Additionally, since learners often learn in different ways, multimedia learning allows for different types of learners to learn in the best ways possible for them (Bransford et al., 1999). Multimedia learning theory is important in this study because of the multimedia nature of WebQuests. WebQuests are designed with both visual and auditory components and require learners to process large amounts of information.

Three Cognitive Theory Assumptions to Multimedia Technology

When designing or evaluating multimedia technology, there are three important cognitive theory assumptions that need to be considered. The three assumptions include the dual channel theory, the limited capacity theory, and the active processing theory (Mayer, 2001; 2002; Moreno & Valdez, 2005). Each of these three theories plays an important role in creating effective multimedia technology.

Mayer (2001) describes the dual channel assumption by stating that "humans possess separate information processing channels for visually represented material and auditorily represented material" (p. 46). The difference between the two channels is that one is based on sensory modalities and one is based on presentation modes. Sensory

modality focuses how the information is presented, either through the eyes or the ears. Information presented through the ears includes spoken words and sounds; information presented through the eyes includes text, pictures, video, and animation. Conversely, presentation-modes focus on whether the stimulus is verbal, such as words, or non-verbal, for example pictures, animation, and background sounds (Mayer, 2001; 2002; Moreno & Valdez, 2005). Having two channels allows for information to enter the human information system via one channel and then be converted for processing in the other channel (Bransford et al., 1999). At times, "when learners are able to devote adequate cognitive resources to the task, it is possible for information originally presented to one channel to also be represented in the other channel" (Mayer, 2001, p. 48). Multimedia learning theory combines the auditory and verbal channels together, and the visual and pictorial channels together.

The limited capacity theory assumption follows along with the dual channel theory. Each channel, whether it is the auditory/verbal or visual/pictorial channel, can only input so much information at a time – a cognitive load. There is a limited capacity for each channel in the amount of information that can be absorbed and processed (Mayer, 2001; 2002; Moreno & Valdez, 2005). So, as with the assumption of dual channels, the more channels in which a learner has to use for information absorption, the more that can be inputted before reaching capacity of either channel.

Finally, there is the active processing theory assumption. This theory focuses on what learners do with the information once it is received via the auditory and sensory channels (Mayer, 2001; 2002; Moreno & Valdez, 2005). Mayer (2001) states that "these active cognitive processes include paying attention, organizing information, and

integrating incoming information with other knowledge" (p. 50). The active processing theory assumption can be broken down into three parts: the selection of information, the organization of information, and the integration of information. When the learner selects information, they are deciding what words and images they need to input through either the auditory or visual channel. Once information is selected, the learner then organizes the images and words to help make better sense of what they are learning. Finally, the images and words that have been selected and organized need to be integrated into the new knowledge that the multimedia technology was presenting (Mayer, 2001; 2002; Moreno & Valdez, 2005).

There is a five-step process for learners to process information in multimedia technology theory. The first step is selecting words. When learners select words, they are deciding which words and text are most important to store in the limited capacity auditory channel. The second step is selecting images. Similarly to the first step, the learner must choose which images are essential to input into the visual channel. The third and fourth steps deal with organization of words and images. After selecting the words and images to store, the learner then must organize these images and words into meaningful chunks of information. If the purpose of learning was to simply remember information, the processing of information would stop here. However, if the purpose of learning is to later transfer the information into different and new experiences, there is one last step in the processing series. The final step is integration. After the learners have selected and organized words and images, they then need to integrate the words and images together to get a complete picture of the information presented and to also be able to transfer the information to different situations (Mayer, 2001; 2002; Moreno & Valdez

2005). This step by step process follows along with Bransford et al.'s (1999) suggestion that all learners use different strategies when learning.

Conceptualization of Multimedia Technology

There are three different ways to view multimedia technology: delivery, presentation, and sensory views. The delivery approach to viewing multimedia focuses on the technology used in delivering the multimedia message, such as computers, blackboards, and speakers (Mayer, 2001). For example, if the information is on a computer screen, there are pictures and auditory information for the learner to process.

Mayer (2001) points out that while this view of multimedia is technically the most accurate because the focus is on the actual media, this view is also the most misleading because the "emphasis is on the devices used to present information rather than on how people learn" (p. 6).

The presentation view of multimedia technology is a more learner-centered approach to multimedia technology. The presentation view is focused on the way that the material is presented. This view of multimedia is learner-centered and assumes that "learners are able to use various coding systems to represent knowledge, such as verbal and pictorial knowledge" and is "consistent with a cognitive theory of learning" (Mayer, 2001, p. 6).

The final view of multimedia technology is another learner centered view – the sensory view. This view focuses on using both visual and auditory senses to receive and understand information (Mayer, 2001). When using the computer screen example, if the information is presented as pictures and auditory text, then the learner is using two

different senses to interpret the information presented. These views of multimedia are important when thinking about how to create multimedia technology.

Design of Multimedia Technology

Multimedia technology can be designed in one of two ways, technology-centered or learner-centered. When technology is the center of focus, everything is focused on the technology tools used in presentation of information (Mayer, 2001). For example, in a technology-centered delivery mode, more time would be spent with creating the auditory and visual components rather than seeing if the information being presented via these technology components is learner friendly.

The second design approach in multimedia design is learner-centered. When multimedia technology is created with a leaner-centered approach, consideration is given to how the learner will process the information using both auditory and visual senses. While the technology used in multimedia technology is fun and interesting, it is not always what learners need to help them to learn. The leaner-centered approach "begins with an understanding of how the human mind works and asks 'How can we use multimedia technology as an aid to human cognition'" (Mayer, 2001, p. 10). By examining the way the human mind works, learner-centered multimedia design keeps the learner at the center of how technology can be used to help learners learn. WebQuests which use a learner-centered design keep the learner in the forefront of the learning process and allow for the students to interact with-not just read or listen to-the material presented.

Goals of Multimedia Technology

There are two goals in using multimedia technology in educational circumstances; information acquisition (simple remembering purposes) and knowledge construction (transfer purposes). When the purpose of learning is to add information to the memory - information acquisition - learners are seen as empty vessels which need to be filled with information (Mayer, 2001).

On the other hand, if the purpose is for integration and transfer of information - knowledge construction - then the leaner must understand the information presented and at a later time be able to transfer the original information into a new situation. Depending on the goal, information acquisition or knowledge construction, multimedia learning takes different forms and has different purposes (Mayer, 2001).

The Seven Principles of Multimedia Technology

There are seven principles of multimedia technology. The seven principles include: multimedia; spatial congruency; temporal congruency; coherence; redundancy; modality; and individual difference (Mayer, 2001; 2002). Each principle examines a different aspect of the theory behind multimedia technology and has specific theoretical reasoning. Additionally, these are the principles that can be tested in research studies to see if the multimedia technology allows for simple remembering of information or the more sophisticated transfer of information.

The multimedia principle is the all-encompassing principle that focuses on the idea that dual channel processing assumption is a valid learning theory. Theoretically, the idea that if information is presented in two separate methods, than an individual will be able to comprehend more information since each method focuses on a different

channel. Since multimedia technology is focused on presenting information in two channels, auditory and visual, than the multimedia principle should hold true that learners are able to remember more information and possibly have a greater chance of transferring this information (Mayer, 2001; 2002).

The spatial congruency principle examines the relationship in space between the pictures and text when presented. In theory, the pictures and text must be placed closely together; otherwise, the learner will spend too much time and thought on connecting the pictures with the text. When the text and pictures are closely linked, the leaner has a better chance of connecting the two when recalling the information later. When researched, this principle should hold true; learners who are presented with pictures and text spaced closely together should be able to better remember and transfer this original information to new situations (Mayer, 2001; 2002).

The temporal congruency principle is very similar to the spatial congruency principle. Like the spatial congruency principle, pictures and text need to be spatially close, but the temporal congruency takes it one step further and contends that the pictures and text need to be presented at the same time. For example, in a textbook, the picture that illustrates an idea should be put on the same page as the words describing the idea. Another example would be that in a computer presentation, the auditory words are said at the same time that a visual representation is shown. Theoretically, when pictures and text are presented at the same time, the learner has a better chance of remembering and later transferring this knowledge (Mayer, 2001; 2002).

The coherence principle states that only information relevant to the idea should be presented. Extraneous information that does not specifically add to the understanding of

an idea should not be presented in multimedia technology. In theory, when extraneous information is presented, the learner is unable to focus on the intended message and therefore has difficulties in selecting and organizing information. Ideally, the only information presented on a page or computer screen would be the pictures and text that relate to the information being presented. If this happens, learners would have a better chance at not only remembering the information but relating what they learn to different situations and experiences (Mayer, 2001; 2002).

The redundancy principle focuses on the presentation of textual material. If the redundancy principle is kept in mind, then the information is presented verbally only so that there is not a redundancy of text being heard and read at the same time. The theory is that if a learner is hearing and reading the same information along with a visual representation, the visual channel is being overloaded by having to read instead of just focusing on the picture and hear the text. By only presenting the information verbally, instead of as a visual, learners are better able to remember the information presented and then to later transfer this new knowledge (Mayer, 2001; 2002).

Along with the redundancy principle which states that you should present textual material only through the auditory channel, the modality principle focuses on presentation of material in multiple modes. The modality principle states that information should be presented in multiple modes, so that learners can use both their visual and auditory channels. Theoretically, this principle takes into account the dual channel theory assumption where getting information in two channels is more beneficial for the learners who are then better able to remember and transfer this knowledge at a later time (Mayer, 2001; 2002).

The final principle is the individual differences principle. This principle focuses on the learners who will benefit the most from multimedia technology. Low-level knowledge learners will theoretically learn better from multimedia learning, because they have less prior knowledge to interfere with the accumulation of the new auditory and visual information presented in multimedia messages. This is not to say that high-level learners are not able to learn from multimedia technology, but that low-level learners are able to learn more in this manner (Mayer, 2001; 2002).

These seven principles of multimedia technology and learning present a more in-depth examination of what is conceptualized as multimedia technology and the goals and benefits of using multimedia technology in learning. Learning that incorporates both text and pictures allows for learners to remember more (Levine & Mayer, 1993). Multimedia learning theory provides a portion of a theoretical framework on student learning in which to examine student learning and technology.

Multimedia learning theory provides a backdrop for the in-depth study of student learning and WebQuests. The active processing assumption breaks the research down into manageable parts which can be identified and examined individually and as parts of a whole. Through in-depth probing of students and how they select, organize, and transform information into new knowledge, research can explore how the learning is actually occurring for individual students. This theory will ground the study of how students learn in the active processing assumption of multimedia learning theory.

Student Learning

Through an understanding of constructivism, cognitive science, and multimedia learning theory, one can better understand the concept of student learning as used in this

study. Students are able to actively construct their own understanding through social interaction. The construction of knowledge is individual to each student and allows for multiple viewpoints on the subject. Additionally, the process that each student goes through in the creation of knowledge leads to knowledge that is very specific to the person, yet generalizable to the rest of the learners through social interactions since they all worked together to create the knowledge for each individual.

Technology and Student Learning

Since the beginning of formal education, there have been technologies that have enhanced student learning. Writing implementations are one of the first technologies that were used to help students learn better. Chalk, ink, pencils, paint, and keyboards all have been used throughout time to enhance student learning by allowing students to put down on a surface their thoughts and ideas (Landow, 2006). Another technology that enhances student learning is printed text. When Guttenberg created the printing press, he supplied a way to provide masses of students with book containing the information they wanted to learn (Printing Press, n.d.). Today, digital texts enhance student learning by allowing students to read books that they are unable to get their hands on, to publish their own writing in a public space, and to read what their peers have written (Landow, 2006). These are just some general, broad examples of technologies that enhance student learning.

Advocates for the inclusion of educational technologies often argue that "learning is more effective when multiple senses, modalities or learning styles are employed" (Cassidy, 2004, p. 273). Research in the area of educational technology has mostly focused on the effects of technology on student learning (Zhao, Byers, Pugh & Sheldon,

2000). Studies in the 1970s and 1980s "sought to demonstrate the impact of technologies or software on student learning" (Honey, Culp & Carrigg, 1999, p. 1), specifically, "whether – and to what degree – a particular technology leads to changes in learning outcomes and/or teaching practices" (Zhao,et al. 2000, p. 270). While there are examples of what research on student learning and technology looks like prior to the earlier discussed proposed approaches, there is little literature published using those proposed approaches.

