DIFFERENTIAL EFFECTIVENESS OF TWO SCAFFOLDING METHODS FOR WEB EVALUATION ACHIEVEMENT AND RETENTION IN HIGH SCHOOL STUDENTS

A dissertation submitted to the
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There is general acknowledgment on the positive effects of scaffolding on student learning. Yet, does the teacher have to mediate the scaffolding or can it be as effective if mediated by technology?

This study addresses the need for library media specialists to teach students in the most effective and efficient manner in a limited time frame. The results of a quasi-experiment research design examines different deliveries of scaffolding: (a) a teacher mediated scaffold lesson that demanded 60 minutes of the librarian’s undivided attention; (b) a technology mediated scaffold lesson that demanded 20 minutes of the librarian’s undivided attention; and (c) a nonscaffolded group that required 5 minutes of the librarian’s undivided attention. Participants included 73 (35 female and 38 male) 10th-grade health students from a predominately White suburban high school. All three groups covered the same material, worked collaboratively, and the end project requiring citations remained the same. Lessons addressed the need for students to evaluate resources on the Internet. Websites used for student research were scored for quality using a rubric. The three groups were involved in five research projects spaced 2 weeks apart. The lessons were implemented after their first project to obtain a baseline. The website evaluation
scores from all research projects were assessed for quality to see if task achievement and longevity was achieved.

Results showed the two groups that received some form of scaffolding instruction did not differ significantly from each other but each differed significantly on their web evaluation achievement and longevity scores from the nonscaffolded group. Gender, grade point average, race, and education program did not have an effect on scores.
DEDICATION

I would like to dedicate this dissertation to the men and women in the United States Military who are serving or have served in Iraq; in particular that special soldier who whenever he could get to a phone would ask, “How is your dissertation coming along, Mom?”
ACKNOWLEDGMENTS

This dissertation could not have been completed without the support of many individuals. I would like to thank my co-directors, Dr. Albert Ingram and Dr. Cindy Kovalik, and committee member, Dr. Carolyn Brodie, for their patience, suggestions, and guidance during this long road to completion. A sincere thank you goes to Dr. David Dalton for his assistance and advice during my doctoral program.

To my family, especially Doug, thank you for understanding that academic concerns took precedence over others.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEDICATION</td>
<td>v</td>
</tr>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td>vi</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>xii</td>
</tr>
<tr>
<td>CHAPTER</td>
<td></td>
</tr>
<tr>
<td>I. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Purpose Statement</td>
<td>4</td>
</tr>
<tr>
<td>Significance</td>
<td>4</td>
</tr>
<tr>
<td>Questions</td>
<td>5</td>
</tr>
<tr>
<td>Definitions</td>
<td>5</td>
</tr>
<tr>
<td>Limitations</td>
<td>6</td>
</tr>
<tr>
<td>II. REVIEW OF LITERATURE</td>
<td>7</td>
</tr>
<tr>
<td>Theoretical Foundation</td>
<td>7</td>
</tr>
<tr>
<td>Scaffolding</td>
<td>10</td>
</tr>
<tr>
<td>The Tutor’s Role in Scaffolding</td>
<td>13</td>
</tr>
<tr>
<td>Scaffolding in the Classroom</td>
<td>17</td>
</tr>
<tr>
<td>Software and Web-Based Scaffolding</td>
<td>22</td>
</tr>
<tr>
<td>WebQuests as a Scaffolded Learning Device</td>
<td>27</td>
</tr>
<tr>
<td>Evaluation of Websites</td>
<td>35</td>
</tr>
</tbody>
</table>
Teacher Scaffolded: Week 7 ................................................................. 64
Teacher Scaffolded: Week 8 ................................................................. 64
Teacher Scaffolded: Week 9 ................................................................. 65
Web Scaffolded Group Procedure .......................................................... 65
Web Scaffolded: Week 1 ................................................................. 65
Web Scaffolded: Week 2 ................................................................. 66
Web Scaffolded: Week 3 ................................................................. 69
Web Scaffolded: Week 4 ................................................................. 70
Web Scaffolded: Week 5 ................................................................. 70
Web Scaffolded: Week 6 ................................................................. 71
Web Scaffolded: Week 7 ................................................................. 71
Web Scaffolded: Week 8 ................................................................. 72
Web Scaffolded: Week 9 ................................................................. 72
Nonscaffolded Group Procedure .......................................................... 73
Nonscaffolded Group: Week 1 ............................................................. 73
Nonscaffolded Group: Week 2 ............................................................. 74
Nonscaffolded Group: Week 3 ............................................................. 74
Nonscaffolded Group: Week 4 ............................................................. 75
Nonscaffolded Group: Week 5 ............................................................. 75
Nonscaffolded Group: Week 6 ............................................................. 76
Nonscaffolded Group: Week 7 ............................................................. 76
Nonscaffolded Group: Week 8 ............................................................. 77
APPENDIX F: EVALUATING SITES TASK ASSESSMENT FORM ............ 128

APPENDIX G: NINTH GRADE LESSON PLAN ........................................ 130

APPENDIX H: ANALYSIS OF VARIANCE FOR GPA WITH OUTLIER ELIMINATED ................................................................. 135

APPENDIX I: ANALYSIS OF VARIANCE FOR WEB EVALUATION SCORES ...................................................................................... 137

APPENDIX J: MULIPLE COMPARISONS SCHEFFE OF TEACHER SCAFFOLDED (TS), WEB SCAFFOLDED (WS), AND NONSCAFFOLDED GROUPS .......................................................... 139

REFERENCES ....................................................................................... 142
<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Demographic Statistics of Student Participation</td>
<td>52</td>
</tr>
<tr>
<td>2. Assignments, Websites, and Scaffolding Used in the Three Groups</td>
<td>79</td>
</tr>
<tr>
<td>3. Delivery Methods of Teacher Scaffolded (TS) and Web Scaffolded</td>
<td></td>
</tr>
<tr>
<td>(WS) Groups</td>
<td>84</td>
</tr>
<tr>
<td>4. Analysis of Covariance for Pretest Scores</td>
<td>88</td>
</tr>
<tr>
<td>5. Descriptive Statistics for Week 3 Web Evaluation Scores</td>
<td>89</td>
</tr>
<tr>
<td>6. Analysis of Variance for Week 3 Web Evaluation Scores</td>
<td>90</td>
</tr>
<tr>
<td>7. Descriptive Statistics for Nonscaffolded (NS), Teacher Scaffolded (TS), and Web Scaffolded (WS) Groups</td>
<td>91</td>
</tr>
<tr>
<td>8. Descriptive Statistics for Efficiency of Scaffolding Strategies</td>
<td>94</td>
</tr>
<tr>
<td>9. Analysis of Variance for Efficiency of Scaffolding Strategies</td>
<td>94</td>
</tr>
</tbody>
</table>
CHAPTER I
INTRODUCTION

Since the September 2004 passage of the Ohio Department of Education Guidelines for Effective School Library Media Programs, school library media specialists across the state have become accountable for teaching information, technology, and media literacy skills. Five months prior to this act it was reported that there was a $107 million shortfall in the state’s education funding for the current fiscal year. This news led to a desperate attempt by school districts across the state of Ohio to streamline their budgets. Cuts included certified library media specialists, library aides, and library resources (Arnett, 2005; Brown, 2006; Burkholder, 2006; Douglas, 2006; Krantz, 2005, 2006). How does the school library media specialist remain an effective and efficient teacher, a provider of information access and delivery, and a program administrator with limited resources?

The lack of school library funding is not limited to the state of Ohio. School Library Journal includes many articles such as the following; “Boston Suburb Slashes Staffing,” “Des Moines Parents Sub for Library Media Specialists,” “Utah District Phases Out K-8 Library Media Specialists,” and “WV School Library Media Specialists May Get the Ax” (Barack, 2005b, 2005c, 2006; Whelan, 2006). The No Child Left Behind Act classifies school library media specialists as support staff and their positions are frequently targeted for elimination even though many studies have found a correlation
between the school library and student achievement. A study (Todd & Kuhlthau, 2004) surveyed 13,000 students and 900 teachers on how their school libraries helped them. The significant finding in the study stated that the school library was essential to student achievement. The school libraries surveyed were chosen because they engaged in best practices for information literacy. Information literacy is defined as the ability to (a) assess information efficiently and effectively, (b) evaluate information critically and competently, and (c) use information accurately and creatively (Ohio Department of Education, 2003).

Another information literacy survey administered to 126 school library media specialists in 18 countries and 131 schools that served over 113,260 students provided a global perspective to techniques used to facilitate information literacy (Danley, Forde, Lahmon, & Maddux, 1999). The respondents saw themselves as facilitators with a constructivist’s perspective of learning. Those surveyed identified characteristics such as safe environments for sharing ideas, coaching students by questioning, prompting, and encouraging students to become independent information seekers as essential elements in a library program. Respondents also believed that effective school libraries require adequate aides and up-to-date equipment.

Haycock’s report (2003) delineated the importance of constructivism in providing meaningful, authentic learning activities to facilitate learners acquiring new knowledge in information literacy. Learning outcomes achieved in the school library were broken down into the following components: information outcomes and skills, mastery of networked information technology, reading, mastery of content, development of personal...
perspectives and viewpoints, and independent learning strategies. After investigating the results of multiple studies, predominately those of Lance and Todd, Haycock determined that library media specialists who use a constructivist instructional design are more successful in student information literacy achievement.

Lance (2002) completed six statewide studies on the impact of school library media programs on the academic achievement of U.S. public school students. The Iowa Tests of Basic Skills results in each school were correlated with school library media staffing levels, activities of the library media specialist, collection counts and usage statistics. Lance’s findings suggest that (a) effective librarians improve student performance on achievement tests, (b) library media specialists are more effective with support staff, (c) library media specialists generally instruct both students and in-service teachers, and (d) effective library media specialists must embrace technology. Lance’s findings were part of the nationwide White House Conference on School libraries that recognized the mounting evidence of the importance of a strong school library media program (Bush et al., 2002).

Although there is considerable evidence (Bush et al., 2002; Fitzgerald et al., 2003; Lance, 2002; Todd, 2002; Todd & Kuhlthau, 2004) that school library media specialists may have a significant impact on student achievement, little practical advice is provided to the school library media specialist on how to implement effective teaching strategies, especially in the wake of budget cuts. This dearth of information is frustrating to library media specialists striving for data driven decisions about improving academic achievement. The above studies’ findings reveal that a constructivist approach to teaching
information literacy skills is significantly more successful in student achievement than a more traditional approach. However, the instructional design of information literacy lessons is not addressed. There is a need for empirical studies that give the school library media specialist guidance on how he or she can engage students successfully with limited resources. The current study will investigate a component of constructivism, scaffolding, and its impact on teaching students to evaluate information critically and competently.

Purpose Statement

The purpose of this study is to explore the impact of different scaffolding techniques on 10th-grade health students’ evaluation of websites. In the context of this study, scaffolding means the externalized support that facilitates both cognitive and metacognitive processes used to improve student task achievement. This study examines both students’ success in evaluating websites and the support time required by the school library media specialist in implementing each scaffolding approach.

Significance

This study provides useful information to school library media specialists, teachers, and administrators regarding the use of constructivist approaches to information literacy instruction. In the context of this study, constructivism is defined as the belief that children must form their own understanding of the world in which they live. Adults help guide this knowledge construction by providing structure and support.
Questions

The following research questions guided this research:

Question 1: Which scaffolding treatment - teacher scaffolded or web scaffolded - leads to the selection of the best websites?

Question 2: Which scaffolding method - teacher scaffolded or web scaffolded - produces the greatest retention of web evaluation skills?

Question 3: Which group scaffolding - teacher scaffolded or web scaffolded - is more efficient?

Definitions

Constructivism: Constructivism is a theory that holds by reflecting on our experiences, we construct our own understanding of the world we live in. Learning is then the process of adjusting our mental understandings to accommodate new experiences.

Information literacy:

Standard 1: The student who is information literate accesses information efficiently and effectively.

Standard 2: The student who is information literate evaluates information critically and competently.