One popular approach to studying the effects of technology on student learning is to compare the technology to traditional instructional methods. Thirunarayanan and Perez-Prado (2000-2001) compared online learning to classroom learning in a course that taught English to speakers of other languages. The study found that there was not a significant difference between traditional classroom instruction and on-line learning for students. The researchers do admit that there is "certainly a need for ongoing research to continuously test the effectiveness of evolving Web-based course delivery technologies" (Thirunarayanan & Perez-Prado, 2001, p. 136). This is just one example of comparative studies of technological to non-technological instruction.

The measurement of attitudes and perceptions of teachers on the impact of technology on student learning is another approach taken by many researchers. Christensen and Knezek (2001) discussed seven instruments for assessing the effective integration of technologies. The development process of the instruments focuses on the motivation, skills, and tools that are essential for effective technology integration into classroom practices. Liu and Johnson (2001) developed and tested a course assessment model based on simple learning principles (establishing learning objectives, collecting

data based on learning experience, and evaluating the data). The model uses both quantitative and qualitative data to assess student learning (Liu and Johnson, 2001). In one study, McGee (2000) used qualitative analysis on e-mails from a new teacher about beliefs and perceptions of why and how technology should and can be used in the classroom to help students learn. The teacher reported that technology was "an invaluable tool in many ways…it provokes enthusiasm from students, facilitates equity and can require that teachers re-think their instructional approaches" (McGee, 2000, p. 205-206). These are just a few examples of different research being done on the effects of technology on student learning.

Comparative studies and perception studies are useful in some contexts; however, research about technologies, technology applications, and student learning needs to become more rigorous to ensure that the assessment used in the evaluation matches the learning outcomes. Often, the same assessment is used for both technology using and non-technology using students in comparative studies with no acknowledgement of the technology used and how that technology differs from traditional instruction. There is no direct way to compare learning that occurs with technology and learning that occurs in non-technology enhanced environments. Additionally, relying solely on the perceptions of teachers and students can lead to inaccurate results when determining the effectiveness of technology and student learning. Instead, current research should begin to focus on the previously discussed calls for research of Bull et al. (2005), Roblyer and Knezek (2003), and Haertel and Means (2003). This type of research should examine the effects of a technology or technology application on student learning. It should be done in a manner

that can provide substantial data on actual student learning in addition to the perceptions that the students and/or teachers have about the learning experience.

WebQuests and Student Learning

Based upon an extensive review of the literature on WebQuests, there is a need for research on WebQuests and student learning, because currently there is a void. There is no published research that has examined whether or not students actually learn while completing a WebQuest. This void presents the opportunity for research to be conducted on the effects WebQuests have on student learning. In order to begin to fill this void, research should be done which uses both qualitative and quantitative data to answer research questions focused on student learning and WebQuests.

Based upon the literature above, the following research questions are raised:

1. Do learners learn the addressed material through the use of WebQuests?
2. How do learners learn with WebQuests?
    a. How does the learner select information while completing the WebQuest?
    b. How does the learner organize the information selected while completing the WebQuest?
    c. How does the learner integrate selected and organized knowledge during the WebQuest for the completion of the final project?

These questions will be answered using the methodology described in the chapter three.

Pilot Study

A pilot study was conducted in order to test the WebQuest, which was created by the researcher, and the various interview and observation protocols. For this pilot study, a WebQuest was used in two ninth-grade English classrooms. Data were collected from

students in order to determine if learning occurs during the completion of the WebQuest and how the students learned the material. Two ninth-grade English teachers agreed to use WebQuests in the completion of a poetry unit with one class each.

After discussing the topic of the WebQuest with the teachers, the researcher created a short-term WebQuest using the prescribed elements of a WebQuest on the poetic terms taught in ninth grade English I (Dodge, 1997; 2004). Teachers were then provided a link to the WebQuest to provide feedback on the material presented and the design itself. Additionally, the researcher worked with the teachers to determine the use of ten questions that had been released from the Department of Instruction from previous English I End of Course exams as the pre- and post-test for the study. The pilot study is described below and helped to inform the final study.

Participants

Fifty students completed both the pre- and post-tests and the WebQuest over a 3 day period during the spring 2007 semester. Two groups of students (a total of five students) were then interviewed to determine if and how they learned about poetry through the completion of the WebQuest.

Results and Conclusions

The quantitative data, pre-test and post-test scores, were analyzed to determine if students learned about poetry through completion of a WebQuest, in response to the first research question. Of the 50 students who completed both the pre-test and the post-test, 36% (n=18) of the students scores increased. However, 22% (n=11) of the students scores stayed the same from the pre-test to the post-test and 42% (n=21) of the students' scores actually went down from taking the pre-test to taking the post-test. The mean

score on the pre-test was 7.9 out of 12 items and the mean score on the post-test was 7.4 items out of 12. That represents a difference of -0.5 on the post-test.

Two sets of interviews were conducted to find out if the students thought they had learned from the completion of the WebQuest and how they were able to learn during the WebQuest. One set of interviews occurred one-on-one between the researcher and an individual student. The other set of interviews occurred with a group of three students. Review of theses data disputed the quantitative data in that all five of the students interviewed believed that they had learned more about poetry through the completion of the WebQuest. One student reported "The WebQuest was very helpful and will be useful when I take my EOC [End of Course Exam] for English." Another student reported that the WebQuest will be useful when she takes the end of course exam, because "the WebQuest made me actually find similes in the songs…instead of just showing me what a simile was." These students self-reported that they were able to learn from completing the WebQuest, which was not evident by simply examining the pre- and post-test data. Of the five students interviewed, four of the students scores went down on the post-test and one student's score increased on the post-test (see Table 1).

Table 1: Difference of Scores for Students Interviewed during Pilot Study

Student	Pre-Test Score	Post-test Score	Difference in Scores
A	9	7	-2
B	7	5	-2
C	8	6	-2
D	8	9	+1
E	11	8	-3

As to how students learned during the WebQuest, all of the students interviewed stated that working in groups was useful. One student commented, "Working in a group helped – when I got stuck, my group members explained it [a literary term] and I was able to get it then…." Working in groups was one way in which the students reported they were able to learn about poetry through the WebQuest. Students also reported that learning about poetry and literary terms in the WebQuest was a new and different approach than how they had been traditionally taught and that the technology used in completion of WebQuests was an advantage.

Based upon both the qualitative and quantitative data gathered during the pilot study portion of this study, it is difficult to judge whether or not WebQuests affect student learning. Despite the decrease in student scores on the post-test from the scores on the pre-test, students reported that they did find WebQuests to be useful in helping to learn about poetry. Students reported that they learned because they were interested in using the technology and also because they were able to work in groups to help each other learn.

Future Study Considerations

Based upon this pilot study, there are several aspects of the study that needed to be altered prior to implementation. One aspect is the format of interviews. Originally, the researcher had planned to interview students individually; however, after talking with several students individually and another set of students as a group, students were more willing to talk about their experiences with the WebQuest in a group setting. Therefore, the researcher planned to use focus groups, instead of individual interviews with the students.

Additionally, the researcher was able to observe one of the classes during the completion of the WebQuest. Based on this observation and the suggestion of the teacher, the researcher planned to create a worksheet for the students to complete during the WebQuest to help them process all of the information. The worksheet with have the students define each of the literary terms and will provide space for the students to write about the literary terms found in the various songs. During observations, several groups of students skipped over the introductory material and then had difficulties later in the WebQuest. Requiring students to complete a worksheet will also ensure that the students read all of the introductory material provided in the WebQuest.

Finally, an open-ended question were added to the student focus group protocol. After having the students complete a transfer activity to gage if they were able to transfer the knowledge gained during the WebQuest to another poem, the researcher will then ask the students if they currently believe that they learned anything from the completion of the WebQuest. This question will allow for students to assess the application of the WebQuest activity beyond the actual WebQuest itself.

Conducting a pilot study was extremely beneficial for this study, because it allowed for several issues to be identified and corrected before the implementation of the final study, such as the need for a worksheet and the switch from individual student interviews to the use of focus groups. Based on the results of the pilot study, the official study was conducted during the fall 2007 semester to answer the following research questions:

1. Do learners learn the addressed material through the use of WebQuests?
2. How do learners learn with WebQuests?

a. How does the learner select information while completing the WebQuest?

b. How does the learner organize the information selected while completing the WebQuest?

c. How does the learner integrate selected and organized knowledge during the WebQuest for the completion of the final project?

CHAPTER THREE: METHODOLOGY

Research Design

There is a dearth of research and literature pertaining to student learning with WebQuests, specifically, the technology application's effect on learners and learning during completion of the activity. With this gap in the research, there is a need to use multimedia learning theory and the active processing assumption to examine in-depth the effect that WebQuests have on the learner and the learner's selection, organization, and integration of information from the inquiry-based project in the English classroom.

This lack of research about if and how learners learn by completing WebQuests creates a need for empirical research to be done in this area to answer the following questions:

1. Do learners learn using WebQuests?
2. How do learners learn with WebQuests?
    a. How does the learner select information while completing the WebQuest?
    b. How does the learner organize the information selected while completing the WebQuest?
    c. How does the learner integrate selected and organized knowledge during the WebQuest for the completion of the final project?

In order to answer the above research questions, it was necessary to look not only at quantitative data, but also at qualitative data. The quantitative data collected in this study begin to provide the answer to the question of if learning occurs with the use of the

technology application, WebQuests. The results of pre- and post-test data from a sample of ninth-grade English students illustrate if the learners learned anything from the completion of the WebQuest. Qualitative data collected in this study explores the issue of how learners are learning through the WebQuest. A small sample of students participated in focus groups to probe how learning occurred while the WebQuest was completed. Combining these two different methodological approaches allowed for the researcher to answer not only the "if," but also the "how" of student learning and WebQuests.

Thus, a mixed-methods approach was utilized to answer the above research questions. Mixed-methods research studies are studies which use both qualitative and quantitative data collection and analysis (Greene, 1989; Teddlie & Tashakkori, 2003). According to Teddlie and Tashakkori (2003) three specific strengths to using mixed-methods research which apply to this study are:

> Mixed-methods research can answer research questions that other methodologies cannot.
>
> Mixed-methods research provides better (stronger) inferences.
>
> Mixed-methods provide the opportunity for presenting a greater diversity of divergent views. (p. 14-15)

The research questions that frame this study (detailed above) examine not only the idea of if learning occurs through the use of WebQuests, but additionally, how learners learn with technology. This dual-level questioning cannot be answered by looking at only quantitative or only qualitative data; instead, a combination of both is needed to answer the research questions. Additionally, mixed-methods research provides not only

triangulation of data by examining research questions from two different points, but also development and expansion of the complex ideas that arise from data collection and analysis (Greene, 1989; Teddlie & Tashakkori, 2003). By using quantitative data (numbers which are then statistically analyzed) and qualitative data (in which narratives are analyzed using qualitative techniques) the researcher will be able to not only answer the question of whether learning occurs using WebQuests, but also how the learners are learning.

Participants

The population for this study consisted of students enrolled in the English classes of their 9th grade English teachers who used a WebQuest on poetic literary terms. For this study, the sample, which is a convenience cluster sample (Trochim, 2001), consisted of ninth-grade students who were enrolled in English I at Southern High School (pseudonym) during the fall of 2007. The students, enrolled in nine sections of English I each taught by one of three teachers, completed the same WebQuest focusing on the different literary elements in poetry. The students in the nine sections had not done WebQuests previously. None of the classes had gone to the computer lab previously during the current semester in the English I course, so this was the first time as a class that the students were in the computer lab using computers. Additionally, many of the students appeared to be comfortable using the computers during the WebQuest, so despite the face that the English I teachers had not taken their classes to the computer lab, the students were all comfortable using the computer from either personal use or prior school experiences.

Only the students who were present for all three portions of the study are included in the sample. Table 2 (see below) lists the number of students in each of the three classes for each of the three teachers. The numbers in parentheses for each class are the total number of students enrolled in each of the classes. The first number in each box is the number of students who completed the pre-test, WebQuest and post-test sequence and make up the sample for this study. Three different teachers were used in this study to strengthen the study's ability to generalize results. By having multiple teachers in the study, data collected were not limited to reflecting a specific teacher or a teacher's influence on the students.

Table 2: Number of Students by Teacher and Class who participated in Study

	Class 1 Enrolled	Class 1 Participants	Class 2* Enrolled	Class 2* Participants	Class 3 Enrolled	Class 3 Participants
Mrs. Buc	14	11	37	33	24	22
Ms. Navigator	23	18	27	27	28	27
Mr. Saber	25	23	29	28	25	22

Note: * Advanced level class

Southern High School is a large public high school located in the southeastern portion of the United States. Currently, Southern is one of the five high schools in the county with 1,781 students enrolled. Southern currently uses a block schedule, with classes running ninety minutes for a semester. All ninth-graders at Southern are students enrolled in one of three academies in the school. The ninth grade academies at Southern were implemented to help create a small learning community environment in a large high school. Each academy has 120-130 students enrolled with four core teachers who each teach one subject area. The three academies enable teachers to have close contact with a

small number of students. The academy environment also allows for teachers to work closely together to structure and plan instruction for the students. The three teachers participating in this study are the English teachers within each of the academies; they teach only ninth-grade English.