Standard 3: The student who is information literate uses information accurately and creatively. (American Association of School Librarians (AASL) and Association for Educational Communications and Technology (AECT) 1998).
**Instructional design:** Instructional design (ID) is a system of procedures for developing education and training programs in a consistent and reliable fashion. ID is a complex process that is creative, active, and iterative (Reiser and Dempsey, 2002).

**Library media center:** The school library that provides a variety of services (instruction, collaboration, circulating resources) to the students and staff of a school.

**Scaffolding:** The externalized support, through either social interaction or the use of technology, that is provided to the student by an instructor or tutor. This externalized support, or scaffold, enables students to complete a task that would be beyond their unassisted efforts, leading to greater learning.

**School library media specialist:** The teacher working in the library media center who also holds a degree in library science and is certified to teach information literacy skills.

**Scores:** Web evaluation score of 0-8 determined by a rubric.

**Limitations**

Limitations of this study included the demographic restrictedness of the sample, and the nonrepresentation of students in urban and rural settings and different age groups. Therefore, the results of this study may not be generalized beyond the specific population that were the subjects.

Another limitation is that retention refers to a nine week period in which the sample groups’ web evaluation scores were tracked.
CHAPTER II

REVIEW OF LITERATURE

This study examines the effects of different scaffolding strategies in teaching students information literacy in the context of a school library media center. Literature discussed in this chapter deduces that information literacy is best learned when students actively strive to construct meaning from sources encountered and then to create products to communicate that meaning effectively. This chapter reviews literature on the educational theory underlying scaffolding and specific elements of scaffolding. Next, empirical studies on website evaluation and then more specifically health websites are explored. The purpose of this review is to provide an awareness of the previous research in this area, as well as to provide a rationale for the choice of variables in the present study.

Theoretical Foundation

Just as many school library media centers have moved far beyond a room with books to become an active, technology-rich learning environment with an array of information resources, the school library media specialist today focuses on the process of learning rather than dissemination of information (Information Power, 1998). Many believe that the most effective approach to teaching information literacy skills is that of constructivism as acknowledged in Information Power. Byerly and Brodie (1999) state:
The behaviorist teaching philosophy has been replaced or modified to incorporate a constructivist approach, in which students construct their own understanding by active investigation and thought, instead of memorizing facts presented in a class lecture. This has resulted in the concepts of resource-based learning, discovered information, and inquiry-based instruction. (p. 57)

*Information Power* (1998) states that constructivism “places the learner at the center of a dynamic learning process; the learner constructs knowledge rather than passively absorbing it,” as is done in an instructivist perspective where the student is dependent on adults' instruction in academic knowledge and skills (Katz, 1996).

The constructivist approach to learning is theoretically grounded on Piaget’s (1954) and Vygotsky’s development research (Vygotsky, 1978). Constructivists posit that children must discover their own meaning about the world in which they live. Adults aid this knowledge construction by providing structure and support. Piaget believed that at all stages of development, the learner will interact with the environment and construct knowledge. However, Vygotsky placed a strong emphasis on social interactions. Unlike Piaget, Vygotsky did not place much importance on the child’s “stage” of development. Aware that learning takes place in social settings, Vygotsky was more interested in the learning potential that a child might have and what the child might accomplish with the guidance of adults or older peers (Vygotsky, 1978). According to Vygotsky’s models, knowledge is not individually constructed, but co-constructed between two people. Remembering, problem solving, planning, and abstract thinking have a social origin.
In Vygotsky’s theory, elementary mental functions are transformed into higher cognitive functions through interactions with more informed adults and peers. Internalization refers to the process of constructing an internal representation of physical actions or mental operations that begin in social interactions. Through internalizing elements of social interactions, children develop ways of adapting their own behavior and thinking. Vygotsky also recognized that a key factor in social learning is the art of imitation. Interacting with adults and peers in cooperative social settings gives the learner opportunities to observe, imitate, and subsequently develop higher mental functions.

Vygotsky defined the “zone of proximal development” as the difference between what children can do on their own and what they can do with the support of others. If an adult or peer carefully provides an appropriate level of support and guidance, children are generally able to perform at a higher level than they can perform on their own. As a result of his studies, Vygotsky believed that interactions with adults and peers in the zone of proximal development helps children move to higher levels of mental functioning (Meece, 1997).

In a constructivist classroom situation, the zone of proximal development is determined by the student’s developmental levels and the structure of instruction. Instruction proceeds developmentally so that students are accomplishing tasks they would be unable to do alone. Each student’s range of potential for achievement is crafted by the social environment. Assistance designed to promote skill attainment in the zone of proximal development is called scaffolding (Roehler & Cantlon, 1997).
Scaffolding

Wood, Bruner, and Ross (1976) coined the term “scaffolding.” They differentiate between the learner solving problems and acquiring skills unassisted and the learner’s problem solving and skill acquisition being aided by a tutor.

More often than not, it (tutoring) involves a kind of “scaffolding” process that enables a child or novice to solve a problem, carry out a task or achieve a goal which would be beyond his unassisted efforts. This scaffolding consists essentially of the adult ‘controlling’ those elements of the task that are initially beyond the learner’s capacity, thus permitting him to concentrate upon and complete only those elements that are within his range of competence. The task thus proceeds to a successful conclusion. We assume, however, that the process can potentially achieve more for the learner than an unassisted completion of the task. It may result, eventually, in development of task competence by the learner at a pace that would far outstrip his unassisted efforts. (p. 90)

A student can accomplish a skill with the aid of an adult or peer that he may not be able to do on his own, and the support can be removed when no longer needed (Greenfield, 1999). The analogy of the scaffold was used because it includes five critical elements. According to Greenfield:

The scaffold, as it is known in building construction, has five characteristics: it provides a support; it functions as a tool; it extends the range of the worker; it allows a worker to accomplish a task not otherwise possible; and it is used to selectively aid the worker where needed. (p. 98)
Lepper, Drake, and O’Donnell-Johnson (1997) add to the analogy by describing a temporary structure supporting a tunnel or bridge as it is being constructed. When this temporary support is removed, the tunnel or bridge can stand on its own. In other words, the learner can perform independently after the scaffold is removed.

Scaffolds can be used to teach all skills, but scaffolds are especially effective in teaching higher-level cognitive strategies, since many of the necessary steps or procedures to achieve a skill cannot be specified (Rosenshine & Meister, 1992). Rather than enumerating specific steps, one scaffolds learners as they attempt a specific skill. Rosenshine and Meister articulated scaffolding steps to teach higher-order cognitive strategies. These steps were used in the current study:

1. Present the new cognitive strategies
   a. Introduce the concrete prompt
   b. Model the skill
   c. Think aloud as choices are made

2. Regulate difficulty during the guided practice
   a. Start with simplified material and gradually increase the complexity of the task
   b. Complete part of the task for the student
   c. Provide cue cards
   d. Present the material in small steps

3. Provide varying contexts for student practice
   a. Provide teacher-led practice
b. Engage in reciprocal teaching

c. Have students work in small groups

4. Provide feedback
   a. Offer teacher-led feedback
   b. Provide checklists
   c. Provide models of expert work

5. Increase student responsibility
   a. Diminish prompts and models
   b. Gradually increase complexity
   c. Diminish student support

6. Provide independent practice
   a. Provide extensive practice
   b. Facilitate application to new examples. (p. 27)

Scaffolding can be accomplished with a tutor who interacts with the learner with dialogue, an important feature of scaffolding (Edwards & Mercer, 1994; Wells, 2002). Palinscar (1986) stated that dialogue is the means by which support is provided and adjusted, and it serves the function of “facilitating the collaboration between the novice and expert for the novice to acquire the cognitive strategy or strategies” (p. 75). When the term scaffolding was introduced by Wood et al. (1976), it was used to describe the support given by the tutor in one-on-one interactions. The following section further defines specific elements of scaffolding when a tutor is involved.
The Tutor’s Role in Scaffolding

Lepper et al. (1997) conducted a study to identify overall goals, general strategies, and specific motivational and instructional techniques of expert and effective human tutors. To locate tutors for the study, Lepper and his colleagues asked schools and tutoring agencies to identify expert tutors. These tutors engaged in a series of individual tutoring sessions that were videotaped in laboratory conditions. Variability in tutor success, defined by students completing specific tasks, was used to identify effective goals, strategies, and techniques. Results of the study led to the creation of the acronym INSPIRE for summarizing the scaffolding techniques of expert tutors:

Intelligent, Nurturant, Socratic, Progressive, Indirect, Reflective, and Encouraging (Lepper et al., 1997).

The scaffolding techniques of expert tutors all include dialogue. Using their intelligence, the most effective tutors were able to draw from a broad range of analogies and metaphors for further explanations and examples of difficult concepts. Expert tutors nurture the relationship with students by asking about family, school, and interests and then refer to that personal information during the course of the session. Using the Socratic style of tutoring, expert tutors rely on questioning rather than lecture. This same questioning technique can be used for progressive strategies to make increasing demands on the student. Indirect comments may be used for both positive and negative feedback such as “Which number did you really want to use?” which implies something is wrong but does not come out and directly say, “Your answer is wrong.” During the reflective stage, students are encouraged to articulate the reasoning and meaning underlying their
answers. Finally, verbal *encouragement* and motivation are given a great deal of attention by the most effective tutors. Unfortunately, most school environments are not set up for one-on-one tutor/student interactions. Because other students are more readily available in a school setting than tutors, investigations of peer tutoring, a scaffolding device, are explored in this chapter.

Alison King (1997) developed the “ASK to THINK-TEL WHY” model using dialogue as the key component in peer tutoring for scaffolding higher levels of complex learning. King recognized that as public school class size and diversity increase, teachers are challenged to meet the needs of individual students. Peer-mediated learning can contribute to solving this problem. According to King, true scaffolded peer tutoring must ensure that the tutor and tutee have the same status and are actual peers in both age and ability. Many researchers have conducted experimental studies to determine factors that positively affect tutoring outcomes such as (a) structure of the tutorial interaction (including specific tutor behaviors), (b) degree of student control or regulation of the process, and (c) status within the tutor-tutee relationship (Fantuzzo, Dimeff, & Fox, 1989; Fuchs, Fuchs, Bentz, Phillips, & Hamlett, 1994; Greenwood, Delquadri, & Hall, 1989; Kuti, Hinton, Fitch, & Semb, 1992).

Forms of dialogue are the core components of effective tutor behaviors. King (1997) defined these types of dialogues as supportive communication (listening attentively, allowing thinking time, and encouragement), elaborated explanation, and questioning. Using these components, King created the “ASK to THINK-TEL WHY” model designed to utilize reciprocal tutor-tutee roles to construct new knowledge.
Because these components were used in the current study, they will be described in greater detail in chapter 3.

When in the tutoring role, students learn to use different kinds of questions to prompt their partners to make corresponding responses. Tutors also learn to sequence their questioning in a particular way. Thus, during this transactive process, partners scaffolded each other’s thinking and learning to progressively higher levels (p.221).

In another study, King (1992) took questioning to a higher level by guiding students to generate questions to elaborate on new material in an effort to facilitate learning. She defined elaboration as adding new facts to the information, clarifying an idea, explaining relationships, making inferences, visualizing an image of some detail of the material, and applying an analogy relating the new ideas to familiar things (pp. 111-112). Using high school and college students in naturalistic settings, she compared results of three groups who used (a) guided student-generated questioning, (b) discussion, and (c) independent review of material presented in lecture format. Students in the guided student-generated questioning were provided with generic question stems based on the higher levels of Bloom’s (1984) taxonomy: application, analysis, and evaluation. Each student listened to the lecture, worked independently on questions, and then in a small cooperative group, took turns posing and answering each other’s questions.

Results from King’s (1992) study indicate the guided student-generated group performed better than the other two groups. This strategy encouraged students to ask thought-provoking questions and generate elaborate explanations, and these verbal
behaviors led to improved comprehension. This study affirms the importance of including a scaffold (the generic question stems) in the instructional plan.

Peer tutoring interactions were also investigated by Ge & Land (2004). Question prompts and peer interactions were used as the conceptual framework for identifying scaffolding techniques. Ge and Land inspected previous scaffolding research and theory and formed conclusions supporting the inclusion of question prompts and peer interactions as scaffolding strategies in solving ill-structured (real world) problems. Their conclusions resulted in the following guidelines for instructional design practice.

**Guideline 1:** *Elicit questions from content-domain experts when developing question prompts.* It is important to use content experts as a model for novice learners. Instructional designers should include authentic questions from these content experts in the instructional plan.

**Guideline 2:** *Develop specific questions to prompt desired cognitive and metacognitive activities and to address student misconceptions and difficulties.* Different problem solving-processes require different question prompts. For example, a justification problem solving process can be aided by question such as: “What is your chain of reasoning for selecting that solution?” or an evaluating problem solving process aided by asking “What are the pros and cons of the solution?” This article provided a table for instructional designers and teachers to assist in composing questions.

**Guideline 3:** *Adjust levels of scaffolding and help students to internalize the question-asking strategy.* Questions prompts serve not only as a guide to student
problem-solving processes, but also as a model for metacognitive strategies to solve future problems.

Guideline 4: Extend the means of scaffolding by designing and embedding question prompts in educational computer programs. Instructional designers need to include embedded question prompts in computer-supported learning environments to engage students in problem solving.

Guideline 5: Engage students in high-level discourse for meaningful and constructive peer interactions using various tools or strategies. Complex learning requires thought-provoking questions, explanations, speculations, justifications, inferences, hypotheses, and conclusions. It is important to provide students with a guide, such as the one utilized in the current study, to achieve this.

Since the development of the scaffolding analogy, the term has been expanded to include other forms of support to aid students in a large group setting. In view of the fact that classroom reality demands alternative teaching techniques other than one-on-one tutoring, other forms of scaffolding are explored.

Scaffolding in the Classroom

The definition of scaffolding has evolved from the interaction between tutor (either adult or peer) and student to the design of tools to support student learning in project-based and design-based classrooms (Puntambekar & Hübscher, 2005). Puntambekar’s defined critical elements of scaffolding—ongoing assessment, graduated assistance, and fading—that are important in the classroom environment. The communication between the teacher and learner enable the teacher to continuously assess
the learner’s comprehension, provide proper support, and eventually remove the support so the learner can complete the task on his own.

Hogan and Pressley (1997) explored the challenges of scaffolding in the classroom setting. They offered several solutions for scaffolding with large classes. Students may be organized in groups so the groups are scaffolded rather than individuals. Another suggestion is providing groups with cue cards, question cards, or question stems. Self-regulated learning must be encouraged as much as possible. Peer-tutoring may be an option even if it is to just prompt one another’s thinking.

Gillies and Boyle (2005) explored the relationship between cooperative learning and scaffolding. Their study found the types of scaffolding interactions used by teachers in cooperative learning included probing and clarifying to extend students’ thinking, acknowledging and validating students’ understandings, focusing on key issues, challenging discrepancies in students’ thinking, and cautiously offering suggestions. They also found that teachers spend less time disciplining when the framework of the lesson was organized as small group discussions rather than a whole-classroom discourse.

Interactions among the whole community of learners are more practical for the reality of the classroom. Hogan and Pressley (1997) referred to Vygotsky’s approach that an individual’s thinking is “profoundly influenced by participating in forms of social practice” (p. 88). The teacher sets the stage for didactic dialogue by organizing a learning environment that focuses on thinking together with students. Scaffolding student participation results in a community of scientific discourse. In this interactive setting, students can articulate their own understandings and other students may benefit from this.
The social environment of the classroom becomes the setting for the scaffolding of values while it supports and fosters the development of student competency. The dialogue for individual students does not only give new insights to subject matter, but also provides ways of thinking strategically and reflectively.

In order to identify discourse and multimodal scaffolding strategies, Sharpe (2006) collected data from a Year 7 history class (first year in high school) in a secondary boys’ high school in Sydney, Australia. Data included detailed observations from video transcriptions, field notes, and linguistic analyses from nine lessons. Using the Systemic Functional Linguistic theory (SFL), the study identified the following discourse strategies that constitute a scaffolded environment: repeating, recasting, and appropriating language to develop technical vocabulary and recontextualise the content; increasing the difficulty of questions to extend or reformulate students’ reasoning; cued elicitation to encourage joint construction and “track students” understanding; use of analogy to draw on students’ existing knowledge; and “metacomments” to summarize key concepts.

Sharpe (2006) also differentiated between “designed-in” scaffolding defined as the overall design of the lesson and “contingent scaffolding” that is delivered at the point of need. Objectives, prior knowledge, procedures, and outcomes are included in both. Contingent scaffolding requires on the spot reaction to opportunities for dialogue, questioning, and interactions among students and teacher and/or other students. Sharpe concluded that a combination of the two, along with both dialogue and visual cues, provide a strong learning environment.
Wells (1995) also describes scaffolding on two levels. The macro level includes the instructional design of the lesson. During the instructional design process the assessment, objectives, development of a sequence of tasks (which includes scaffolding strategies), and evaluation for the lesson is determined. The micro level addresses the spontaneous interaction in the lesson that occurs among the participants of the lesson. These interactions may include questioning, recasting, or adding further clarification. Students can also scaffold one another at the micro level by using the above techniques. Wolfe’s terms correlate with Sharpe’s (2006) definitions of designed-in (macro) scaffolding and contingent (micro) scaffolding.

The following multimodal strategies that comprise scaffolding as identified by Sharpe (2006) are: visual (maps, diagram, and pictures); gestural cues; and actional cues. Discourse strategies include: repeating, recasting, questioning, cued elicitation, analogies, and summaries.

Eisenberg and Berkowitz’s Big6™ Skills Model was considered a metacognitive scaffold in a study conducted by Wolf and Brush (2000). The Big6™ model is intended to scaffold the achievement of research, problem-solving, and metacognitive skills by providing a framework for information literacy. The Big6™ Skills Information Problem-Solving Approach to Library and Information Skills Instruction has been widely adopted in many schools’ curriculum. Equal importance is put on each step (Byerly & Brodie, 1999, p. 60). The Big6™ Skills are:

1. Task Definition
2. Information Seeking Skills
3. Location and Access

4. Use of Information

5. Synthesis

6. Evaluation

In Wolf and Brush’s (2000) quasi-experimental design, 35 eighth grade students were in a scaffolded or non-scaffolded group. The scaffolded group conducted research and wrote their findings with The Big6™ Skills Model as a scaffold. The non-scaffolded group relied on the teacher for direction in a traditional setting. The scaffolded group performed significantly better on the achievement measure, but the teacher-managed group reported more positive attitudes. Authors concluded that providing a scaffold for research skills can be effective when certain conditions are met. These conditions include strong team-based planning and implementation activities, student engagement, and a collaborative learning environment.

A qualitative study conducted by Walton & Archer (2004) looked at scaffolding to achieve information literacy focusing on web evaluation. This three-year case study examined a web literacy course at the University of Cape Town. This course combined exploration and scaffolding in order to facilitate critical and evaluative use of the web. Evaluation of critical use of the web used a framework structured around the questions, Who, What, Why, When, Where, and For Whom. The study concluded that without a well-developed framework, students relied on sites recommended by peers and found it difficult to find quality websites independently.
The aforementioned studies describe in great detail the scaffolding methods that are most successful in classroom settings. Because the current study takes place in the classroom setting, instructional plans that include these details were located. Plans for both instructor delivered (an Ohio Department of Education lesson plan) and web delivered lessons (a short-term WebQuest) included the following components: (a) social interactions that included cooperative learning, peer tutoring, and dialogue and (b) visual cues that included charts and rubrics. These components that were included in this study will be discussed in detail in chapter 3. The next section will show how software and web delivered lessons can implement scaffolding strategies.

Software and Web-Based Scaffolding

Zydney (2005) stated that cognitive processing scaffolds are thought to be the most significant for learners solving a complex problem because they facilitate organizing and synthesizing information about the problem. Zydney’s study had high school students use cognitive processing tools. Their task was to solve a pollution problem in a software program. Intact classes were assigned to one of four conditions: (a) the basic cognitive processing scaffold tools such as a notepad and reference books to aid learners in retrieving prior knowledge and finding new information; (b) the basic tools plus a research template that functioned as an organizational scaffold; (c) the basic tools plus a status report that functioned as a higher-order thinking scaffold; and (d) a combination of b and c. Findings showed that the organizational scaffold increased learners’ problem understanding. The combined condition was not as effective as the organizational scaffold. Zydney stated, “Individual scaffolds may interact with one
another and modify the overall effect of the combined scaffolding” (p. 15). In other words, using two variables affected the reliability of the study. The current study controlled for interaction effect by limiting the variable to one.

Brinkerhoff and Glazewski (2001) studied hypermedia problem based learning. Their research questions were: (a) Was hypermedia problem based learning (PBL) an effective instructional strategy for 6th grade students? (b) What are teacher and student attitudes toward the PBL instructional unit? and (c) How are student and teacher scaffolds utilized during implementation of the PBL unit? The teacher scaffolds were included in a manual to guide instructors on strategies to use. Scaffolds used for students included conceptual (guides students in what to consider) and strategic (guides students as to how to think as they complete the task) types. The hypermedia scaffold was a software program called *Up, Up, & Away!* This program provided help for students in solving problems by offering students conceptual and strategic scaffolds to analyze and solve the problems. Observation revealed student inattention and confusion and non-use of the student hypermedia scaffolds. The teacher did not support use of the scaffolds because he spent much time trouble-shooting technical problems and was therefore disengaged from students. Students were largely unsuccessful in attaining unit goals. This study demonstrates that although there was designed-in scaffolding (macro), scaffolding was not supplied at the micro level; therefore students did not achieve objectives.

Toth (2004) concentrated on the use of representational (visuals) scaffolding in the classroom environment. She differentiated external representations (scaffolds such as tables, graphs, and diagrams for the clarification of ideas while designing experiments,
analyzing data, and formulating theories) from internal representations (products of one’s own thinking). The 2 X 2 factorial design included four groups that totaled 73 9th graders where the effects of two different external representations (evidence mapping vs. prose writing) were studied. Two of the groups were given a method to help them explicitly reflect on the process of their inquiry by using a paper-based handout of specific inquiry criteria to use as a reflection guide. The other two groups did not receive reflection training. Subjects were assigned to one of four conditions: mapping and reflection, mapping and no reflection, prose and reflection, and prose and no reflection. In the study, students were presented with scientific challenges that have no clear solutions, such as mass extinctions. Using web-based information resources, students were to suggest a solution to the given problem. Mapping was achieved using a software tool that aided students in finding relationships between hypotheses and data thereby helping students create evidence maps.

Results indicated that evidence mapping was a successful instructional methodology for categorizing and labeling scientific information and evaluating hypothesis based on empirical data. The findings also indicated that reflective assessment, using an explicit criteria guide, was an effective strategy to support the scaffolding effect of external representations.

To test the effectiveness of a concept-mapping software program, Chang, Sung, and Chen (2001) randomly assigned three classes of seventh-grade biology students to one of three groups: (a) construct-by-self using the software program without a scaffolding aid; (b) construct-by-scaffold using the software that includes an incomplete
framework of an expert concept map as a scaffold in which some nodes and links are blank; or (c) “paper and pencil” concept map where the student creates a concept map using only paper and pencil. The researchers hoped to find out if the different versions of the concept mapping system had different effects on biology learning. Pretest scores were used as a covariate to control potential differences in the students’ prior biology knowledge. Although concept-mapping software was helpful to students in completing their concept maps, the most effective concept mapping, as determined by the posttest biology score, was the construct-by-scaffold condition, which provided a framework for students for each step.

Hypermedia played a major role in (Azevedo, Cromley, Thomas, Seibert, & Tron, 2003) determining effectiveness of different scaffolding methods in facilitating students’ shift to more sophisticated mental models. Undergraduate students were randomly assigned to one of three scaffolding conditions: adaptive process scaffolding (APS), adaptive content and process scaffolding (ACPS) in which the tutors also concentrated on content, and no scaffolding (NS). A pretest was given on the circulatory system. Subjects then utilized the encyclopedia portion of Microsoft Encarta’s Reference Suite focusing on three articles relevant to the circulatory system. The APS and ACPS groups had tutors available. Tutors for the APS fostered each subject’s self-regulation by assisting with the different phases (planning, monitoring, controlling, and reflecting) and areas of self-regulation (cognition, motivation, self, and context). The APS and ACPS groups received the same amount of time with tutors. The NS group did not have tutors. After the 45-minute session was completed, a posttest on the circulatory system was given. Findings
revealed that the ACPS and APS conditions were equally effective and facilitated student learning significantly more than the NS condition.