Three teachers, along with their English I classes, agreed to participate in this study after being contacted by e-mail and also a visit from the researcher to describe the study in detail. Mrs. Buc (a pseudonym) has been teaching at Southern for four years as a teacher in one of the small academies. Currently, Mrs. Buc is the team leader for ninth-grade English. Ms. Navigator (a pseudonym) is currently in her third year of teaching at Southern. Ms. Navigator teaches within one of the three small learning academies at Southern. Finally, Mr. Saber (a pseudonym) is currently in his second year of teaching at Southern. All three teachers agreed to have each of their two regular English classes and one advanced English class participate in the study; thus, all students enrolled in English I during the fall 2007 semester were participants in the study.

Poetry WebQuest

The WebQuest used in this study was created by the researcher, in coordination with the three teachers used in the study. Poetic literary terms were chosen by the teachers as the topic to be explored through a short-term WebQuest. After a review of WebQuests available through QuestGarden (http://WebQuest.org), the teachers and researcher decided to create an original WebQuest that directly related to the literary terms that are covered in the English I curriculum and also are tested on the End of Course test for English I.

The WebQuest design for this study was entitled "You're Hired." and had as learning objectives the goal of providing students an opportunity to review key poetic literary terms and then to be able to identify and explain the use of these terms in context. Students would review the definitions of eight poetic literary terms (rhyme scheme, purpose/theme, metaphor, mood/meaning, tone, simile, personification and imagery) and then were asked to identify examples in songs provided and explain the use of the poetic literary terms in each instance. The final component of the WebQuest required students to integrate their knowledge of the poetic literary terms into the creation of an original poem/song that contained examples of the poetic literary terms.

The attention grabber of "You're Hired" was used to pull students into the WebQuest. Students were told in the introduction that they were hired by a major record company to find poetic terms that appeared in popular songs. The task put forth in the WebQuest required students to review important poetic devices, identify these poetic devices in several songs, and finally to write an original song/poem which contained at least three poetic devices. The process portion of the poetry WebQuest presented the task in three separate parts. The first part was to write definitions for each of the poetic literary terms in the students' own words. The second part of the process instructed students to find examples of the poetic literary terms in three different songs provided to them, find examples of poetic literary terms in two additional songs of their choosing, and then to write an original song which used at least three different poetic literary terms. The conclusion and final project required students to write short descriptions of the use of poetic literary terms and assemble the descriptions into a booklet and to include the original song/poem that contained several examples of the poetic literary terms to

illustrate authentic learning. A rubric was provided to the students in addition to extra websites to help them better understand the eight poetic literary terms. (See Appendix F)

Data Collection Methods

All students in each of the sections completed a pre-test prior to beginning the WebQuest on poetry. The pre-test assessed the students' knowledge of the poetry prior to the completion of the WebQuest using 12 multiple choice questions. All students then completed the WebQuest on poetry (see Appendix F). Students were randomly grouped in each class by the teachers into groups of two for the completion of the WebQuest. After completing the WebQuest, all students then completed a post-test (the same as the pre-test) to assess the knowledge gained through the completion of the WebQuest.

The pre- and post- test was comprised of 12 items that focused on the material presented in the WebQuest (see Appendix E). The assessment was taken from the North Carolina Department of Education's website on assessment and contained released questions from previous ninth-grade End of the Course tests. Since the WebQuest was developed prior to the identification of the pre- and post-test, there was a mis-match on items being addressed in the WebQuest and items being assessed by the pre- and post-test which was not identified until after the completion of the study. The pre- and post-test contained questions that focused on poetic literary terms presented in the WebQuest, including two questions about theme, three questions about purpose, one question about imagery and one question about tone. The remaining five questions focused on analyzing words and phrases, similar to identifying similes, metaphors and personification (see Table 3).

Table 3: Pre- and post-test questions with poetic literary term focus

Pre- and Post-test Question	Poetic Literary Term Focus
1. Which of the following statements best expresses the theme of the poem?	Theme
2. Throughout the poem, the poet uses imperative sentences such as "Sit down," "Be quiet," and "Communicate slowly," to emphasize which of the following?	Analysis of word/phrase
3. How do the phrases "unconditional breath" and "three-dimensional life" best exemplify the advice the poet gives in section II?	Purpose
4. By telling the audience to "communicate slowly" in line 15, the poet is telling the reader to do which of the following?	Analysis of word/phrase
5. In line 14 in the expression "shun electric wire," the poet seems to be encouraging which of the following?	Analysis of word/phrase
6. The poet uses lines 9-11 to emphasize which of the following ideas?	Purpose
7. Which of the following best expresses the theme of the poem?	Theme
8. Which of the following best describes the tone of the selection?	Tone
9. What effect does the author achieve with the imagery used in lines 5-9?	Analysis of word/phrase
10. What does the poet mean when she writes, "We also risk bravado" in line 16?	Analysis of word/phrase
11. The use of parallel verbs in line 23-27 emphasizes which of the following?	Analysis of word/phrase
12. What does the poet suggest by using the title "Art in America"?	Purpose

While each class completed the WebQuest and the pre- and post-tests, the researcher observed several of the classes (see Appendix A). Field notes were taken during the observations and then typed up following the data collection.

Focus groups of students were formed from the students who returned the parent permission form to be interviewed. Fifteen students in two classes returned signed parent permission forms. Only 12 of the 15 students who returned the forms participated in the focus groups because two students were absent from school on the day of the focus group interviews and another student was late to school, therefore missing class the day of the focus group interviews. Focus groups are "a special type of group in terms of purpose, size, composition, and procedures" with the purpose of "to listen and gather information" (Krueger & Casey, 2000, p. 4) about a specific topic. Focus groups were used based upon the pilot study. During the pilot study, the researcher had more success talking with students in a group than one-on-one; therefore, a switch from individual interviews was made in the final study. The use of focus groups allowed for the researcher to go beyond the numbers of if students learn and to delve into the how of student learning in regards to WebQuests.

Three focus groups of four students each were interviewed after completion of the WebQuest and post-test (see Appendix B). The focus group interview protocol was field tested during the pilot study and altered based upon that administration. The focus groups focused on the process of completing the WebQuest, learning outcomes, transfer of knowledge, and impact of group members upon the students. The students were asked to complete a transfer activity at the end of the focus group. Students were given a poem

and asked to find a metaphor, the rhyme scheme, the purpose, and the tone of the poem, all activities they had done in the WebQuest.

Informal interviews with the three teachers occurred before and after the students' completion of the WebQuest (see Appendices C and D). Notes were taken by the researcher and then transcribed after the data collection. The teacher interviews provided a better picture of students learning styles and personalities (see Figure 2).

Figure 2: Chart of the Flow of Data Collection

Data Management

Data collection was in the form of written notes, audio recordings of focus group interviews, and test results. The notes from the observations and interviews, along with the audio recordings of the focus groups with students, were transcribed for analysis.

Confidentiality was maintained by the use of pseudonyms for the teachers and focus group students. Additionally, all students were assigned code numbers to assure confidentiality throughout the entire process. The coding record was kept separate from the test results and other data. Copies of all data were kept in a secondary location in case of computer failure or other unforeseen circumstances.

Data Analysis

The two types of data collected for this study, quantitative and qualitative, were analyzed using the following methods for each. The pre- and post-test scores were graded, entered into SPSS 13.0 according to each student, and analyzed using a

descriptive statistical analysis, a quantitative approach. Two-hundred eleven student scores on the pre- and post-tests were compared to ascertain if knowledge had been gained through the completion of the WebQuest.

The focus groups, interviews, and observations were analyzed using qualitative methods that provided rich descriptions of how learning occurred during the WebQuest. After each focus group, the audio tapes were transcribed. These transcripts were then coded for relevant themes using Kruger and Casey's (2000) "long-table approach." The "long-table approach" requires the researcher to read through all transcripts to get an overview of what was said. Then the transcripts are cut apart and categorized according to themes based upon the research questions (Kruger & Casey, 2000). Additionally, the teacher interview notes were typed up and then coded using the same approach as to coding the focus group transcripts. Observation notes were also coded with the same themes as the interviews and focus groups. The researcher looked for themes that related to the process of learning during the completion of the WebQuest and used multi-media learning theory as a basis for the themes. The three themes identified include: selection of information, organization of information, and integration of information. Additionally, other themes emerged from the table-top approach to coding and include transfer of knowledge, student reactions to the WebQuest and the teacher's role in the WebQuest.

Ethical Considerations

This study was submitted to the Institutional Review Board for IRB approval in May of 2007 and final approval was granted on June 26, 2007. All participants, teachers and students, were provided information about the purposes of the study and the data collection and analysis processes to be used. Consent forms were gathered from the

teachers and students' parents prior to any data collection to ensure that all parties involved were knowledgeable about the purposes and procedures used in this study. Additionally, pseudonyms were used for the school, teachers, and students participating in the study to ensure privacy.

Inference Quality

Using a mixed-methods approach requires the use of different terms than are commonly used in either quantitative or qualitative research. Instead of discussing the internal validity (a quantitative term) or the credibility (a qualitative term), mixed-methods researchers use the term inference quality when discussing the "accuracy with which we have drawn both our inductively and our deductively derived conclusions from a study" (Teddlie and Tashakkori, 2003, p. 36). Internal validity and credibility are concepts that are similar because they both determine how accurately the researcher believes that his or her conclusions and findings represent the study accurately and therefore the term inference quality is used in mixed-methods research (Teddlie and Tashakkori, 2003).

Inference quality has two aspects: design quality and interpretive rigor. Design quality refers to the standards for the evaluation of the methodological rigor of the mixed-methods research and interpretive rigor refers to the standards to for the evaluation of the accuracy or authenticity of the conclusions (Greene, 1989; Teddlie and Tashakkori, 2003).

In this study, inference quality can be assured because of the multiple data sources and multiple methods of collecting and analyzing the data. Additionally, the mixed-methods of this study ensure triangulation of data and findings.

CHAPTER FOUR: REPORT OF THE STUDY

Purpose

A close examination of the effects of WebQuests on student learning needs to be completed to ensure that the technology applications being used in classrooms have positive effects on students and student learning. The lack of published research on this topic creates a gap in the literature. This gap in the research provides the opportunity to use multimedia learning theory and the active processing assumption to examine in-depth the effect that WebQuests have on the learner and the learner's selection, organization, and integration of information from the inquiry-based project.

Based upon the lack of research about if and how learners learn by completing WebQuests, this empirical study answers the following questions:

1. Do learners learn using WebQuests?
2. How do learners learn with WebQuests?
    a. How does the learner select information while completing the WebQuest?
    b. How does the learner organize the information selected while completing the WebQuest?
    c. How does the learner integrate selected and organized knowledge during the WebQuest for the completion of the final project?

Participants

Of the 232 total 9th grade students in the six regular and three advanced English classes in the study, 211 completed both the pre- and post-tests along with the WebQuest over a three-day period during the fall 2007 semester. There were 21 students who completed either the pre-test and the WebQuest, or the post-test and the WebQuest, but not both the pre- and post-test; therefore, those students were not included in the analysis. Three groups of four students each - a total of 12 students - participated in focus groups to determine if and how they learned about poetry through the completion of the WebQuest. The students who participated in the focus groups were all enrolled in sections of regular English I; however, the teachers later stated that the students in the focus groups from these regular classes represented a variety of intellectual abilities (see Table 4).

Table 4: Number of Student Participants

	Pre and Post Test	Focus Group
Total Number of Student Participants	211	12
Mrs. Buc	66	8
Ms. Navigator	72	0
Mr. Saber	73	4

Research Question One

The quantitative data, pre-test and post-test scores, were analyzed to determine if students learned about poetry through completion of a WebQuest in response to the first research question. A Student's *t*- test was used to compare the pre-test and post-test scores. The mean difference from pre-test and post-test scores for the N=211 students

decreased .085 points, with a standard deviation of 2.13. A two-tailed *t*-test on the score difference was not statistically significant ($t(210) = .561$, $p > .05$), revealing that, on average, there was no difference in scores through the completion of the WebQuest on poetry. Of the 211 students who completed both the pre-test and the post-test, 40% (n=84) of the students' scores increased. However, 19% (n=41) of the students scores stayed the same from the pre-test to the post-test and 41% (n=86) of the students' scores actually decreased from taking the pre-test to taking the post-test. The mean score on the pre-test was 6.21 out of 12 items and the mean score on the post-test was 6.13 items out of 12.