The previous studies examined combining scaffolding with software, but did not investigate whether student achievement was significantly better if the lesson was delivered by an instructor or in a computer environment. Can the instructional design be applicable to either a classroom or computer environment? McKenzie (2000) provided a guide to instructional designers that includes eight characteristics of scaffolding to incorporate in a project-based instructional plan that is appropriate both in an electronic context and classroom environment:

1. Scaffolding provides clear directions. Instructional designers try to anticipate any student confusion so step-by-step directions are provided for a successful conclusion to the learning activity.

2. Scaffolding clarifies purpose. “Why are we doing this?” is an important student question that needs to be defined before students begin their research project. Rather than simply “collecting” information, the student focuses on the objective and sorts and categorizes the information according to the purpose.

3. Scaffolding keeps students on task. A scaffolded lesson is compared to the “guard rail of a mountain highway.” Students are asked to move along a path, but the steps are defined. Therefore, the student stays on track.

4. Scaffolding offers assessment to clarify expectations. In other words, rubrics and standards of performance are defined from the beginning and examples of quality work are provided.
5. Scaffolding points students to worthy sources and thus reduces wasted time. Rather than having students wander aimlessly through the Internet, best sources are identified so students focus on the assigned task.

6. Scaffolding reduces uncertainty, surprise, and disappointment. Instructional designers are expected to test the lesson before implementation. This eliminates problems that may arise such as lack of clarification.

7. Scaffolding delivers efficiency by eliminating boredom and non-relevant materials.

8. Scaffolding creates momentum by channeling energy.

This study uses McKenzie’s characteristics of scaffolding for the following reasons: (a) the scaffolding examples provided are fitting for student research projects, (b) the scaffolding techniques have been proven effective in an electronic context, (c) these techniques can also be used in non-electronic environments, and (d) the importance of the lesson design is stressed.

One electronic environment that includes McKenzie’s eight scaffolding characteristics is a well-designed WebQuest. The following section further defines a WebQuest and describes scaffolding tools utilized by it if designed properly.

WebQuests as a Scaffolded Learning Device

A WebQuest (Dodge & March, 1997) is a scaffolded learning structure that uses links to essential resources on the World Wide Web and an authentic task to motivate students’ investigation of a central, open-ended question. WebQuests also encourage the development of individual expertise and participation in a group process that attempts to
transform newly acquired information into a more sophisticated understanding. The best WebQuests inspire students to see richer thematic relationships, inspire students to facilitate real world learning, and encourage students to reflect on their own metacognitive processes. Theories and practices that support the WebQuest approach are listed by Lamb and Tcelehaimanot (2005). These theories and practices are learner-centered approaches to teaching: constructivist philosophy, thinking, understanding and transformational learning, authenticity and situated learning environments, inquiry-based learning, scaffolding, differentiation, cooperative learning, motivation, and challenging and engaging learning.

The underlying constructs of WebQuests are: critical thinking, knowledge application, social skills, and scaffolded learning (Dodge, 1995, 2001; Vidoni & Maddux, 2002). Scaffolding in WebQuests as an important construct aids students’ achievement through a structured process (Zheng, Stucky, McAlack, Menchana, & Stoddart, 2006). WebQuest studies demonstrate that scaffolding has positive effects on student accomplishment (Scardamalia & Bereiter, 1984; Cho & Jonassen, 2002; Lim, 2004).

Dodge and March (1995) identified three types of scaffolding utilized by WebQuests; reception scaffolds, transformation scaffolds, and production scaffolds. Reception scaffolds are aids to assist learners in gathering information from the sources that are put before them. “They are designed to direct the learner’s attention to what is important and to help them organize and record what they perceive” (¶ 3). Examples of reception scaffolds are: observation and listening guides, interviewing guides, glossaries, timelines, and note taking guides.
Transformation scaffolds assist learners in transforming information to another form. Learners perceive structure in the information with the aid of reception scaffolds and impose structure on the information with transformation scaffolds. Examples of transformation scaffolds are: Venn diagrams, features charts, organizational charts, and spreadsheets.

The production scaffolds help learners create a product that illustrates what they have learned. Examples of production scaffolds are: presentation templates, writing templates, and multimedia templates.

The reception, transformation, and production scaffolds are classifications that Dodge and March (1995) created; however, previous literature addresses these same scaffolds without the classification. Ge and Land (2004) and King (1997) discussed question prompts (reception scaffold); Hogan and Pressley (1997) mentioned cue cards (reception scaffold); Sharpe identified maps, diagram, and pictures as scaffolding strategies (transformation scaffolds); and Wolf and Brush used the Big6™ Skills as their metacognitive scaffold (production scaffold). An example of a WebQuest is provided in Appendix E.

As mentioned earlier, one type of electronic environment that includes McKenzie’s (2000) eight scaffolding characteristics is a well-designed WebQuest. The design of a WebQuest includes the following elements: an introduction (McKenzie scaffolding characteristic 2: purpose), a task (McKenzie scaffolding characteristic 3: task), resources (McKenzie scaffolding characteristic 5: resources), a process (McKenzie scaffolding characteristic 1: clear directions), an evaluation (McKenzie scaffolding
characteristic 4: assessment), and a conclusion (McKenzie scaffolding characteristic 8: momentum). Students are presented a problem (introduction) and assigned a task. The problem tends to fall into one of multiple categories as defined by Yoder (1998). The problem setting may be a contemporary world problem, evaluating history, creating a product, encountering a reality of life, or an attempt to trigger the student’s imagination. The students then begin the process with the teacher as a guide.

WebQuests are designed to use learners’ time well (McKenzie scaffolding characteristic 7: efficiency), to focus on using information rather than looking for it (McKenzie scaffolding characteristic 5: resources), and to support learners’ thinking at the levels of analysis, synthesis, and evaluation (Dodge & March, 1997).

As mentioned in McKenzie’s (2000) fifth characteristic of scaffolding, scaffolding points students to worthy sources and reduces wasted time. This is one of the strengths of a WebQuest. The teacher gathers appropriate and relevant websites thus narrowing and directing students’ web searches (Vidoni & Maddux, 2002). This increases the likelihood that the task will be completed and decreases the likelihood that the students will wander aimlessly through an overwhelming surplus of information.

McKenzie’s (2000) sixth characteristic of scaffolding recommends instructional designers test the lesson before implementation. This recommendation is aligned with Dodge’s (2007) suggestion that when creating a WebQuest check it yourself and then have someone else evaluate it.

The taxonomy of WebQuests lists 12 types of tasks: retelling, compilation, mystery, journalistic, design, creative product, consensus building, persuasion, self-
knowledge, judgment, analytical, and scientific (Dodge & March, 1997). WebQuests may be short term or long term. Dodge and March’s definitions of the two are:

The instructional goal of a short term WebQuest is knowledge acquisition and integration, described as Dimension 2 in Marzano’s (1992) Dimensions of Thinking model. At the end of a short term WebQuest, a learner will have grappled with a significant amount of new information and made sense of it. A short term WebQuest is designed to be completed in one to three class periods.

The instructional goal of a longer term WebQuest is what Marzano calls Dimension 3: extending and refining knowledge. After completing a longer term WebQuest, a learner would have analyzed a body of knowledge deeply, transformed it in some way, and demonstrated an understanding of the material by creating something that others can respond to, on-line or off-. A longer term WebQuest will typically take between one week and a month in a classroom setting. (¶ 3)

Most WebQuest assignments require a final product (McKenzie characteristic 4: assessment). Yoder (1998) provided resources for rubrics that include an array of criteria and benchmarks for each accomplishment. The WebQuest conclusion gives the students an opportunity to offer feedback, share their discoveries, and reflect on what they have learned.

This author did not find any quantitative studies involving use of WebQuests in the classroom versus traditional methods, but some action research was available. *Global Warming: A Heated Debate* (Dutt-Doner, Wilmer, Stevens, & Hartmann, 2000) is a
WebQuest developed to target science and technology standards in Maine. Global warming had been researched before in a traditional approach but teachers discovered students relied on outdated or incorrect information. Staff felt active learning based on a constructivist model would engage students in their own learning. Observation indicated that students learned more about global warming implementing the WebQuest approach than a traditional classroom approach.

WebQuests can be a tool for differentiation in three areas: content, process, and product (Schweizer & Kossow, 2007). WebQuests level the playing field by encouraging learners from different levels and areas of intelligence, different backgrounds, and different learning preferences to achieve the assigned tasks. Gifted children can take their project to intellectual and creative depth that typical assignments and projects may not allow for.

Not only can WebQuests be advantageous for the gifted student (Kelly, 2000), but for the learning disabled student as well (Skylar, Higgins, & Boone, 2007). Learning disabled students, as other students, may be more motivated by using technology rather than the traditional textbook. Links to stimulating graphics and animation plus the high structured framework of a WebQuest may benefit the learning disabled student. The preceding studies are important to the current one because of the characteristics of the subjects that participated in this study. Learning disabled and gifted students were both included in this study along with other students so it was important that the web delivered lesson was beneficial to all groups.
Attempting a more empirical study, Abraham (1998) created a partially Internet-based course for university business students. The intent was to give students more flexibility in their schedules by accessing online components at student convenience and provide a more active learning environment. Teams of two to three students were formed to create a WebQuest on a topic of their choice and then present the WebQuest to the class. A control group was not used, but students in this class scored higher than past classes on the same content test. Student feedback was very positive concerning participation in the WebQuest project.

Perkins and McKnight (2005) surveyed 139 educators on their attitudes toward WebQuests as a method of teaching. Conclusions revealed that those teachers who had created and utilized Web pages with students were more likely to do the same with WebQuests. Novices showed concern and focused on trying to learn WebQuests and how it would affect them personally. A survey of open-ended question resulted in the following feedback: teachers liked the interactivity on WebQuests which kept students focused and motivated; teachers observed that students used the links to useful information and time was used efficiently; students can set their own pace for WebQuest activities; and the uses of technology was beneficial to students.

Now we know WebQuests are beneficial, but where does one start to design it? WebQuests can be difficult for teachers to create and a server that can host is a necessity. Dodge provides software that allows teachers to create and host on his site (Barack, 2005a), but creating a WebQuest can be an overwhelming undertaking. However, resources to aid teachers in putting together a WebQuest are abundant. Using the key
word “WebQuest” in an Internet search engine will result in thousands of hits. Teachers may not even have to create a WebQuest for a specific topic; it may already be available. However, just as there are big differences in the quality of websites, the quality of WebQuests also varies widely. Some WebQuests may have been created without careful planning or without trying to meet curricular needs. Other WebQuests may have been carefully crafted to optimize the learner’s experience. Dodge (2001) identified five rules for writing a WebQuest using the acronym “FOCUS.” Find great sites, Orchestrate your learners and resources, Challenge your learners to think, Use the medium, and Scaffold high expectations. A quality WebQuest design includes McKenzie’s (2000) eight scaffolding characteristics in sync with Dodge and March’s essential WebQuest elements. A PowerPoint is available online (Schrock, 2004) that provides a history of WebQuests and critical elements in creating one.

Zheng et al. (2006) addressed the discrepancies among WebQuests claiming some are merely electronic worksheets of URL addresses. In their study of student perception of WebQuests, they found three constructs were critical for positive student perception: constructivist problem-solving, social interaction, and scaffolded learning. These constructs need to be considered by those who design WebQuest for optimum learning. The short term WebQuest that was used in the current study followed the eight characteristics of scaffolding as defined by McKenzie (2000). Just as quality WebQuests need to be evaluated, so do websites that are available to students. The next section addresses the importance of website evaluation, a key component of information literacy.
Evaluation of Websites

Baule’s (1997) statement “Since it is on the Internet, it must be true” is one with which many high school students wholeheartedly agree. With the growth of the Internet, information and misinformation is within the touch of anyone with a computer and Internet connection. In the Ohio Department of Education Academic Content Standards: K-12 Guidelines for Library, information literacy is defined as the ability to locate, process, evaluate, and utilize information.

The Pew Internet & American Life Project researched how the Internet is used by students (Lenhart, Simon, & Graziano, 2001). The study found that for many teens, the Internet has replaced the library as the primary tool for doing research and 97% of teens reported using the Internet to do research for school. A 15-year old interviewed stated:

Without the Internet you need to go to the library and walk around looking for books. In today’s world you can just go home and get into the Internet and type in your search term. The results are endless. There is so much information that you have to ignore a lot of it. (p. 4)

Other previous research included a survey (Geffert & Christensen, 1998) that questioned 521 incoming college freshmen about their attitudes, opinions, and knowledge of the research process. Findings indicated that (a) students believed their research abilities were better than actual performance, (b) this overconfidence affected students’ motivation to listen to bibliographic instruction, and (c) the number of high school library media specialists’ lectures on research strategies did not seem to make a difference to student achievement.
These findings are important because they indicate that web evaluation skills are vital to every student research project. Vygotsky (1978) stated that acquiring certain skills is “characterized by complicated qualitative transformations of one form of behavior into another, or as Hegel would phrase it, a transformation of quantity into quality” (p. 19). Therefore, even though one is accessing the Internet on a daily basis and may feel confident about his or her skills, this may not lead to knowing how to choose quality websites.

A national report issued by the Partnership for 21st Century Skills (Partnership, 2004) listed six skills that high school students need in order to succeed in the real world. Two that are pertinent to the library curriculum are learning and thinking skills (includes critical thinking, problem solving, communication, collaboration, creativity, and information and media literacy skills) and information and communication technologies (ICT) literacy (the ability to use technology to learn content and skills). Kathy Schrock (2004) wrote, “By training, and modeling for, our students how to become critical evaluators of information that we find, we shall be producing the well-educated ‘information consumers’ of tomorrow” (¶ 4).

In his role as a teacher, Rothenberg (1998) was concerned that students’ use of the Internet was resulting in a decline in both the quality of writing and originality of thought expressed.

The placelessness of the Web leads to an ethereal randomness of thought. Gone are the pathways of logic and passion, the sense of the progress of an argument.
Chance holds sway, and it more often misses than hits. Judgment must be taught, as well as the methods of exploration. (p. 60)

In a study by Fogg (2002), results demonstrated that 2,600 adults surveyed did not use rigorous criteria when assessing a website. Data showed that the average adult was more concerned about the superficial aspects of a website such as design look (46.1%) and information structure (28.5%) than accuracy (14.3%) and bias (11.6%).

It is of vital importance that we teach web evaluation. Whereas the information explosion affords opportunities not available in the past, without efficient instruction in information literacy, information found on the Internet may do more harm than good. An action research study (Scott & O’Sullivan, 2000) was designed to examine high school students’ use of the Internet, their evaluation of it as a learning tool, and their personal satisfaction of using the Internet for educational research. Results concluded that providing tools for students to evaluate websites leads to a greater awareness and understanding of the “unrestrained excesses” of the Internet. This conclusion can aid “the school library media specialist to teach students how to access, use and evaluate information resources efficiently and ethically based on academic or personal need” (Ohio Department of Education Academic Content Standards: K-12 Guidelines Library, 2004, p. 26) to achieve information literacy.

A Florida study (Thomas, 2001) of four high schools revealed that teachers were often unfamiliar with online resources and did little to teach information literacy skills prior to a class research project. In an Australian study (Henri, 2001), the progress of 91 teachers attending graduate school was tracked through a major research project. The
results indicated that teachers demonstrated the same deficit of information literacy skills that high school students lacked. The study challenged the assumption that teachers can appropriately model good information literacy skills. Fidel et al. (1999) similarly concluded that “to be effective in school systems, students and teachers, as well as librarians, require training” on Internet searching (p. 36).

Web evaluation criteria guidelines abound. Authors appear to be in agreement about what characteristics should be included in a valid website. Authority, accuracy, objectivity, currency, and coverage are components of website evaluation listed by Gardner, Benham, and Newell (1999); authority, purpose, accuracy, timeliness, integrity of information, and viewpoint were listed by Hammett (1999); and Scott and O’Sullivan (2000) cited accuracy, authority, objectivity, currency, and coverage. Chen and Brown (2000) investigated what teachers should look for when evaluating websites for student use. Authenticity, applicability, authorship, bias, and usability were their choices. Although some of the terms may differ, the meaning is analogous. The criteria used for web evaluation in this study can be found in Appendix A.

**Evaluating Health Websites**

The *Handbook of Research on Improving Student Achievement* (2000) stated, “Instruction that increases students’ ability to analyze and critically examine the health messages promoted in the media and culture helps them make informed health choices” (II: 5.5). Fox and Fallows (2003) reported that 80% of adult Internet users, or about 93 million Americans, have searched for a health topic online. This statistic makes the act of looking for health or medical information one of the most frequently performed activities
online. It is topped by only two other activities: email (93%) and researching a product or service before buying it (83%). The current study focused on evaluating health web sites because the subjects that participated were from health classes that were assigned health research topics.

The World Wide Web can be a valuable tool for those in search of health information. It is essential that the information is authentic as it could possibly affect health outcomes for many. Health professionals recognize that it is both challenging and crucial to have appropriate evaluation tools for checking the validity and authority of websites. Many empirical studies have tried to produce a valid instrument for evaluating the authenticity of health Internet sites. The hope was to provide consumers with a health site rating. One attempt (Bomba, 2005) to develop a validation method and rating instrument used the Delphi method to produce a tool to evaluate websites targeting health consumers. However, there were limitations on this study: only three health experts were used in the Delphi method and the selection criteria for defining an expert lacked rigor. Bomba is currently working on these limitations to refine the health site rating tool.

Wilson (2002) focused on tools that have been developed to assist site developers to produce quality sites and for consumers to assess their quality. These tools are classified into five categories: codes of conduct (sets of quality criteria that provide suggestions for the development and content of websites), quality labels (logo that is displayed on the screen signaling to the user the provider adhered to a code of conduct), user guides (allows users to access questions to check if a site adheres to standards), filters (would accept or reject whole sites based on preset criteria), and third party
certification (an accreditation awarded by a third party). Wilson echoed Bomba (2005) in saying, “Quality remains an inherently subjective assessment, which depends on the type of information needed, the type of information searched for, and the particular qualities and prejudices of the consumer” (p. 600). Wilson concluded that it may be easier to educate the consumer and with time he or she will be able to evaluate the Internet critically.

Risk (2002) agreed with Wilson (2002) that quality is a personal preference and the reputation of the site may matter more than any other factor. Risk cited another study (Hernandez et al., 2001) that found a positive correlation between the number of inbound links to a health website and the probability that the site conforms to the quality criteria of the Health on the Net Code (HONcode). The HONcode defines a set of rules to hold Website developers to basic ethical standards in the presentation of information to advise readers of the source and the purpose of the data they are reading. Risk commented that the preceding correlation supports his preference to use Google as a search engine because Google ranks websites to a degree by the number of inbound links to a given site.

A quantitative study by Sutherland, Wildemuth, Campbell, and Haines (2005) determined the content quality, general readability, and usability characteristics of consumer nutrition information of the Internet. Five hundred websites were accessed via either a popular search engine (Google, Lycos, and Alta Vista) or the U.S. Department of Health and Human Services Web portal (www.healthfinder.gov). Each site was rated on a 27-item rubric. The popular search engine results scored significantly lower for content
quality ($p < .0001$), but were easier to navigate ($p < .0001$), had better overall adherence to usability standards ($p < .0001$), and had lower reading levels compared with the government Web portal. These findings contradict Risk’s (2002) comment that Googling is a reliable way to search for health information.

Hobson (2003) stated if you hunt for “breast cancer” on Google, you are presented with more than 4.3 million pages through which to sift. When narrowing the search to “breast cancer” and “associations,” choices are reduced to 166,000. Suggestions to improve searches included using the federal government’s portal (www.healthfinder.gov) or NOAH (www.noahhealth.org), a New York based group of health and science libraries and “following the money.” Following the money means to find out who owns the site and the site’s purpose. “We’re so suspicious of commercial influence, but some of the most accurate, reliable information on the Web is on pharmaceutical Websites,” says Donnica Moore, a physician and consultant who directs DrDonnica.com, a site that focuses on women’s health (Hobson, 2003, p. 49). It is more efficient to learn how to narrow a topic before learning how to evaluate a website. The author also stated that bias, intended audience, currency, and the site’s resources are also very important criteria for a website’s value. Todd (2003) addressed the importance of website evaluation:

If you overlook this critical stage of information-literacy instruction, students will fail to gain ownership of their research and never learn the correct way to evaluate or locate quality information. An evidence-based approach provides a rich
opportunity for school library media specialists to ensure that their lessons make a real contribution to student learning. (p. 53)

Todd’s (2003) studies indicate web evaluation and other information literacy lessons are vital to today’s students. These conclusions were an impetus to the current study.

Reason and Torbert (2001) state that first-person research methods facilitate the researcher to use an inquiring approach to his or her own practice, to attentively choose their actions, and then assess the effects. First-person research brings inquiry into every moment of action—not as outside researchers but in the whole realm of his/her practice.

Using the above in an educational context, Stenhouse (1981) believes teachers need to play a more pivotal role in educational research.

Two points seem to me clear: first teachers must inevitably be intimately involved in the research process; and second, researchers must justify themselves to practitioners, not practitioners to researchers. (p. 144)

The Madison Metropolitan School District (MMSD) supports the above beliefs as evidenced by the 1990 implementation of a classroom action research professional development program. Rather than have teachers as passive recipients of “expert” knowledge from consultants, MMSD believes in the capabilities of their own teachers in playing active roles in deciding what is the most effective way to instruct students. Teachers develop clearly articulated questions focusing on their own practice that can be answered within the classroom context. The MMDS’s Classroom Action Research Program is a model of the research teachers can do within their classrooms to create a
positive change in the educational environment. The following assumptions guide the program: (a) teachers are competent, capable individuals, (b) teachers are a reliable source of information and have much to add to the research base in education, (c) stakeholders can effect change, (d) while district initiatives are significant in the Classroom Action Research Program, teachers are respected for their work and opinions (Caro-Bruce, C., Flessner, M., & Zeichner, K.). This study is an attempt by a teacher to determine the most effective and efficient way to teach her students website evaluation.

Summary

Previous studies indicate that without prior or effective instruction in information literacy, successful use of the Internet may not occur (Henry, 2004; Scott & O’Sullivan, 2000; Small & Arnone, 1999). These studies specify that without proper instruction students randomly search the World Wide Web and utilize resources that may not be authoritative, accurate, unbiased, and current. The current study’s pretest also indicates the same tendencies. As mentioned previously, the goal of the current study is to find an effective and efficient strategy to instruct students on web evaluation.

So what strategy is the most effective and efficient way to teach students web evaluation? Cited studies have shown that scaffolding is a very effective instructional method; however, these studies have also shown how time consuming this method is when implemented by an instructor. The school library media specialist has very limited time with students so efficiency of a lesson is essential. Therefore, the researcher used a single scaffolded lesson and delivered it in two ways, via teacher and the Web to measure for both efficiency and effectiveness.
For the purpose of this study, scaffolding definitions contributed by Wood et al. (1976) and Puntambekar et al. (2005) were used. Wood believed the assistance of a tutor would enable the novice to complete a task or solve a problem which would be beyond his unassisted efforts. Puntambekar considered his definition in the context of a classroom setting. Communication between teacher and learner enable the teacher to continually assess the learner’s comprehension and provide support. When the learner is ready, the support is eventually removed so the learner completes the task on his own. Chapter 3 will detail the scaffolding methods used to aid the learner in a task he may not be able to complete on his own.