A comparison of the scores on the pre-test to the scores on the post-test by teacher illustrates that there was a slight drop in scores across all three teachers (see Table 5). This similar drop in scores signifies that specific teachers had no effect on the students performance on the WebQuest, as all the mean scores went down for all three teachers. It is interesting to note that one teacher, Mr. Saber, had lower scores on both the pre-test and post-test compared with the other two teachers. This difference may be explained by the hands-off approach that Mr. Saber displayed in the computer lab while his students completed the WebQuest. This issue is explored further later in the data analysis section.

Table 5: Pre-test and Post-test Mean Scores and Standard Deviations by Teacher

	Pre-test Mean (SD)	Post-test Mean (SD)
Mrs. Buc	6.73 (2.43)	6.71 (2.54)
Ms. Navigator	6.18 (2.06)	6.15 (2.09)
Mr. Saber	5.78 (2.12)	5.58 (2.09)

As pre-test scores were significantly different among teachers ($F(2,208) = 3.221$, $p=.042$), an Analysis of Covariance was performed on the post-test scores using the pre-test as a covariant. This analysis revealed no significant difference between the teachers ($F(2,208) = 1.447$, $p=.238$).

A class-by-class examination of the difference of the mean pre-test and mean post-test scores was conducted to see if there was a difference among classes. Table 6 illustrates that while the mean scores varied between the classes, there was not a significant difference between the pre-test and post-test scores of any one class.

Table 6: Pre-test and Post-test Mean Scores and Standard Deviations by Class

	Class	Pre-test Mean (SD)	Post-test Mean (SD)	Mean Difference
Mrs. Buc	1	5.91 (1.97)	5.82 (2.43)	-.09
	2*	8.00 (2.29)	8.18 (2.05)	.18
	3	5.23 (1.77)	4.95 (2.47)	-.27
Ms. Navigator	1	4.89 (1.41)	4.94 (1.89)	.06
	2*	7.63 (1.69)	7.37 (2.19)	-.26
	3	5.59 (1.93)	5.74 (2.16)	.15
Mr. Saber	1	5.00 (1.83)	4.91 (2.11)	-.09
	2*	6.89 (2.10)	6.68 (2.11)	-.21
	3	5.18 (1.87)	4.86 (2.15)	-.32
OVERALL		6.21 (2.22)	6.13 (2.39)	-.86
* - Advanced level class				

Additionally, there was not variation in the score differences between the students enrolled in regular English I and those enrolled in honors English I courses. Table 7 shows the break down of score differences by class level.

Table 7: Score Differences from Pre-test to Post-test by Level

Level	Number of Students	Score Difference Mean	Score Difference Standard Deviation
Advanced	88	-.0795	2.10
Regular	123	-.0894	2.15

Given that there were no significant differences from the pre-test to the post-test, the researcher conducted an item analysis to see if there were noteworthy differences on particular sections of the test. Based on an analysis of the questions by poetic literary term focus, as shown in Table 8, it appears that students had difficulties with all four focus areas (theme, purpose, tone and analysis of word/phrase meaning). Questions 6 and 10 on the pre-/post-test are the two questions that had the most improvement by the students from the pre-test to the post-test. However, since questions 6 dealt with the purpose of the poem and question 10 focused on the analysis of a phrase, there is no obvious connection between the two areas and one cannot prove that the WebQuest was the reason for this improvement.

Table 8: Item Analysis of Pre-test and Post-test Questions

Pre- and Post-test Question	Poetic Literary Term Focus	Number of students who answered question correctly on pre-test	Number of students who answered question correctly on post-test
1. Which of the following statements best expresses the theme of the poem?	Theme	169 (80%)	150 (71%)
2. Throughout the poem, the poet uses imperative sentences such as "Sit down," "Be quiet," and "Communicate slowly," to emphasize which of the following?	Analysis of word/phrase	139 (65%)	134 (64%)
3. How do the phrases "unconditional breath" and "three-dimensional life" best exemplify the advice the poet gives in section II?	Purpose	112 (53%)	89 (42%)
4. By telling the audience to "communicate slowly" in line 15, the poet is telling the reader to do which of the following?	Analysis of word/phrase	94 (45%)	96 (46%)
5. In line 14 in the expression "shun electric wire," the poet seems to be encouraging which of the following?	Analysis of word/phrase	167 (79%)	170 (81%)
6. The poet uses lines 9-11 to emphasize which of the following ideas?	Purpose	112 (53%)	123 (58%)
7. Which of the following best expresses the theme of the poem?	Theme	66 (31%)	65 (30%)
8. Which of the following best describes the tone of the selection?	Tone	59 (28%)	56 (27%)
9. What effect does the author achieve with the imagery used in lines 5-9?	Analysis of word/phrase	139 (66%)	137 (65%)
10. What does the poet mean when she writes, "We also risk bravado" in line 16?	Analysis of word/phrase	75 (36%)	90 (43%)
11. The use of parallel verbs in line 23-27 emphasizes which of the following?	Analysis of word/phrase	83 (39%)	73 (35%)
12. What does the poet suggest by using the title "Art in America"?	Purpose	79 (37%)	76 (36%)

The above table illustrates the range of correctly answered questions on the pre-test and also the post-test. There is no one focus area in which students did consistently well or consistently poor. Questions 6 and 10 appear to be the most improved by the WebQuest; however, there is no obvious reason why the students would be able to correctly answer these two questions than the other questions on the assessment.

Research Question Two

To answer research question two, "How do students learn with WebQuests," data were collected from student focus groups, teacher interviews, and classroom observations. The long-table analysis approach was used to guide the collection and analysis of data (Kruger and Casey, 2000). All data were coded under one of six themes: a) selection of information, b) organization of information, c) integration of information, d) transfer of knowledge, e) student reactions to WebQuests, and f) teacher's role in the WebQuest. The "long-table analysis approach" requires the researcher to read through all transcripts to get an overview of what was said. Then the transcripts are cut apart and categorized according to themes based upon the research questions (Kruger & Casey, 2000). The following section summarizes data from each of the six themes.

Three focus groups were conducted with the 12 students who had returned parent permission forms and were present on the day of the focus groups. The purpose of the focus groups was to find if the students thought they had learned from the completion of the WebQuest, and how they were able to learn during the WebQuest. Each focus group consisted of four different students from the regular English I classes who returned the parent permission form and were in class on the day of the focus group interviews. The

focus groups occurred two to three days after the students had completed the WebQuest and post-test. Focus group discussions were audio taped. While the groups often agreed, there were several students who emerged as talkers and representative of the groups. Often, these students would say something and the other students in the focus group would agree. For example, in one group, when students were asked "What did you learn from doing this WebQuest?,"

Student 3 'Fred' - *"Irony"*

Student 1 - *"same for me"*

Student 4 - "*same*"

There were five students in the focus groups, out of the three groups of four students, who were the main talkers in the groups and are referred to with pseudonyms (Chrissy, Johnny, Marta, Jane, and Fred) in the following section. The focus groups students were described by the teachers are representative of the classes being taught during the fall 2007 semester. The focus group students, although enrolled in a regular level course, represent a wide variety of levels of students according to the teachers in the study. Using multimedia learning theory as a framework, the researcher focused on the selection, organization, and integration techniques that the students displayed during classroom observations and in the focus groups to answer research question two: *How do learners learn with WebQuests?*

Theme A – Information Selection

Mayer (2001) explains the active processing theory assumption of multimedia learning theory as having three stages, a) information selection, b) information organization and c) integrations of information. The first stage, information selection,

was the basis for the first theme in this study. In order to determine how students selected information for the WebQuest, data from the classroom observations, student focus groups and teacher interviews were analyzed.

The first portion of the WebQuests required students to define eight different poetic literary terms. Students were provided links to several websites focusing on the specific terms. They were then required to select useful information to aid in the creation of a definition for each term. Two of the three teachers circulated throughout the computer lab to assist students in the completion of the WebQuest, while one teacher remained aloof during the WebQuest. During observation of one of Mrs. Buc's classes, she had to focus the students on the task at hand because they were excited about being in the computer lab, instead of the regular classroom. When the students first entered the computer lab, they wanted to check e-mail and do other activities, besides the assigned WebQuest. Students appeared to have issues following directions, because they kept asking what they had to do. Mrs. Buc instructed the students to follow the directions of the WebQuest on the computer screen.

As Mrs. Buc circulated in the computer lab during the first day of the WebQuest, several students asked her questions about what they needed to write down. One student, during the observation, asked the teacher, "What do we have to write down…do we have to copy the entire definition?" Mrs. Buc then told the student to "rephrase what you read…write down the definition…follow the instructions." This interaction demonstrates students' reliance on their teachers for help in selecting what information is important. Despite the explicit directions provided in the WebQuest and on the worksheet, students still relied on Mrs. Buc in deciding what information was important.

In the post-WebQuest interview, Mrs. Buc commented on the usefulness of the worksheet as a tool of the WebQuest by stating that the "worksheet really helps the students stay on task." The worksheet was added to the WebQuest after the pilot study, because students needed a place to write down the information provided. Many of the students in the pilot study simply read the definitions and jotted down rough notes about the songs; the students in the final study were able to use the worksheet, created by the researcher, as a tool to assist in the completion of the WebQuest. However, the addition of the worksheet to the WebQuest did not keep students from having problems completing the WebQuest. While during the pilot study, students had problems with the definitions for the poetry terms because they did not write them down, students during the final study also had problems with definitions because even though the worksheet provided a place to write down the definition, the students had trouble coming up with a definition despite having just read examples on the websites in the WebQuest.

In the focus groups, students reported that they used the worksheet to help in deciding what information to select. All three focus groups reported that they used the worksheet in helping to select information. When asked what steps they used to complete the WebQuest, Johnny stated, "That's all you got to do is follow directions," referring to both the worksheet and the WebQuest itself. While following directions is a task that students are asked to do every day, when faced with a new situation, that of completing a WebQuest, students had difficulties.

The terms that the students were asked to define for the WebQuest were not new to them. When asked if she had seen the poetic literary terms before, Jane said, "Yeah – it was like a review." Many students in the focus groups had heard the poetic literary

terms before and had even been taught them before; however, when asked to define the terms, students had difficulty. The different links provided to help students in defining the eight poetic literary terms led to some problems for students. On several of the links, the students had to read a paragraph and decide what the meaning of the term was based on the description. Without a specific, one-sentence definition provided, the students appeared to have difficulty writing down their own definition of the terms. All eight terms had at least three different web links that the students could use in the creation of their definitions of the poetic literary terms. By providing several options without a specific correct answer, the students were forced to create their own definitions of the poetic literary terms based on both prior knowledge and the information provided by the WebQuest links. Marta said during the focus group, "It's like you know what they are [the poetic literary terms] but don't know the definitions."

In summary, based upon the data from the classroom observations, the teacher interviews and student focus groups, it appears that the students relied heavily upon the worksheet and the direction of the teacher as to what information was selected. Thus, only information asked for by the worksheet or by the teacher was selected by students as being necessary information to learn during the WebQuest.

Theme B – Organization of Information

The second stage in the active processing theory assumption of multimedia learning theory focuses on the organization of information selected in stage one by the learner (Mayer, 2001). In order to determine how students organized the selected information for the WebQuest, data from the classroom observations, student focus groups and the worksheets complete by the students during the WebQuest were analyzed.

Below is a summary of the data regarding the organization of information by students during the WebQuest.

When asked about how they chose to organize their information, students in the focus groups responded that they relied on the organization of the worksheet as well as what the teacher told them to do. All three groups agreed that the worksheet was useful in organizing the information. Several students reported that the worksheet was extremely helpful in the organization of the information presented in the WebQuest. Chrissy, when asked if the worksheet helped in the completion of the WebQuest, stated, "Yeah, 'cause you could refer back [to it]." One student who did not use the worksheet in the completion of the first part of the WebQuest ran into problems when he came to the second part of the WebQuest. This particular student had trouble figuring out the rhyme scheme for one of the songs. When the teacher asked what a rhyme scheme was, the student reported that he did not know. The teacher then asked what he had written down as a definition on the worksheet; at that point, the student admitted that he had not written anything down on the worksheet; instead, he had just looked at the first few links and then skipped ahead. This interaction between one student and the teacher illustrates that if a student did not organize selected information, then recall of that information was more difficult, if not impossible, since the student reported not paying attention to the information in the first place.