This present study is a “scaffolding analysis” as defined by Sherin, Reiser, and Edelson (2004). A scaffolding analysis is a comparative analysis that is performed on two learning interactions, a scaffolded situation and a base situation. The additional features of the scaffolded situation are examined for specified changes in performance. The predetermined scaffolding features used in the current study are peer tutoring, question prompts, and dialogue. The difference in this study from Sherin’s et al. proposed framework is that there are two scaffolding situations and one base situation.

The two scaffolding methods are teacher delivered and Web delivered. Using Wells’ (2002) definition of macro and micro levels of scaffolding; the lessons delivered in the current study were identical at the macro level, but differed at the micro level. Further details on how this occurred will be provided in chapter 3.
Although studies exist on classroom courses versus distance learning or web delivered, there is a need for a study that investigates the same lesson with different delivery methods. This study hopes to answer the following research questions.

Research Question 1

Which scaffolding treatment, teacher scaffolded or web scaffolded, leads to the selection of the best websites?

*Null Hypothesis*

\[ H_0: \mu_1 = \mu_2 = \mu_3 \]  
There is no difference in the treatment group web evaluation means scores in students exposed to different web evaluation instructional strategies.

*Data Analysis*

A one-way ANOVA was run with alpha level set at .05 on data that was collected from the web evaluation rubric scores.

Research Question 2

Which scaffolding method, teacher scaffolded or web scaffolded, produces the greatest retention of web evaluation skills?

*Null Hypothesis*

\[ H_0: \mu_1 = \mu_2 = \mu_3 \]  
There is no difference in the treatment group web evaluation mean scores after a 9-week period.

*Data Analysis*

An ANOVA repeated measures tracked the mean scores of each group’s web evaluation scores over the nine week period.
Research Question 3

Which group scaffolding - teacher scaffolded or web scaffolded - is more efficient?

Null and Alternative Hypothesis

\[ H_0: \mu_1 = \mu_2 = \mu_3 \] There is no relationship in web evaluation scores and instructional time.

Data Analysis

The individual web evaluation mean scores were divided by the amount of instruction time and then an ANOVA was run.
CHAPTER III

METHODS AND PROCEDURES

This study explored the impacts of different scaffolding techniques on the evaluation of websites by 10th-grade students in the context of information literacy instruction delivered in the library media center. This study examined (a) differential effects of teaching strategies on student success in evaluating websites, (b) the retention of the learned skill, and (c) the most efficient teaching strategy in terms of instructor time and student achievement.

Subjects

A convenience sample of 73 students in three 10th-grade health classes in a Midwest suburban high school was used. The majority of the students were from middle class backgrounds, 97% were Caucasian, and 5% received subsidized lunches. Approximately 50% were female and 50% were male. Special education students comprised 11% of the sample. Grade point averages (G.P.A.) at the time of the study ranged from .89 to 4.0. The average G.P.A was 2.989 (See Table 1).

The three intact classes were randomly assigned to one of three learning conditions. These three groups were defined as (a) teacher scaffolded (TS), (b) Web scaffolded (WS), and (c) nonscaffolded (NS). Because of the school schedule, it was necessary to assign intact classes to learning conditions rather than individual students
randomly to one of these groups; however, the entire 10th-grade population was assigned arbitrarily to health classes at the beginning of the school year and there is no prior reason to suppose systematic bias. Data collected during this study supports this conclusion.

All students had been previously instructed in evaluating websites and using correct Modern Language Association (MLA) citations by the school library media specialist. This one day instruction occurred during the prior year in a mandatory semester long study skills class. Students were asked by a show of hands if they were present for this lesson, and all had been so instructed. This library skills class included instruction on evaluating websites, using the InfOhio database, hints on taking notes, citing references using correct Modern Language Association rules, and summarizing a periodical article. The complete lesson plan for all the above is provided in Appendix G.

The web evaluation portion of the ninth grade lesson was not as detailed as the tenth grade lesson delivered to the treatment groups the during the study school year. The ninth grade students were introduced to the FACS model: Finding the page (what search engine and keyword were used?); Author’s credibility and accuracy of information; Currency and well-covered topic; Sense of information (is information biased and the same as read elsewhere?).

In preparation for this project, each subject received parental permission to participate in the study. Subjects completed five health assignments during the nine week grading period that were assigned by the health teacher. These assignments included research on the following topics: (a) mental health; (b) nutrition; (c) first aid; (d) alcohol
and drugs; and (e) smoking. Each assignment included a bibliography with one or more websites used by the students in their research.

The assignments were based on the Inquiry Model (Focus of Inquiry, 2004). The Inquiry Model is a scaffold for instruction providing the content and structure for a lesson. Skills and strategies that need to be taught explicitly in each phase of the process are outlined. The Inquiry Model includes the following components:

Planning:

- Identify a topic area for inquiry
- Identify possible information sources
- Identify audience and presentation format

Retrieving

- Locate and collect resources
- Select relevant information
- Evaluate information

Processing

- Establish a focus for inquiry
- Choose pertinent information
- Record information
- Make connections and inferences
Creating

- Organize information
- Create a product
- Think about the audience
- Revise and edit

Sharing

- Communicate with the audience
- Present new understandings
- Demonstrate appropriate audience behavior

Evaluating

- Evaluate the product
- Transfer learning to new situations/beyond school

Setting

For the purpose of this study, instruction for the health classes was conducted in the school library where there are 36 microcomputers connected to the Internet. The library is a 6,000 square foot facility that has room for up to four simultaneous instructional activities. During the control groups’ assigned time in the library, the library was also being utilized by other students: (a) using their lunch break to work on homework, (b) a class accompanied by the teacher to do a research project, and (c) individual students coming from a class to make up work or take a test. However, the
library was closed during Week 2’s instruction to the treatment groups. This was to control for confounding factors such as noise from these other students.
Table 1

Demographic Statistics of Student Participation

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Teacher Scaffolded</th>
<th>Web Scaffolded</th>
<th>Nonscaffolded</th>
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</thead>
<tbody>
<tr>
<td>Total</td>
<td>25</td>
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<td>20</td>
</tr>
<tr>
<td>Female</td>
<td>15</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>Male</td>
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<td>2.9</td>
<td>2.84</td>
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<td>6</td>
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<td>12</td>
</tr>
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<tr>
<td>Below 1</td>
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<td>0</td>
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</tr>
<tr>
<td>Baseline Scores</td>
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<td>1-2 points on rubric</td>
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<td>2</td>
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</tr>
</tbody>
</table>
Dependent Measures

A rubric was designed by a panel of experts consisting of six high school library media specialists who were members of the Summit Area Media Specialists organization (see Appendix A). The following excerpt from the *Ohio Department of Education: Library Guidelines Grades 9-12* was used as a guideline for development of the rubric:

*Grade Ten:*

Website Evaluation: Examine the information retrieved through Internet searching for authenticity of information, bias, currency, relevance and appropriateness. (p. 97)

The author contacted the Ohio Department of Education (ODE) to clarify how the terms “relevant” and “appropriate” were intended in the standards. According to a member of the ODE committee, (D. Dillon, personal communication, March 7, 2006), “relevant” referred to the student’s individual need and “appropriate” implied appropriate for the student’s reading level and age. The relative ambiguity of these two terms, and the student perspective from which they are evaluated, made them less appropriate for inclusion in the study. Due to these difficulties, “relevant” and “appropriate” were not included on the rubric. The author determined the elimination of these two terms would not have an effect on the outcome of the study because (a) the students were all assigned the same project so an individual “relevancy” is not critical and (b) subjects were all in the same grade so “appropriateness” is negligible.

The remaining components of authenticity, bias, and currency were included in the rubric. The three components were assessed through dichotomous, factual questions
that could only be answered “yes” or “no” thus creating an objective tool (see Appendix A). For example, “Does the author or sponsor provide a source for the material that was included in the website” could be answered yes or no after the website had been examined. If sources were cited, then one point was awarded. If not, then no points were awarded. Eight questions were developed to evaluate student choice of website. The questions were based on literature regarding the best way to evaluate websites (Baule, 1997; Chen & Brown, 2000; Gardner et al., 1999; Green, 2001; Henry, 2004; Jonassen et al., 2003; Schrock, 1999; Spitzer, 2000) and input from the panel of experts. Cronbach's alpha was used to estimate internal consistency of the eight items in the Web Evaluation Rubric. Alpha was .711 which is above the general acceptable requirement of 0.70. The web evaluation rubric’s perfect score was 8 points meaning the website met all the criteria of an authentic website as defined by the above researchers. Analysis of the web evaluation scores for all students’ cited websites answered the research questions that dealt with student evaluation of websites.

The web evaluation rubric was not given to the subjects. It was used only as an instrument for scoring the websites. The students were given the Evaluating Websites Chart (Appendix D) which included the Web Evaluation Rubric’s items (appendix A), because it was more specific for the purpose of instruction, peer tutoring, and cooperative learning.

Interrater reliability was used to address the consistency of the implementation of the Web Evaluation Rubric. The library media specialist scored the websites used by the students. However, members of the panel of experts also scored dozens of the websites to
check for reliability. During weeks 3, 5, 7, and 9, two to three teachers randomly scored cited websites to check for interrater reliability throughout the study. Points given to the websites by the school library media specialist were 100% consistent with points awarded by the panel of experts.

Materials

The WebQuest designed by Joyce Valenza, *A WebQuest about Evaluating Websites* (see Appendix E), was identified by Jonassen (2003) as an exemplary WebQuest. Some of the website’s links were broken so the author updated links so students could access needed information. The updated WebQuest was then posted on the school district’s server.

The Ohio Department of Education provides a website, *Instructional Management System* (IMS), which is the vehicle for communicating State Board adopted model curricula (Ohio Department of Education, 2006). You may search for a lesson plan using a specific content area, grade level, and keyword. There the author found the teacher scaffolded lesson plan (see Appendix B) that was used in the study. It was chosen because (a) it contained this study’s required scaffolding components, (b) it was written for high school students, (c) it could be accomplished in the allotted 90 minute time requirement, and (d) it was almost identical to the Valenza WebQuest that was used.

Thirty-six microcomputers were used by the students as they searched for the websites they evaluated. Library tables and chairs provided a meeting place for students to discuss their findings and a laptop and projector enabled to present their findings to the class.
Procedures

The study was conducted during the 2005/2006 school year. The school uses 90 minute scheduling blocks known as block scheduling. A semester of school is completed in nine weeks. During these nine weeks, health students came to the library five times to complete a research report on the following topics: mental health, nutrition, first aid, alcohol, and smoking. Two health teachers and the school administration were approached about their willingness to participate in the study. After initial agreement with teachers and school administration, a letter of consent, in accordance with Institutional Review Board (IRB) standards, was sent home to 93 sets of legal guardians. Permission was granted for 84 students (90.3%) to participate, 4 denied permission, and 5 did not return the permission slip. The ultimate number of students was reduced for a final sample size of 73 (78.5%) due to missing assignments and/or absences. The study was conducted during six 90-minute class periods (five days to complete the five research projects and one day for the Web evaluation lesson).

Teacher Scaffolded Group Procedure

Teacher Scaffolded: Week 1

The teacher scaffolded group (TS) began Week 1 with a library introduction that included (a) an outline of library rules and procedures, (b) a review of Modern Language Association (MLA) style citation, and (c) an overview of the 9-week health research agenda. A certified library media specialist instructed the teacher scaffolded group. Qualifications for this teacher include National Board Certification in library media, a Masters of Education, and a Masters of Library and Information Science.
After the introduction, students conducted their research for their first health topic; mental health. Their assignment for this project was to find a current article on one of the following topics: fears, phobias, love, anger, guilt, grief, defense mechanism, peer pressure, or any topic dealing with emotions. The students were to locate an article and summarize it in one single-spaced typed page. Modern Language Association (MLA) format for the source was required. MLA style was chosen because the entire school district uses this format for uniformity. At this point, no support was given to choice of website. This assignment was due in two days.

The mental health reports were graded by the health teacher and then given to the library media specialist to score. The websites cited in bibliographies were scored using the Web Evaluation Rubric (see Appendix A) to obtain a baseline score. This baseline score then served as an indicator of student ability to evaluate websites and was used as the pretest in this study.