Analysis of the worksheets done by one of Ms. Navigator's classes provides an interesting view into how students chose to organize the information presented in the WebQuest. Of the 18 students in that class, there were 2 students who did not complete section one, the definition portion of the WebQuest task. The 16 remaining students did

complete the definitions; however, many students chose to copy definitions from the websites instead of putting the definitions in their own words as instructed by both the WebQuest and the worksheet. For example, 12 of the 16 students had the exact same definition for rhyme scheme taken from one of the websites. All 12 students used the words "exact correspondence of rhyming sounds at the end of poetry" for their definition of rhyme scheme. While this is a correct definition, the students were asked to write their own definitions. Instead of reading what was provided on the websites and organizing that information into an original definition, many students chose to copy definitions.

In summary, based upon the data from the classroom observations, student focus groups and analysis of the worksheets from Ms. Navigators' class, it appears that the students relied heavily upon the worksheet and the direction of the teacher on how to organize the information that they selected during the WebQuest. Since only information asked for by the worksheet or by the teacher was selected by students as being necessary information to learn during the WebQuest, this was the same information organized by the students. The students did not appear to try and organize information in any other way than what was provided to them.

Theme C – Information Integration

The third part of research question two focused on the integration of information which the learners had selected and organized into new knowledge. Information integration is the third stage of the active processing theory assumption of mulitimedia learning theory (Mayer, 2001). Student focus groups provided the data for this portion of the research and a summary of the data follows.

Students were asked to combine the information from the worksheet with both additional songs of their choosing and an original song/poem to create a poetry booklet that showcased their understanding of the poetic literary terms. The creation of an original song/poem that included examples of the poetic literary terms allowed for authentic learning to take place. The poetry booklet had to contain not only the song lyrics, but a short paragraph explaining the use and purpose of specific poetic literary terms in the song.

Students in the focus groups agreed that the worksheet was helpful in the completion of the final project. When asked if the worksheet helped in the completion of the poetry booklet, several students said, "Yeah," and one student gave the reason, "'cause you could refer back" meaning that the worksheet allowed students to have a record of what they had thought prior because they had written it down. However, simply copying what they had on the worksheet was not part of the WebQuest. The students had to integrate their original thoughts into a paragraph that captured why the song contained the various poetic literary terms. This caused problems for Fred. During the focus groups he stated, "I didn't understand the question…the part where we had to write it in our own words and then write a paragraph or whatever. I didn't understand what it means." Fred was unable to integrate the basic definitions and identification of poetic literary terms into a paragraph explaining the purpose of using those terms in the various songs.

The all of the students who participated in the focus groups reported that they thought they had learned through the completion of the WebQuest. Johnny reported that

he learned "all the stuff you had forgotten…the metaphors and junk." Another student reported that she "learned more about similes and metaphors and stuff." Chrissy stated:

> It was useful because I don't like using a book – the computer was easier because the book makes stuff sound boring because you have to keep reading it and they make it difficult and using the computer made it fun.

This student confused learning with the excitement of using a computer. Several other students reported that they had fun completing the WebQuest and that they would do it again.

In summary, the data gathered during the focus group interviews illustrate that students relied heavily upon the worksheet in an attempt to integrate the knowledge selected and organized into new knowledge. However, the students had problems completing the final project in the WebQuest because during the selection and organization phases, the learners were just going through the motions and not really attempting to learn anything. Therefore, when asked to integrate the selected and organized information into a new activity the students could not do it. Some students, Fred in particular, got caught up in the deciphering the directions for the final project because he had not really learned the definitions to the poetic literary terms. Without being able to define the terms and locate example in the songs provided, students were not able to integrate the definitions and identifications into a paragraph explaining the purpose of using the poetic literary terms in the songs and poems.

In addition to the original research question of *How students learn using the WebQuest?*, three other themes emerged from the table-top analysis of the data. These three areas, transfer of knowledge, student reaction to the WebQuest and teacher's role in

the WebQuest, provide additional lenses in which to examine the effects of WebQuests on student learning.

Theme D - Transfer of Knowledge

WebQuests require learners to take newly-acquired information and transform the information into authentic learning. Simply taking information from websites and putting the same information into a project does not allow the learner to transform the information into knowledge. March points out that "getting the information - the 'learning input' – is the easy part. The WebQuest gets trickier and more interesting in the next part, in which transformative learning takes place and teachers and students can realize – or fail to realize – the potential of a WebQuest" (2003, p. 42).

Transfer is an important area in the field of cognitive science. Learning and transfer are central to cognitive science. Transfer goes beyond merely memorizing information to understanding the information; it includes a learner's ability to transfer what he or she has learned to new and different situations (Bransford, et al., 1999). The concept of transfer of learning is essential in determining if students are simply memorizing material or actually understanding the material. In order to determine if students are learning material presented in WebQuests, it is essential to see if the material can be transferred beyond the WebQuest. If students understand the material presented in the WebQuest, then they should be able to transfer that knowledge to other situations.

During the focus groups, all three groups of students reported that they had learned from the WebQuest. However, after the students in the focus groups were asked to complete a transfer activity, they altered their point of view on how much they had learned. For the transfer activity, students in the focus groups were given a poem and

asked to find the rhyme scheme, the purpose/theme, a metaphor, the mood, and the tone of the poem, all things they had done in the WebQuest. The table below represents the number of correct answers students had on the transfer activity (see Table 9).

Table 9: Frequency of Correct Answers on Transfer Activity

Literary Term	Number of Students with Correct Answer	Number of Students with Incorrect Answer	Number of Students with no Answer
Rhyme Scheme	11	1	0
Purpose/Theme	7	3	2
Metaphor	4	5	3
Mood	2	8	2
Tone	2	5	5

During this transfer activity, several of the students appeared stuck on remembering definitions and therefore left blanks on their papers for several answers. One student, instead of writing an answer, wrote "I 4got" in the tone answer blank.

After the students in the focus groups either completed or gave up on the transfer activity, the researcher asked them if they learned anything from the completion of the WebQuest. Students in the first and second focus group said, "Not really." In the third focus group, the students reported that the WebQuest helped a little bit in understanding the poetic literary terms but that they did not learn a lot from the completion of the WebQuest. For example, Jane reported, "[WebQuests] are kinda good and bad – it's weird – I don't remember what a metaphor is…" and Marta said that during the WebQuest "you can go back and double check – but without it – don't know."

Students who initially reported that they had learned from the completion of the WebQuest changed their mind after being asked to integrate their learning into a new activity and were unable to do so. This lack of transfer of knowledge verifies the finding of the pre- and post-test data where students did not appear to have gained knowledge from the completion of the WebQuest.

Theme E - Student Reactions to the WebQuest

During both the classroom observations and the focus groups, students commented on the WebQuest itself. The comments ranged from excitement about completing the WebQuest to dislike of the WebQuest and these comments all speak to the motivation factor of using a WebQuest instead of traditional methods of instruction.

Motivation Reactions

Motivation affects a learner's ability to transfer knowledge beyond simply memorizing (Bransford et al., 1999; Lambert & McCombs, 1998; McCombs, 1998). When students opened up the WebQuest, the screen stated "You're Hired" in large bold letters. During the classroom observation, several students showed excitement. One student said, "You're hired…cool," and another excitedly said, "I got a job," in response to reading the Introduction. During the focus group, one student commented, "[I] kinda just did it [the WebQuest]…just tried to get to *Stairway to Heaven* cause that is one of my favorite songs." While one of the songs in part two of the WebQuest was an incentive for this student, some of the students did not like the songs, and therefore disliked the WebQuest.

During an observation, a student stated, "Garth Brooks…uugghh!!" Another said, "This is hard. I don't like poetry and stuff…I don't like Garth Brooks." The dislike of

one of the three artists whose music was used in the WebQuest gave some students an excuse for disliking the WebQuest. While I observed one of Mrs. Buc's classes, one student looked at me and said, "I would rather be listening to Mrs. Buc than doing this [WebQuest]." This statement illustrates how this particular student appears to have enjoyed interacting with his teacher, as opposed to the computer and the WebQuest.

The comments ranged from excitement about completing the WebQuest to dislike of the WebQuest and these comments all speak to the motivation factor of using a WebQuest instead of traditional methods of instruction. Students appeared to be motivated by the computers, not the desire to learn about poetic literary terms during the completion of the WebQuest.

Social Constructivism Reactions

Another aspect of the completion of the WebQuests that students either liked or disliked was working in cooperative social groups. The social and individual experiences of learners play an important role in learning and knowledge acquisition (Doolittle & Hicks, 2003). The acquisition of knowledge is seen by some as a compilation of individual experiences that varies depending upon who participates in the social group and what the purpose of the group is (Bredo, 2000; Doolittle & Hicks, 2003; Philips, 1995; 2000; Prawat & Floden, 1994; Shapiro, 2003). In this study, the social process did not happen consistently; therefore, the students did not always construct knowledge. Johnny commented that working in groups "helped because what you didn't know your partner might have known." Another student stated during the focus group, "It [the WebQuest] might have gone faster – cause you could give people different parts and stuff and look up definitions." Both of these students focused on the splitting up of the work

load to help in the completion of the project. By having more than one person working on the WebQuest, the students felt that the process would go quicker and be easier.

However, there were several students and teachers who did not like the idea of working in groups. Mrs. Buc allowed for several students to work individually on the WebQuest instead of in a group. However, this backfired, because the students who worked individually during one of the observations spent more time socializing, and Mrs. Buc had to continually ask them to be quiet and not talk to students at other computers, while the students who worked in groups were more focused on work on the WebQuest. During the focus groups, students in the first focus group commented that working in a group was a hindrance to the completion of the WebQuest, not a help. One student said that there was "a lot of talking and not much got done." Another student, who choose to work individually, said, "I think that if we were in groups we would not have really got it done cause we would have been talking too much." The social aspect was not the only negative aspect of completing the WebQuest in a group; one student from the first focus group focused on the work load. She had been paired up with a lower level student and stated "I had a partner but I did all the work – I am used to doing all the work – I do not depend on other people." The students in her focus groups said that she was chosen to work with the lower level student on purpose, because the teacher knew she would complete the project. Her comment confirmed that is what happened.

These comments and observations are important when examining WebQuests through a social constructivist lens. While the WebQuest was designed to be a social activity in which students would be able to work together to create knowledge, that did not occur consistently in this study. Since students were allowed to work individually,

some students did not have a partner or group members to interact with during the completion of the WebQuest. Additionally, those students who did work in pairs/groups did not always work together. Some groups split up the workload therefore removing the social aspect of the WebQuest. Instead of working together, the student who was working on a specific section would do the work, while the other group members would talk to other students or just sit there. Allowing students to choose whether they worked alone or with partners allowed the students to either make the learning a social process or an individual process. The social aspect of WebQuests raises a lot of interesting factors, including work load and unnecessary talking and socializing during the project that some students saw as a positive aspect of the project and others saw as negative aspects to the project being group-based.

Theme F - The Teachers' Role in the WebQuest

Mr. Saber and Mrs. Buc exemplified two different approaches to using the WebQuest in their classrooms. Mrs. Buc was actively involved with her students while they completed the WebQuest while Mr. Saber was not involved with the students' completion of the WebQuest. Ms. Navigator was involved with her students during the WebQuest, but at the same extreme level as Mrs. Buc. Below, the two extreme approaches are described and illustrate the spectrum of teacher involvement with WebQuests.

Not Involved

Mr. Saber had little participation with his students during the completion of the WebQuest. On the first day, after collecting the pre-tests, Mr. Saber wrote the URL for the WebQuest on the board and handed out the worksheet to the students in each of his

three classes. He directed his students to work in pairs over the next two days to complete the WebQuest. After escorting his three classes to the computer lab, he sat down at a table in the front of the computer lab and proceeded to grade papers. Several students asked the researcher to help them access the website and what they were supposed to do. At the end of the first period, Mr. Saber took the students back to the classroom and informed them that they would have one more day in the computer lab to finish the WebQuest prior to taking the post-test. On day two, Mr. Saber once again escorted his students to the computer lab. Day two was different from day one, because Mr. Saber did circulate throughout the computer lab after the researcher informed him that her role was to simply be an observer in the computer lab. Students asked Mr. Saber questions about completing the WebQuest, and he was able to answer their questions. When asked if he would use WebQuests again in the future, Mr. Saber responded "yes – I would have to figure out where to get one, but I would use it." This statement in which Mr. Saber wants to find a WebQuest instead of creating one hints at his using the WebQuest as more of a time consuming activity, and not a chance to teach students new material.

Extremely Involved

On the other end of the spectrum was Mrs. Buc. After the students completed the pre-test, she explained what they would be doing in the computer lab for the next two days. After escorting the students into the computer lab, Mrs. Buc had them sit at specific computers and log into their school computer accounts. Students were allowed to choose if they worked in pairs or alone. Only after all of the students had logged in did Mrs. Buc provide the URL for the WebQuest to the students. At this point, Mrs. Buc

then handed out the worksheets to the students to complete. Mrs. Buc circulated throughout the room as the students got started on the WebQuest. When students had questions, Mrs. Buc would instruct them to follow the directions on the WebQuest. One set of students appeared to be having problems completing the worksheet, and Mrs. Buc figured out that they were trying to do the worksheet without reading the WebQuest. Another group of students had problems finding the second part of the WebQuest, and Mrs. Buc directed them to scroll down their screen to find the directions. Mrs. Buc did work with a student who had problems figuring out what the rhyme scheme for one of the songs was. The teacher worked with the student to ensure that he understood what a rhyme scheme was and that he could identify it in the song before moving on. When Mrs. Buc was asked if she would use WebQuests again in the future, she responded that "probably, however, I would have my husband make it for me. I am not sure on what topic though – the freshman curriculum is too jammed packed for extra stuff." This comment illustrates that Mrs. Buc found WebQuests useful if they were created to enhance the class and not just used to take up time.

When asked if their teacher was helpful during the WebQuest, Mrs. Buc's students commented, "She helped when you needed help," and, "If you didn't understand what it was asking you to do…she would explain it a little further." Mr. Saber's students did not have anything to say about him helping them during the completion of the WebQuest. Close observations of these two teachers' different approaches to the teacher's role in the WebQuest illustrates the wide spectrum of teacher involvement in WebQuests.

Mr. Saber and Mrs. Buc exemplified two different approaches to using the WebQuest in their classrooms. Mrs. Buc was actively involved with her students while they completed the WebQuest while Mr. Saber was not involved with the students' completion of the WebQuest. Ms. Navigator was involved with her students during the WebQuest, but at the same extreme level as Mrs. Buc. These various levels of involvement by the teacher provide another lens for examining the effectiveness of WebQuests on student learning.

Summation

In order to determine if students learned about poetic literary terms through the completion of a WebQuest, students completed pre- and post-test. The 12-question test, taken from questions released from the state Department of Instruction, focused on the eight poetic literary terms presented in the WebQuest. The mean score for the students decreased slightly from the pre-test to the post-test.

Additionally, to determine how students learn with WebQuest, classroom observations, teacher interviews, and student focus groups were conducted to provide a better understanding. The classroom observations, along with the student focus groups, provided an insight into how students selected, organized, and integrated information about the eight poetic literary terms during the completion of the WebQuest. Additionally, the observations, teacher interviews, and student focus groups provided data on the students' reactions to the WebQuest and the role of the teacher in the completion of the WebQuest.

The students originally believed that they had learned during the completion of the WebQuest; however, after not being able to complete the transfer activity, the

students changed their minds and said that they obviously had not learned the material. Students seemed to think that they had learned simply because they had completed the WebQuest, but realized that they had not retained any knowledge on the poetic literary terms presented in the WebQuest after failing to successfully apply the literary terms to a new poem. This is verified by the slight decrease in scores on the post-test compared with the pre-test.

Additional themes that emerged during the data analysis phase include student reactions to the WebQuest and also the role of the teacher during the WebQuest. Student motivation and social constructivism emerged as two key factors in student reactions to the WebQuest. Students who enjoyed working on the computer and who also liked working in social groups appeared to react more positively to the WebQuest than those students who would have rather worked alone on the project and those students who did not care about using the computer. The level of teacher involvement, whether not involved or extremely involved, is another theme that emerged during classroom observations and focus group interviews. Further research needs to be conducted to see if the level of teacher involvement affects student learning with the WebQuest.

CHAPTER FIVE: IMPLICATIONS AND CONCLUSIONS

Introduction

The goal of this study was to begin to fill the void of research on student learning and WebQuests. Multiple data collection and data analysis methods were used with nine classes of ninth-grade English students to assess if learning occurs because of students' completion of a WebQuest. Comparison of pre-test and post-test data informed this study. Additionally, this study examined how students process the knowledge acquired during the completion of the WebQuest through focus groups with a subset of participants. This chapter provides a summary of the research questions and findings of the study. Next, the limitations and conclusions drawn from the study are discussed. Finally, the implications of the study are discussed along with possible future research based on this study.

Review of Research Questions

Because of the lack of research published about a learner's ability to learn through completion of a WebQuest, this study addressed the following research questions:

1. Do learners learn the addressed material through the use of WebQuests?
2. How do learners learn with WebQuests?
    a. How does the learner select information while completing the WebQuest?
    b. How does the learner organize the information selected while completing the WebQuest?

c. How does the learner integrate selected and organized knowledge during the WebQuest for the completion of the final project?

The quantitative data used to answer research question one showed that there was no statistically significant difference between the pre-test and the post-test scores. Students did not improve their understanding of poetic literary terms through the completion of the WebQuest. Despite the initial self-reporting of students interviewed that they did learn through the completion of the WebQuest, after the completion of a transfer activity, the students realized that they did not have a better understanding of the poetic literary terms that were covered in the WebQuest.

Inference Transferability

Just as inference quality is a term used in mixed methods which replaces the quantitative term, internal validity and the qualitative term, credibility; mixed methods research uses the term inference transferability to discuss the generalizablity of the results of the study. Typically, quantitative researchers are concerned with the external validity of a study and qualitative research look for transferability of the results (Teddlie and Tashakkori 2003). Inference transferability is a term which envelops the concepts of external validity and transferability when discussing the generalizablity of the results of the study.

Limitations of Study

The above examination of the effects of WebQuests on learners and learning has several limitations. One limitation is that this study was completed using one WebQuest made by the researcher, in cooperation with the teachers participating in the study. Additionally, only ninth-grade students were used in this study. The findings of this

study do not have inference transferability without further research looking at different subjects, grades and content areas.

WebQuests are assumed to be constructivist in nature (Dodge, 2001; March, 2003); however, it depends upon the design and implementation of each WebQuest. The researcher had planned on the WebQuest used being completed in social groups in which constructivism was a key part of the learning. However, because of how the teachers interacted with the students and what the students were used to experiencing the classroom, the constructivist aspect of the WebQuest used in this study was not actualized. Instead of working cooperatively to produce definitions for the poetic literary terms, students sometime split up the workload or relied on one person in the group to provide a definition.

An additional limitation concerns the creation of WebQuest. The researcher and the teachers worked together in the creation of the WebQuest because the researcher wanted the WebQuest to be a useful instructional event in the classroom, not just a research activity. The teachers had their own needs that the researcher focused on during the development of the WebQuest. The teachers wanted to focus on the definitions of the poetic literary terms as a large part of the WebQuest; therefore the first part of the WebQuest was devoted entirely to the students being able to define the poetic literary terms. However, on the End-of-Course test, which the students take at the end of the semester, and also the pre-/post-test, focused on application of the poetic literary terms not defining the literary terms. Therefore, there was a disconnect between the idea of creating a WebQuest which was application based and the wants of the teachers to have students be able to define the poetic literary terms.

Another limitation to this study is that the pre-/post-test used may not have been sensitive enough to pick up the nuances of learning that may have occurred during the completion of the WebQuest. Typically, poetry and poetic literary terms are covered during an approximately two-week period of the semester and therefore students are exposed to more examples of the various poetic literary terms. The pre-/post-test used comes from an assessment which typically covers the usual two-week period of instruction and therefore may be to broad for the learning which may have occurred during the course of the two-day WebQuest used in this study. The assessment did not match up evenly with the WebQuest and therefore could not assess if students learned during the WebQuests adequately. Possibly, a close analysis of the poetry booklets that the students created as a final project for the WebQuest could have illustrated the learning which may have occurred during the WebQuests. However, the researcher did not collect the poetry booklets during the data collection stage because the teachers had not graded them yet, and when the researcher later requested access to the final poetry booklets, the teachers either had returned the projects to the students or had disposed of the projects. Therefore, an analysis of the final projects was unable to be completed by the researcher. Despite the limitations of this study, this is a starting point for future research in the areas of student learning and technology in the classroom.

Conclusions

The purpose of this study was to begin to fill the void of research on student learning and WebQuests. The quantitative data used to answer research question one *Do learners learn using WebQuests?* did not statistically prove that learning occurred or did

not occurred during the completion of the WebQuest. There did not appear to be a difference between the teachers, nor between the levels of the students whether enrolled in regular or advanced sections of English I. Additionally, an item analysis of the pre-/post-test did not find any questions or areas of questions that students either had more or less trouble answering. All of these factors combined still do not indicate whether or not students actually learned about poetic literary terms through the completion of the WebQuest.

Close examination of the qualitative data gathered to inform research question two *How do learners learn with WebQuests?* elicited six themes including: a) selection of information, b) organization of information, c) integration of information, d) transfer of knowledge, e) student reactions to WebQuests, and f) teacher's role in the WebQuest. These six themes provide a lens for tying the research findings back to the literature.

The active processing theory assumption of multimedia learning theory was the basis for the first three themes, a) selection of information, b) organization of information and c) integration of information. This theory focuses on what learners do with the information once it is received via the auditory and sensory channels (Mayer, 2001; 2002; Moreno & Valdez, 2005). Mayer (2001) states that "these active cognitive processes include paying attention, organizing information, and integrating incoming information with other knowledge" (p. 50). The active processing theory assumption can be broken down into three parts: the selection of information, the organization of information, and the integration of information. When the learner selects information, they are deciding what words and images they need to input through either the auditory or visual channel. Once information is selected, the learner then organizes the images and words to help

make better sense of what they are learning. Finally, the images and words that have been selected and organized need to be integrated into the new knowledge that the multimedia technology was presenting (Mayer, 2001; 2002; Moreno & Valdez, 2005).

Theme A – Selection of Information

The first part of active processing theory, described briefly above, applies to theme a – selection of information. The data from classroom observations, teacher interviews and student focus groups illustrate the fact that students relied heavily upon the worksheet and directions from the teachers in deciding what information to select during the WebQuest. Although the information was presented using different modalities (Cassidy, 2004), the learners were not able to independently select the needed information to be able to go onto the next step. Additionally, the information selected never made it into the students short-term memory and consequently never into the long-term memory for use at later times (Baddeley, 1992; Bransford et. al., 1999; Whittrock, 1990).

Theme B – Organization of Information

The data from classroom observations, student focus groups and analysis of worksheets from one class builds upon the earlier finding that students relied heavily on their teacher and the worksheet in how to organize the information selected during the WebQuest, the second part of the active processing theory described above. As the students had difficulties individually selecting important information, the students also then had problems organizing the information into meaningful chunks of information to later integrate into new learning (Mayer 2001; 2002; Moreno & Valdez 2005). Once again, the information selected never made it into the students short-term memory and

consequently never into the long-term memory for use in later situations (Baddeley, 1992; Bransford et. al., 1999; Whittrock, 1990).

Theme C – Information Integration

Without being able to define the terms and locate example in the songs provided on their own without the help of the teacher or the worksheet, students were not able to integrate the definitions and identifications into a paragraph explaining the purpose of using the poetic literary terms in the songs and poems. Multimedia learning theory states that when then goal of using multimedia technology in education is for integration and transfer of knowledge, then the learner must understand the information presented and at a later time be able to transfer the original information into a new situation (Mayer, 2001). In this study, students were not able to transfer the original information into new situations and therefore transfer did not occur despite the various learning strategies used in the WebQuest (Bransford et al., 1999).

Theme D – Transfer of Knowledge

WebQuests should inspire students to seek themes among the information gathered from website and then create projects and products that contribute to the real world of learning and allow students to reflect on their own metacognitive processes (Dodge, 2001; March, 2003). WebQuests require learners to take newly-acquired information and transform the information into authentic learning. Simply taking information from websites and putting the same information into a project does not allow the learner to transform the information into knowledge. March points out that "getting the information - the 'learning input' – is the easy part. The WebQuest gets trickier and more interesting in the next part, in which transformative learning takes place and

teachers and students can realize – or fail to realize – the potential of a WebQuest" (2003, p. 42).