*Teacher Scaffolded: Week 2*

A summary of the intervention received during Week 2 by the teacher scaffolded group follows. A detailed lesson plan is provided in Appendix B. The lesson plan was provided by the Ohio Department of Education and accessed from their *Instructional Management System* website (http://ims.ode.state.oh.us/ode/ims). This lesson plan was chosen because of its similarity to Joyce Valenza’s WebQuest that would be used for the web scaffolded group. The lesson plan also included scaffolding strategies that the WebQuest employed. Maintaining common elements of the two lesson plans was
important in order to control for confounding variables. Briefly, both groups would be evaluating specific websites and present their results to the class.

The library media specialist lectured on the importance of website evaluation. She then gave an overview of the assignment students would be working on. In a group format, the library media specialist evaluated a website using the same evaluation form the students would use (see Appendix D). The library media specialist used a “think aloud” protocol to model the evaluation process the students were to use. Hints on where to look for the author, whether the author was an authority, and the definitions of bias, timeliness, and content were presented.

Students were given the choice of who they would work with and the specialty roles they would assume. The four specialist roles were: content analysis specialist; credibility specialist; layout and design specialist; and bias specialist. The different roles were explained to students (see Appendix C). It was observed that students most often chose friends as partners. This voluntary grouping likely resulted in homogeneous ability groups. For example, the special education students grouped together and the students with high G.P.A.s grouped together.

The Evaluating Websites Chart (see Appendix D) was given to the students, who then proceeded to the computers to evaluate the websites that had been bookmarked for them. Prior to this session, the library media specialist selected and bookmarked a series of websites that provided examples of different quality levels of websites and included topics that students would be researching. These topics were mental health, smoking, and cloning. There were eight websites for each topic and each group was assigned four
websites in one particular topic series. Each series contained a website that scored an 8 on
the Web Evaluation Rubric. Each series also included a bogus website that had been
discovered using Google search engine and the topic as the keyword. For example, one
mental health website included a home page picturing a man holding a four foot pickle
found by using the keyword “phobia.”

Each group was assigned a different series of websites to evaluate so class
presentations would not be redundant and students would be exposed to multiple
websites. There was some confusion from the students on their roles and the websites
they were to evaluate. Each member of the group was instructed to evaluate all four of
the assigned websites from the perspective of the role assigned. For example, the student
who chose the bias/purpose specialist role would use the following questions as a
guideline in evaluating the four websites:

1. Why was this site created? (to persuade, inform, explain, sell, promote,
   parody, other?)
2. Is it a personal, commercial, government or organization site?
3. Is there any bias? Is only one side of the argument presented? Does it appear
   that any information is purposely omitted? Is there a hidden message? Is it
   trying to persuade you or change your opinion? Is the bias useful to you in
   some way?
4. Can you distinguish facts from opinion?
5. Would you include this site in your bibliography?
As the students worked, the library media specialist moved among groups providing feedback. Many of the students seemed initially confused as to the purpose of the rubric. They thought they were expected to answer each question (see Appendix D) provided rather than use the questions as a guide for evaluation. During the evaluation process, there was some laughter and bewilderment when students checked one of the “bogus” websites that had been included for evaluation. Students were puzzled and asked the library media specialist to help them in evaluating the website. In the case of the four foot pickle, she explained the website had been found by using Google as a search engine and “phobia” as the key term thus highlighting the need for careful evaluation of websites retrieved by search engines.

As the students finished their evaluation of the websites, they proceeded to the library tables to meet with their groups. The library media specialist gave guidelines for student collaboration in their groups. Students were to work together in their groups to reach consensus on their rankings. Each member presented his/her evaluation on the four websites from the perspective of his/her specialty role. Peer tutoring was observed as students instructed their group on their specialist roles. A consensus was to be reached and then recorded on the *Evaluating Websites Chart* (see Attachment D) ranking the websites from 1 to 4. During student collaboration, the library media specialist provided additional clarification on ranking websites. Feedback was provided to each group and the selection of the spokesperson was confirmed. For example, a group that examined the mental health websites chose one that was a top-ranked website. The instructor pointed
out specifically the criteria that websites meet and commented the group did an excellent
job of evaluating the website.

The group spokesperson then presented the top-ranked website selected by the
group. Using the *Web Evaluation Chart* (attachment D) as a guide, the spokesperson
discussed the group’s perceptions of the strengths and weaknesses of the chosen website.
During this activity, students were observed to be listening to each group. All groups but
one correctly chose the best website.

After each group finished, the library media specialist completed the student
assessment form to assign a score for each group’s effort (see Appendix F). The
maximum score was 20 points which was included in the student’s health grade. The
mean score for this activity was 18 points.

*Teacher Scaffolded: Week 3*

During Week 3, the teacher scaffolded group (TS) researched a topic relevant to
nutrition. A current article or Internet site could be used and a summary was to be typed.
This summary was to be written in a one page single-spaced paper format. Each student
was required to include a bibliography with at least one reference using the Modern
Language Association (MLA) format. This nutrition assignment was an individual
project and students did not work together. The nutrition subtopic was chosen by the
student with final approval given by the health teacher. Some of the topics were fad diets,
childhood obesity, and adolescent nutrition. The library media specialist provided
nutrition books and pamphlets that could be used by the students, but students used
search engines to locate relevant websites on their topics. The library media specialist
briefly reviewed the website evaluation exercise performed the previous week and students were asked to employ those skills during this nutrition research activity.

The remainder of the week continued with students completing their reports. The health teacher graded the nutrition reports and then gave the reports to the library media specialist. Using the Web Evaluation Rubric (see Appendix A), websites provided in the bibliographies were scored. If more than one website was cited, the website that scored the highest points was recorded. The reason for this was the low occurrence of more than one site cited (one or two per class) and averaging two websites score would compromise the findings. Feedback was provided on the bibliography page concerning website choice. For example, if a student cited a website that did not include an authoritative source, a comment was written next to the MLA citation. The rubric score and feedback were not included in the student’s report grade.

Teacher Scaffolded: Week 4

The health teacher provided first aid instruction in the health classroom. Objectives for this week were the students would be able to: identify and treat wounds, burns, and bone injuries; recognize potentially hazardous situations; and perform life-saving techniques. The teacher scaffolded group did not visit the school library media center during this week.

Teacher Scaffolded: Week 5

Students came to the library to research an assigned first aid topic. The topics addressed emergency situation responses to choking, burns, broken bones, sprains, etc. Students worked in dyads. Requirements included a three page single-spaced typed report
with a bibliography in the Modern Language Association (MLA) format. In addition to completing a report, an oral presentation with a visual aid was required. Once again, printed materials were available, but students relied heavily on the Internet. Some students made use of charts that were provided in the vertical file for their visual aid. Observations made during this activity suggest conversation between partners at the computers addressed website quality or a visual they could easily replicate. Two days of library time were allotted; the first day was used for research and the second day for the creation of the visual aid and presentation. Some students worked on PowerPoint presentations, others created pamphlets or posters. The library media specialist was consulted for technological advice and materials for visual aids. First aid projects were completed by the end of Week 5.

*Teacher Scaffolded: Week 6*

Students presented their first aid projects in class. The health teacher graded the written reports and presentations. Components graded in the written report included: scope of the topic; inclusion of major points; correct spelling, punctuation, grammar; and correct Modern Language Association (MLA) citation. Components graded for the presentation included good eye contact with the audience, clear voice, and at least one well prepared visual aid. The health teacher graded the reports and then gave them to the library media specialist to score websites using the Web Evaluation Rubric.

During the remainder of the week, the health teacher introduced the topic of smoking. Activities this week included discussion on why people smoke and establishing
healthy alternatives for each reason, dramatizing reasons for resisting smoking, and examining rights of the non-smoker.

**Teacher Scaffolded: Week 7**

Students accessed the library for information on smoking. For the smoking project, students worked in dyads. Requirements for this project included a three page single-spaced typed report with a bibliography in the Modern Language Association (MLA) format and a class presentation. Student choices on how they would present their findings included posters, *PowerPoint* presentations, a dramatization, or video. Students had difficulty on narrowing the topic of smoking and consulted with the health teacher or library media specialist. Some of the topics chosen by students included smoking as a social activity, habitual users, and addictive properties of tobacco. As in previous assignments, books were provided. Once their topic was selected, students used the Internet to locate pertinent websites. Groups discussed presentation options. During this unit, students used lunch time and after school hours to meet in the school library to work on their presentations. The library media specialist gave advice on presentation aesthetics. The same procedure was followed for grading the smoking presentations and evaluating the websites used in the bibliography that was used for the first aid topics.

**Teacher Scaffolded: Week 8**

Students remained in the health classroom and were instructed on alcohol abuse during Week 8. Representatives from the sheriff’s department came to the school and gave a presentation on the harmful effects of drinking and driving. A mock driving
course was set up in the gym, and students participated in driving go-carts while wearing goggles that simulated the vision of driving under the influence of alcohol at varying levels.

**Teacher Scaffolded: Week 9**

This week was the last week of the health class. The topic for this week was alcohol use. The students came to the library to research a subtopic related to alcohol or drug use. This project was an individual effort that required a minimum of a one page single-spaced typed report with at least one reference due at the end of the week. Because this project fell at the end of the grading period, the school library media center was at maximum capacity and little support was available during the research activity of the health students. The health teacher graded the students on their alcohol reports and then gave the reports to the library media specialist. Using the Web Evaluation Rubric (see Appendix A), websites provided in the bibliographies were scored. If more than one website was cited, the website that scored the highest points was recorded. Feedback was provided on the bibliography page concerning website choice. The rubric score and feedback was not included in the student's report grade.

**Web Scaffolded Group Procedure**

**Web Scaffolded: Week 1**

Week 1 began with the library media specialist introducing (a) an outline of library rules and procedures, (b) a review of Modern Language Association (MLA) style citation, and (c) an overview of the 9-week health research agenda to the web scaffolded group. After the introduction, students conducted their research for their first health topic;
mental health. Students were to find a current article addressing any of the following topics: fears, phobias, love, anger, guilt, defense mechanisms, peer pressure, or any topic dealing with emotions. Students then summarized the article in a one page single-spaced typed paper. A MLA format bibliography was included. MLA style was chosen because the entire school district uses this format for uniformity. At this point, no support was given to the students in choosing a website. The mental health reports were graded by the health teacher and then given to the library media specialist to score. The websites cited in the bibliographies were scored using the Web Evaluation Rubric (see Appendix A) to obtain a baseline score. This baseline score then served as an indicator of student ability to evaluate websites and was used as the pretest for this study.

*Web Scaffolded: Week 2*

The library media specialist provided a brief introduction on the importance of evaluating websites and then directed the students to the computers where a WebQuest was bookmarked for them. A WebQuest, as defined by Dodge & March (1997), is a scaffolded learning structure that uses links to essential resources on the World Wide Web and an authentic task to motivate students’ investigation of a central, open-ended question.

It was of utmost important to choose a quality WebQuest. In *Learning to Solve Problems with Technology: A Constructivist Approach* (Jonassen, Howland, Moore, & Marra, 2003), Joyce Valenza’s “A WebQuest about Evaluating Websites” (http://www.sdst.org/shs/library/evalwebstu.html) was highlighted as an exemplary WebQuest. It was designed for high school students to meet information and technology
standards across content areas (p. 43). The researcher examined the WebQuest and concluded it closely resembled the Ohio Department of Education lesson plan that was used with the teacher scaffolded group. The WebQuest also included the eight characteristics of scaffolding as defined by McKenzie (2000). The WebQuest was updated to insure links that worked and websites that were appropriate for the study (http://www.greenlocalschools.org/ghs/studentresources/library/evalwebstu.html).

The *introduction* (McKenzie scaffolding characteristic 2: purpose) in Valenza’s WebQuest is brief but to the point. It advises. “When you carefully select your resources, when you understand their strengths and limits, you create better products” (¶ 1). The *task* (McKenzie scaffolding characteristic 3: task) was defined for students by giving an overview of the procedures they will be following. *Resources*, in this case a list of websites, (McKenzie scaffolding characteristic 5: resources) were provided for students to complete the task. These websites were updated because some links had expired. The *process* (McKenzie scaffolding characteristic 1: clear directions) gave a step-by-step procedure of student tasks using the four specialist roles and provided the questions each specialist was to use to evaluate websites, and contained a link to the chart/organizer (see Appendix D). However, hard copies of these instructions were also provided to the students prior to logging into the WebQuest. The *evaluation* (McKenzie scaffolding characteristic 4) explained to students that they would be evaluated on group work, the completed organizer, and participation in the group discussion. The evaluation portion of the WebQuest also provided a link to the rubric that would be used in student evaluation.
The conclusion (McKenzie scaffolding characteristic 8) suggested additional sources that may be used and the importance of evaluating journals, books, videos and other sources.