Transfer is an important area in the field of cognitive science. Learning and transfer are central to cognitive science. Transfer goes beyond merely memorizing information to understanding the information; it includes a learner's ability to transfer what he or she has learned to new and different situations (Bransford, et al., 1999). The concept of transfer of learning is essential in determining if students are simply memorizing material or actually understanding the material. In order to determine if students are learning material presented in WebQuests, it is essential to see if the material can be transferred beyond the WebQuest. If students understand the material presented in the WebQuest, then they should be able to transfer that knowledge to other situations.

Students who initially reported that they had learned from the completion of the WebQuest changed their mind after being asked to integrate their learning into a new activity and were unable to do so. This lack of transfer of knowledge verifies the finding of the pre- and post-test data where students did not appear to have gained knowledge from the completion of the WebQuest. Motivation plays an important role in the learners' ability to transfer knowledge beyond simply memorizing (Bransford et al., 1999; Lambert & McCombs, 1998; McCombs, 1998).

Theme E – Student Reactions to the WebQuest

Motivation. Another area of focus for the field of cognitive science is motivation. Bransford et al. (1999) state that "motivation affects the amount of time that people are willing to devote to learning" (1999, p. 48). When learners see the usefulness of the task, they are more motivated to learn information. Motivation affects a learner's ability to

transfer knowledge beyond simply memorizing. Motivation is a principle of cognitive science that is a psychological factor of student learning. Motivation is intrinsic in learners depending upon learner beliefs, interests, emotions, and goals (Lambert & McCombs, 1998). Each learner has unique intellectual and physical capabilities which affect his or her level of motivation (McCombs, 1998). When learners are interested in learning and the learning leads to a goal, then motivation is high and learning occurs.

Motivation affects a learner's ability to transfer knowledge beyond simply memorizing (Bransford et al., 1999; Lambert & McCombs, 1998; McCombs, 1998). In this study, the students appeared to be motivated by the computers, not the desire to learn about poetic literary terms during the completion of the WebQuest. Therefore, the students had problems transferring knowledge from the WebQuest to the transfer activity because they were not motivated by learning, but instead by the use of computers.

Social Constructivism. Social constructivism recognizes that there is a reality; however, individuals do not necessarily know this reality. There are strong connections between social constructivism and John Dewey's work and philosophy (Prawat & Floden, 1994). Since the process and criteria used to evaluate knowledge is a social product, then depending upon the members of the group deciding upon which knowledge claims are valid, the accepted knowledge can change as group members change (Prawat & Floden, 1994). Instead of searching for correct subject-centered knowledge, social constructivism focuses on student-centered competencies. Knowledge is not one truth; instead it is a compilation of individual experiences. They can vary depending upon who is in the group, what the purpose of the group is, and the

environment in which the group exists (Bredo, 2000; Doolittle & Hicks, 2003; Philips, 1995; 2000; Prawat & Floden, 1994; Shapiro, 2003).

The social aspect of WebQuests raises a lot of interesting factors, including work load and unnecessary talking and socializing during the project that some students saw as a positive aspect of the project and others saw as negative aspects to the project being group-based. The social and individual experiences of learners play an important role in learning (Doolittle & Hicks, 2003). In this study, as in life, some students enjoyed having the opportunity to work with their peers, while others found it a burden to have to work in groups.

Theme F – The Teachers' Role in the WebQuest

The various levels of involvement by the teachers, whether extremely involved or not involved, provide another lens for examining the effectiveness of WebQuests on student learning. Teachers' perceptions of technology affect the amount of technology used in the classroom (McGee, 2000). Future research is needed to examine the effect of the teachers' involvement on student learning when using WebQuests and other technologies in the classroom.

Summary

Based upon the findings of this study, it is unclear as to whether or not WebQuests affect student learning, either positively or negatively. While the student scores did not change significantly, students did change their minds about their learning after being asked to complete a transfer activity. The students originally believed that they had learned a lot during the completion of the WebQuest; however, after not being able to complete the transfer activity, the students changed their minds and said that they

obviously had not learned the material. Students seemed to think that they had learned simply because they had completed the WebQuest, but realized that they had not retained any knowledge on the poetic literary terms presented in the WebQuest after failing to successfully apply the literary terms to a new poem. Motivation (Bransford et al., 1999; Lambert & McCombs, 1998; McCombs, 1998) is an important component of WebQuests. The question of are students motivated to learn because they are using computers comes into play with WebQuests. Students in this study appeared to enjoy being on the computer and said that they had learned, but when asked illustrate their learning through the completion of a transfer activity, the students had difficulties remembering what they had done during the WebQuest. It appears that the computers motivated students to complete the activity, but did not motivate the students to retain and integrate the knowledge in future situations.

WebQuests are traditionally designed with cognitive load theory in mind (Bransford et al., 1999). Through the use of scaffolded thinking and activities to help learners move from simply memorizing information, WebQuests try to move learners to more difficult and complex higher-thinking skills. However, in this study, students appeared to stay at the memorization level despite the scaffold activities provided by the WebQuest. Students were unable to complete the transfer activity because they did not integrate the information presented in the WebQuest into knowledge to be used later in different situations.

Implications

As more and new technologies enter into education, research is needed to ensure that the technologies being used in the classroom are helping, and not hindering student

learning. Teachers need to have empirical data on the types of technologies and technology applications introduced to them in their teacher education programs and in professional development. Technology needs to be used in classrooms only when it enhances learning, not just as a way to entertain students. Through empirical research, educators will begin to make informed decisions that impact their students and the learning that occurs in their classrooms. In order to ensure student success with technologies and technology applications, teachers need to make informed decisions about the incorporation of technologies. This study is the first step in the direction to providing teachers with the information they need to better integrate technology.

As the number of teachers who not only use, but also develop WebQuest increases, there is a need for more research to test the effectiveness of this technology application on student learning. This study provides a glimpse into the variety of factors (motivation, social constructivism, transfer of knowledge) that affect the quality of not only the WebQuest, but also of the knowledge that students are able to learn from the completion of the WebQuest.

Implications for WebQuest Developers and Users

Based upon the findings of this study, more research needs to be done in regards to students learning and WebQuests. WebQuest developers need to be aware of the goals of the WebQuest they are creating and if and how those goals are obtained by learners. Teachers who develop and use WebQuests in their classrooms need to focus on the needs of the students who will be using the WebQuest for learning, being sure to constantly evaluate if students are learning from doing the WebQuest, or simply having fun on the computer. Teachers and WebQuest developers need to carefully choose the topics for

WebQuests to ensure that higher-level thinking occurs during the completion of the WebQuest. By setting up WebQuests that are inquiry-based activities, as Dodge (1997) originally intended, students will use higher-level thinking skills during the WebQuests. The role that the teacher plays during the implementation of the WebQuest is important to examine. Teachers who are more comfortable with using technology and assisting students with technology may have better results using WebQuests in their classroom than their counterparts who do not feel comfortable with technology.

Implications for Teacher Education

This study has several implications for teacher education. Specifically in the area of what technology should be included in teacher education programs. There is a new trend in the area of educational technology that adds technology to Shulman's (1987) original knowledge base for teachers. Mishra and Koehler (2006) argue that Technological Pedagogical Content Knowledge (TPCK) needs to be added to the knowledge base. The acronym TPCK has recently been changed to TPACK (pronounced "tee-pack") to help emphasize the three kinds of knowledge should not be taken in isolation, but must all be present (Thompson & Mishra, 2007/2008). TPACK is the combination of content, pedagogy, and technology and how it is used in teaching (Mishra and Koehler, 2006). TPACK can be broken apart into pairs, pedagogical content knowledge (PCK), technological content knowledge (TCK), and technological pedagogical knowledge (TPK) and can also be taken together as technological pedagogical and content knowledge (TPACK) (Koehler, Mishra & Yahya, 2005; Mishra & Koehler, 2006, Thompson & Mishra, 2007/2008).

This new knowledge base brings to the forefront the need for teachers to be prepared to teach using technology. However, teacher education programs should ensure that the technological pedagogical content knowledge being taught has value and truly affects student learning. In the case of WebQuests, more research needs to be completed to allow for teacher education programs to make more informed decision about the inclusion of WebQuests as part of the technological pedagogical content knowledge taught. This study is a beginning step towards helping inform teacher education programs about the impact WebQuests have on student learning and therefore also helps to begin to answer the question of whether or not WebQuests should be included in the technological pedagogical content knowledge being taught.

Future Research

This study is the first step towards a better understanding of the effects of WebQuests on student learning. Additional research needs to be done in different subjects areas, with various grade levels, and a plethora of concepts in order to make a more informed decision about the effects of WebQuests on student learning. Multiple replications of this study should enable teachers to make an informed decision about the use of WebQuests in their classrooms.

Calls for research from Haertel and Means (2003); Bull et al. (2005) and Roblyer and Knezek (2003) provide the groundwork for future research focused on technology. Future research needs to use a multitude of data collection and data analysis techniques (both quantitative and qualitative). Additionally, research should focus on implementation of educational technologies and how to prepare teachers to use these

educational technologies. Finally, research that is easily replicable should be conducted so that the data can be generalized beyond the initial study.

This study responds directly to the above calls for research. Multiple data collection methods and data analysis techniques were used. Furthermore, this research study focused on classroom implementation of WebQuests and how student learning is affected by this technology application. Finally, this study responds directly to the call for studies which are replicable and generalizable. This study was designed so that it can be replicated with any WebQuest or other technology application. In order to create valid, reputable research studies, it is crucial to understand the criticism of educational technology and the research being done in regards to educational technology. Through the use of mixed-methods, this study illustrates the need for more in-depth research to see if WebQuests are a valid and authentic instructional tool to be used in classrooms. Furthermore, this research lays the groundwork for future research in the area of student learning and technology.

As a follow up to this study, I plan to examine different WebQuests in the various subject areas (including science, social studies, and mathematics) to see if WebQuests are better suited for certain subjects compared to others. I plan to implement a similar research design, but need to have a better method of quantitatively evaluating the effects of the WebQuest on student learning. By using a different type of pre-test and post-test, hopefully, I will be able to better evaluate if learning occurs during a WebQuest. The evaluation tool will be essential in the improvement of this study.

I also plan to explore other technology applications that are being used in classrooms today. One particular technology application is digital storytelling. Digital

storytelling is becoming more common in English and social studies classrooms and research needs to be done to evaluate the usefulness of this technology application.

Appendix A: Observation Protocol

Observation Protocol

1. How do students react to the WebQuest?
2. What methods are used to organize the information presented in the WebQuest?
3. What approach does the group take to complete the WebQuest?
4. What role does the teacher play in the completion of the WebQuest?

Appendix B: Student Focus Group Interview Protocol

A. Process of completing the WebQuest

1. What steps did you take in completion of the WebQuest?

B. Learning Outcomes

1. What did you learn from completing the WebQuest?
2. How did the WebQuest help in completing the final project?
3. Do you think the final project illustrates your understanding of the knowledge? Why?

C. Impact of other group members

1. How did your group work together to complete the WebQuest?
2. How did working in a group impact your learning?

D. Transfer of Knowledge

Students will be given a poem that they have not previously seen and asked to identify poetic literary terms used in the poem.

1. Based on this activity, do you think that you learned anything from the WebQuest?

Transfer Activity Worksheet

The Road Not Taken
by Robert Frost

Two roads diverged in a yellow wood,
And sorry I could not travel both
And be one traveler, long I stood
And looked down one as far as I could
To where it bent in the undergrowth;

Then took the other, as just as fair,
And having perhaps the better claim,
Because it was grassy and wanted wear;
Though as for that the passing there
Had worn them really about the same,

And both that morning equally lay
In leaves no step had trodden black.
Oh, I kept the first for another day!
Yet knowing how way leads on to way,
I doubted if I should ever come back.

I shall be telling this with a sigh
Somewhere ages and ages hence:
Two roads diverged in a wood, and I--
I took the one less traveled by,
And that has made all the difference.

Please write examples from the above poem in the below table.

Metaphor	
Purpose/Theme	
Mood	
Rhyme Scheme	
Tone	

Appendix C: Teacher Pre-WebQuest Interview Protocol

1. How have you previously used technology in this class?
2. Do you think that technology can affect student learning? How?
3. What do you know about WebQuests?
4. Do you believe WebQuests can affect student learning? How?

Appendix D: Teacher Post-WebQuest Interview Protocol

1. How did the WebQuest affect student learning?
2. Did the grouping of students affect the performance of individual students? How? Why?
3. Do you plan to use WebQuests again in the future? How? Why?

Appendix E: Pre- and Post-Test

How many professions do you know of that come with "how to" instructions? Read this poem that offers pointers and suggestions on how to be a poet and answer the questions that follow.

How To Be a Poet
(to remind myself)
by Wendell Berry

I

Make a place to sit down.
Sit down. Be quiet.
You must depend upon
affection, reading, knowledge,
skill – more of each
than you have – inspiration,
work, growing older, patience,
for patience joins time
to eternity. Any readers
who like your poems,
doubt their judgment.

II

Breathe with unconditional breath
the unconditioned air.
Shun electric wire.
Communicate slowly. Live
a three-dimensioned life;
stay away from screens.
Stay away from anything
that obscures the place it is in.
There are no unsacred places;
there are only sacred places
and desecrated places.

III

Accept what comes from silence.
Make the best you can of it.
Of the little words that come
out of the silence, like prayers
prayed back to the one who prays,
make a poem that does not disturb
the silence from which it came.

How To Be a Poet

1. Which of the following statements **best** expresses the theme of the poem?
   A. Create the space and time to appreciate life and find your own voice.
   B. Mistrust the opinion of others and the influence of technology.
   C. Stay in one place long enough to find your inspiration.
   D. Rely on the teachings of others to help you find your passion.

2. Throughout the poem, the poet uses imperative sentences such as "Sit down," "Be quiet," and "Communicate slowly," to emphasize which of the following?
   A. The poet's disregard for correct grammar
   B. The poet's arrogant, demanding tone
   C. The directions and guidance suggested by the poem's title
   D. The complex connection between the poet and the reader

3. How do the phrases "unconditional breath" and "three-dimensional life" **best** exemplify the advice the poet give in section II?
   A. Avoid crowded places
   B. Compose carefully and with feeling
   C. Find a sacred place to work
   D. Stay open-minded to fresh ideas

4. By telling the audience to "communicate slowly" in line 15, the poet is telling the reader to do which of the following?
   A. Breathe deeply
   B. Read each word carefully
   C. Express oneself deliberately
   D. Slow down one's speech

5. In line 14 in the expression "shun electric wire," the poet seems to be encouraging which of the following?
   A. Avoid the use of telephones
   B. Avoid the use of technology in general
   C. Use computers for Internet communication
   D. Use caution when working with electricity

6. The poet uses lines 9-11 to emphasize which of the following ideas?
   A. A poet's need to be continually reflective, even when praised
   B. A reader's superficial understanding of the poetry
   C. A poet's need to seek societal approval
   D. A reader's importance in deciding the fate of a poet

How do fruits and vegetables from a roadside stand stir and artist's imagination? Read the poem about some poets and painters and answer the questions that follow.

Art in America
by Maggie Anderson

Three of us, two poets and one painter,
drive out into clear autumn weather
to gather in some harvest
from the roadside stands
where the pumpkins are piled up
like huge orange marbles in the sun
and the gray Hubbard squash
are disguised as blue toy tops among
blueberries and jugs of apple cider.
We have to make our choices,
as in art, calculate the risk
of making them too ordinary, pale,
like a pool ball hit too thin
because we get afraid
when the table's so alive.
We risk bravado
(too many pumpkins, or too large)
and, since nothing's ever free,
we might have to put things back.
But today, we think we'll
get it right because
we're not alone
and we're laughing,
arguing a bit,
examining the vegetables,
and making up our minds, and
saying how we think we might
believe in the perfection
of common work among us.
What one of us does not get said,
the others will.

Art in America

7. Which of the following **best** expresses the theme of the poem?
   A. "We have to make our own choices"
   B. "calculate the risk/of making them too ordinary"
   C. "because we get afraid"
   D. "But today, we think we'll/get it right because/we're not alone"

8. Which of the following **best** describes the tone of the selection?
   A. Bittersweet
   B. Humorous
   C. Playful
   D. Regretful

9. What effect does the author achieve with the imagery used in lines 5-9?
   A. Appealing the senses in anticipation of a freshly-cooked meal
   B. Showing readers how ordinary objects can be used to create works of art
   C. Showing that vegetables and toys are important in our lives
   D. Creating a peaceful foam scene to compare to a hectic city scene

10. What does the poet mean when she writes, "We also risk bravado" in line 16?
   A. The artists may be overly ambitious in their enthusiasm.
   B. The artists may carelessly endanger their safety.
   C. The artists may appear too greedy and full of themselves.
   D. The artists may let their arguments interfere with their friendships.

11. The use of parallel verbs in lines 23-27 emphasizes which of the following?
   A. The human processes involved in creating art
   B. What the artists do together in the autumn
   C. The details of buying good fruit
   D. That art is defined by the individual

12. What does the poet suggest by using the title "Art in America"?
   A. Art is a national treasure and should be respected.
   B. Art is a product of both nature and community.
   C. Art may change according to different people's opinions.
   D. Art involves difficult decisions and hard work.

Appendix F: WebQuest

Introduction

You're Hired!!!

Music is all around you. You listen to music everyday and enjoy what you listen to! These skills make you perfect for the job.

You and team have been hired by Big Shot, the head of a major record company to help identify poetic techniques that appear popular songs. This is an important position because the music industry has begun to market music to schools specifically because music helps students understand poetry better. Big Shot is expecting your team to work hard to complete this important task!

Click on the 'Task' link to receive further instructions.

Task

MEMO

To: Poetry Device Finding Team

From: Big Shot, Head of Record Company

You and your team have been assigned to review important poetic devices, identify these poetic devices in several songs and finally to write your own song/poem which contains at least three poetic devices.

If you are ready to get started, click on the 'Process' link.

Good luck!

Process

PART ONE

As a team, please review the following poetic terms to assist you in completion of your task for the record company.

Simile

Metaphor

Personification

Imagery

Tone

Purpose/Theme

Mood and Meaning

Rhyme Scheme

PART TWO

Now that you and your team are familiar with the different poetic terms that the record company wants you to look for, it is time to get to work finding the poetic devices in the following songs. Below you will find links to three different songs. On a sheet a paper, identify any and all poetic devices that you find in the song. As a group, decide the purpose/theme, tone, mood and rhyme scheme for each song and record your answers. Be sure to save your answers for the final project!

Song One:

The River by Garth Brooks

Hint: there are similes and metaphors in this song

Song Two:

Legend of Wooley Swamp by Charlie Daniels

Hint: look for personification and imagery

Song Three:

Stairway to Heaven by Led Zeppelin

Hint: there is a metaphor here and imagery

After you have completed parts one and two as a team, you will complete part three individually.

PART THREE

Individually, you will create a song booklet for poetic devices used in music.

Step One: Copy the lyrics from two of the above songs into your booklet. Identify any poetic devices used in each of the songs and write a short description (approximately 50 words) of the purpose/theme, tone, mood and rhyme scheme for each of the chosen songs.

Step Two: Choose an additional song to include in your booklet. (NOTE: Songs may NOT contain profanity or inappropriate content!) Identify any poetic devices used in the song and write a short description of the purpose, tone, mood, and rhyme scheme for the two songs you choose.

Step Three: Write your own music lyrics/poem. Use at least two of the above poetic devices in your song (i.e. personification; simile; metaphor; imagery) and write a short description of the purpose/theme, tone, mood and rhyme scheme for your song.

Step Four: Create a front and back cover for you booklet. Assemble your booklet, being sure to include a table of contents for the booklet. (See the 'Evaluation' link for the grading rubric for this project.)

Click on 'Conclusion' link for final words from your boss.

Conclusion

Memo

To: Poetry Device Finding Team

From: Big Shot, Head of Record Company

Thank you for you and your teams hard work on finding poetic devices in some of our label's music.

Do not forget to turn your song booklet in so that we can evaluate your work. Also, your original songs will be considered by some of our top artists for recording in the future.

Good work team!!

Evaluation

You will be evaluated on the final project according to the following rubric.

CATEGORY	**4** (Excellent)	**3** (Good)	**2** (Fair)	**1** (Poor)
Songs	Student correctly identified poetic devices used four songs.	Student correctly identified at least three poetic devices in the four songs.	Student correctly identified at least two poetic devices in four of the songs.	Student correctly identified poetic devices in one of the four songs.
Poetic Devices	All songs demonstrate at least one example of correctly identified Poetic Device.	Four songs contain an example of correctly identified Poetic Device.	Three songs contain an example of correctly identified Poetic Device.	Two or less songs contain an example of identified used Poetic Device.
Original Song/Poem	Student correctly identified at least two poetic devices in the song and had an accurate description of the tone, mood, purpose/theme and rhyme scheme of the song.	Student correctly identified at least two poetic devices in the song and had an accurate description of the at least three of the following: tone, mood, purpose/ theme and rhyme scheme of the song.	Student correctly identified at least one poetic device in the song and had an accurate description of at least two of the following: the tone, mood, purpose/theme and rhyme scheme of the song.	Student correctly identified at least one poetic device in the song and had an accurate description of at least one of the following: the tone, mood, purpose/theme and rhyme scheme of the song.
Presentation	All five songs/poems are compiled within a neat, creative book including a title and name of lyricist for each song/poem and	Four of the songs/poems are included in a creative book including title and name lyricists for each song/poem and explanation of poetic devices.	Only three of the songs/poems are included in a creative book including title and name of lyricist for each song/poem	Two or less songs/poems presented in a creative book including a title and name of lyricist for each song/poem and explanation of

	explanation of poetic devices.		and explanation of poetic devices.	poetic devices.
Grammar and Structural Form	Explanations of poetic devices (including tone; mood; purpose/theme and rhyme scheme) for songs/poems reflect correct grammatical and structural form.	Explanations of poetic devices (including tone; mood; purpose/theme and rhyme scheme) for songs/poems contain grammatical or structural errors in one or two.	Explanations of poetic devices (including tone; mood; purpose/theme and rhyme scheme) for songs/poems contain grammatical or structural errors in three or four.	Explanations of poetic devices (including tone; mood; purpose/theme and rhyme scheme) for songs/poems contain grammatical or structural errors in all explanations.

Resources

RESOURCES:

Use the below resources to help better understand the various poetic devices.

RHYME SCHEME

http://en.wikipedia.org/wiki/Rhyme_scheme

http://www.tnellen.com/cybereng/lit_terms/rhyme_scheme.html

http://www.mca.k12.nf.ca/subpro4.htm

SIMILE

http://en.wikipedia.org/wiki/Simile

http://www.tnellen.com/cybereng/lit_terms/simile.html

http://library.thinkquest.org/J0112392/simile.html

METAPHOR

http://en.wikipedia.org/wiki/Metaphor

http://www.tnellen.com/cybereng/lit_terms/metaphor.html

http://www.sil.org/linguistics/GlossaryofLinguisticTerms/WhatIsAMetaphor.htm

PERSONIFICATION

http://en.wikipedia.org/wiki/Personification

http://www.tnellen.com/cybereng/lit_terms/personification.html

http://www.imschools.org/cms/Units/Poetry/personif.htm

IMAGERY

http://textetc.com/traditional/imagery.html

http://en.wikipedia.org/wiki/Imagery

http://volweb.utk.edu/school/bedford/harrisms/imagery.htm

TONE

http://bcs.bedfordstmartins.com/virtualit/poetry/tone_def.html

http://www.clas.ufl.edu/users/pcraddoc/mwtone.htm

http://www.cnr.edu/home/bmcmanus/tone.html

PURPOSE and THEME

http://anitraweb.org/kalliope/why.html

http://web.mit.edu/lit/www/dutchiamb/purpose.html

http://www.manassas.k12.va.us/round/ClassWeb/Slough/Poetry/aboutpoetry.htm

http://litera1no4.tripod.com/themepoetry_frame.html

http://www.poetryarchive.org/poetryarchive/themes.do

MOOD and MEANING

http://library.thinkquest.org/CR0210243/Language%20Arts%20Lagoon/Literature/mood%20and%20meaning%20in%20poetry.htm

http://volweb.utk.edu/Schools/bedford/harrisms/lesson17.htm

Appendix G: WebQuest Student Worksheet

You're Hired
Poetry WebQuest Answer Sheet

Part One
Please write a definition for the following poetic literary terms in your own words:

Term	Your Definition
Simile	
Metaphor	
Personification	
Imagery	
Tone	
Purpose/Theme	
Mood/Meaning	
Rhyme Scheme	

Part Two
For each of the three songs, identify and explain the following literary terms

Song One: *The River* by Garth Brooks

Simile	
Metaphor	

Purpose/Theme	
Mood	
Rhyme Scheme	

Song Two: *Legend of Wooley Swamp* by Charlie Daniels

Personification	
Imagery	
Purpose/Theme	
Mood	
Rhyme Scheme	

Song Three: *Stairway to Heaven* by Led Zeppelin

Metaphor	
Imagery	
Purpose/Theme	
Mood	
Rhyme Scheme	

Turn this sheet in along with your final poetry booklet.

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