As mentioned previously, Valenza’s WebQuest was updated due to expired links (McKenzie scaffolding characteristic 6: Lesson tested before implementation). Sites bookmarked varied in quality as defined by the Web Evaluation Rubric, they were linked to health project keywords (smoking and mental health), and each series of sites contained one quality website that would be appropriate for student use in their health project and one bogus website (McKenzie scaffolding characteristic 7: efficient by eliminating non-relevant materials).

The WebQuest introduced the concrete prompt in The Introduction and gave an explanation of the assignment in The Task. The WebQuest provided the evaluation chart and links to the websites to be evaluated. The websites pertained to topics that students would be researching during their 9-week health class. The library media specialist responded to student questions which generally had to do with logging on and finding the WebQuest. It was observed that there did not seem to be as much confusion as to roles and what websites to evaluate as in the teacher scaffolded group. There was the same laughter and confusion when the man with the four foot pickle came up on a home page. After reading the WebQuest instructions for student collaboration in their groups, the students proceeded to the library tables.

During student collaboration, the library media specialist met with each group of students to make sure they were on task. The students’ Web Evaluation Chart was examined to check for completion and accuracy of strengths and weaknesses of the
websites evaluated. Feedback was provided to each group on their rankings and each
group was instructed to appoint a spokesperson.

Each group spokesperson presented the top-ranked website selected by the group. Using the web evaluation form as a guide, the presenter discussed the strengths and weaknesses of the chosen website. All groups did a sufficient job of ranking their websites and providing justification for their number one choice. The sites had been evaluated by the library media specialist using the Web Evaluation Rubric and student rankings corresponded with these rankings.

After each group finished, the library media specialist completed the student assessment form to assign a score for each group’s effort (see Appendix F). The maximum score was 20 points which was included in the student’s health grade. The mean score for this activity was 18 points.

*Web Scaffolded: Week 3*

During Week 3, the web scaffolded group (WS) researched a topic relevant to nutrition and wrote a report. Each student was required to develop a bibliography with at least one reference. This was an individual project and students did not work together. The nutrition subtopic was chosen by the student with final approval given by the health teacher. Food additives, nutritional needs of athletes, and vegetarianism are some of the topics chosen. The library media specialist provided nutrition books and pamphlets that could be used by the students, but students used search engines to locate relevant websites on their topics. The library media specialist briefly reviewed the website
evaluation exercise performed the previous week and students were asked to employ those skills during this nutrition research activity.

During the rest of Week 3, students finished their reports and presented them to the class. The health teacher graded the students on their nutrition reports and then gave the reports to the library media specialist. Using the Web Evaluation Rubric (see Appendix A), websites provided in the bibliographies were scored. If more than one website was cited, the website that scored the highest points was recorded. Feedback was provided on the bibliography page concerning website choice. The rubric score and feedback were not included in the student’s report grade.

**Web Scaffolded: Week 4**

The health teacher provided first aid instruction in the health classroom. Objectives for this week included the students would be able to: identify and treat wounds, burns, and bone injuries; recognize potentially hazardous situations; and perform life-saving techniques. The teacher scaffolded group did not visit the school library media center during this week.

**Web Scaffolded: Week 5**

Students came to the library to research an assigned first aid topic. The topics addressed emergency situation responses to choking, burns, broken bones, sprains, etc. Students worked in dyads. In addition to completing a report, a visual aid was required. Once again, printed materials were available, but students instead relied heavily on the Internet.
Two days of library time were allotted; the first day was used for research and the second day for the creation of the visual aid and completion of the report. Some students worked on *PowerPoint* presentations, others pamphlets and posters. The library media specialist was consulted for technological advice and materials for visual aids. The same procedure for grading by the health teacher and web evaluation scoring by the library media specialist was followed as in Week 3. The remainder of Week 5 included the students finishing up their first aid project.

*Web Scaffolded: Week 6*

Students presented the results of their research in class. The health teacher graded the written reports and presentations. Components graded in the written report included scope of the topic; major points included; correct spelling, punctuation and grammar; and correct Modern Language Association (MLA) citation. Components graded for the presentation included good eye contact with the audience, clear voice, and at least one well prepared visual aid. The health teacher graded the reports and then gave them to the library media specialist to score the website using the Web Evaluation Rubric.

During the remainder of the week, the health teacher introduced the topic of smoking. Activities this week included discussion on why people smoke and establishing healthy alternatives for each reason, dramatizing reasons for resisting smoking, and examining the rights of the non-smoker.

*Web Scaffolded: Week 7*

Students accessed the library for information on smoking. For the smoking project, students worked in dyads. Once again they had choices on how they would
present their findings, including creating a video. The same procedural format that occurred in Week 5 for first aid was followed. Students had difficulty in narrowing the topic of smoking and consulted with the health teacher or library media specialist. As in previous assignments, books were provided. Once their topic was selected, students used the Internet to locate pertinent websites. Topics included peer pressure and smoking, second hand smoke, and smoking and heart disease. Groups discussed presentation options. During this unit, students used lunch time and after school hours to meet in the school library to work on their presentation. The library media specialist gave advice on presentation aesthetics. The same procedure for grading smoking presentations and evaluating websites was followed with the health teacher grading student work and the library media specialist scoring cited websites.

Web Scaffolded: Week 8

Students remained in the health classroom and were instructed on alcohol abuse. Representatives from the sheriff’s department came to the school and gave a presentation on the bad effects of drinking and driving. A mock driving course was set up in the gym, and students participated in driving go-carts while wearing goggles that simulated the vision of driving under the influence of alcohol at varying levels.

Web Scaffolded: Week 9

This week was the last week of the health class. The topic for this week was alcohol use. The students came to the library to research a subtopic related to alcohol or drug use. This project was again an individual effort with a report that was due at the end of the week. Because this project fell at the end of the grading period, the school library
media center was at maximum capacity and little support was available for the research activity of the health students. The same procedure for grading alcohol and drug reports and evaluating websites used was followed.

Nonscaffolded Group Procedure

*Nonscaffolded Group: Week 1*

Week 1 began with a library introduction to the nonscaffolded group (NS) that included (a) an outline of library rules and procedures, (b) a review of Modern Language Association (MLA) style citation, and (c) an overview of the 9-week health research agenda. This introduction was presented by the library media specialist. After the introduction, students conducted their research for their first health topic; mental health. Their assignment for this project was to find a current article on one of the following topics: fears, phobias, love, anger, guilt, grief, defense mechanism, peer pressure, or any topic dealing with emotions. The students were to locate the article and summarize it in a typed single-spaced page. At this point, no support was given students in choosing a website. This mental health report was due in two days.

The mental health reports were graded by the health teacher and then given to the library media specialist to score. The websites cited in bibliographies were scored using the Web Evaluation Rubric (see Appendix A) to obtain a baseline score. This baseline score then served as an indicator of student ability to evaluate websites and was used as the pretest in this study.
Nonscaffolded Group: Week 2

The nonscaffolded group (NS) did not come to the library media center this week. They remained in the health classroom and watched a video on nutrition on the day that the teacher scaffolded group (TS) and web scaffolded group (WS) received web evaluation instruction from the library media specialist.

Nonscaffolded Group: Week 3

During Week 3, the nonscaffolded group (NS) researched a topic relevant to nutrition. A current journal article or Internet site could be used and a summarization was to be typed with at least a one page single-spaced paper. Each student was required to develop a bibliography with at least one reference using the Modern Language Association (MLA) format. This was an individual project and students did not work together. The nutrition subtopic was chosen by the student with final approval given by the health teacher. Some of the topics were nutrition and cancer, healing foods, vitamins, and the food pyramid. The library media specialist provided nutrition books and pamphlets that could be used by the students, but students used bookmarked websites to research their topics. The bookmarked nutrition websites that were selected by the library media specialist scored an 8 on the web evaluation rubric. Websites chosen provided an array of nutrition topics within the website. For example, the Mayo Clinic website (www.mayoclinic.com) has excellent articles on nutrition.

During the rest of Week 3, students finished their reports and handed them in. The health teacher graded the nutrition reports and then gave the reports to the library media specialist. Using the Web Evaluation Rubric (see Appendix A), websites provided in the
bibliographies were scored. If more than one website was cited, the website that scored the highest points was recorded. Because 80% of the students used the bookmarked websites, 80% of the students received a score of 8 on the website used for their report. Feedback was provided on the bibliography page concerning website choice. The rubric score and feedback were not included in the student’s report grade.

_Nonscaffolded Group: Week 4_

The health teacher provided instruction in first aid in the health classroom. Objectives for this week included the students will be able to: identify and treat wounds, burns, and bone injuries; recognize potentially hazardous situations; and perform life-saving techniques. The nonscaffolded group did not visit the school library media center during this week.

_Nonscaffolded Group: Week 5_

Students came to the library to research an assigned first aid topic. The topics addressed emergency situation responses to choking, burns, broken bones, sprains, etc. Students worked in dyads. Requirements included a three page single-spaced typed report with a bibliography in the Modern Language Association (MLA) format. In addition to completing a report, an oral presentation with a visual aid was required. Once again, print materials were available, but students instead relied heavily on the Internet. Some students made use of charts that were provided in the vertical file for their visual aid. The library media specialist selected first aid websites that scored an 8 on the web evaluation rubric. Websites chosen provided an array of first aid topics within the website. For example, Kids Health Organization (http://kidshealth.org/parent/firstaid_safe/) provides
detailed instructions on procedures for emergency situations that are authored and reviewed by medical doctors.

Two days of library time were allotted; the first day was used for research and the second day for the creation of the visual aid. Some students worked on *PowerPoint* presentations, others on pamphlets or posters. The library media specialist was consulted for technological advice and materials for visual aids. The remainder of Week 5 included the students finishing up their first aid project.

*Non scaffolded Group: Week 6*

Students presented the results of their research in class. The health teacher graded the written reports and presentations. Components graded in the written report included scope of the topic; major points included; correct spelling, punctuation, and grammar; and correct Modern Language Association citation. Components graded for the presentation included good eye contact with the audience, clear voice, and at least one well prepared visual aid. The health teacher graded the reports and then gave them to the library media specialist to score the website using the Web Evaluation Rubric.

During the remainder of the week, the health teacher introduced the topic of smoking. Activities this week included discussion on why people smoke and establishing healthy alternatives for each reason, dramatizing reasons for resisting smoking, and examining rights of the non-smoker.

*Non scaffolded Group: Week 7*

Students accessed the library for information on smoking. For the smoking project, students worked in dyads. Requirements for this project included a three page
single-spaced typed report with a bibliography in the Modern Language Association format and a class presentation. Student choices on how they would present their findings included posters, PowerPoint presentations, a dramatization, or video. Topics on smoking included state laws on smoking, smoking and cancer, and chewing tobacco. As in previous assignments, books were provided. Once their topic was selected, students used the Internet to locate pertinent websites. Bookmarked websites were not provided. It was observed most students used the search engine Google. Groups discussed presentation options. During this unit, students used lunch time and after school hours to meet in the school library to work on their presentation. The library media specialist gave advice on presentation aesthetics. The same procedure for grading smoking presentations and evaluating websites was followed as for the treatment groups.

_Nonscaffolded Group: Week 8_

The non-scaffolded group remained in the health classroom and was instructed on alcohol use during Week 8. Representatives from the sheriff’s department came to the school and gave a presentation on the bad effects of drinking and driving. A mock driving course was set up in the gym, and students participated in driving go-carts while wearing goggles that simulated the vision of driving under the influence of alcohol at varying levels.

_Nonscaffolded Group: Week 9_

This week was the last week of the health class. The topic for this week was alcohol use. The students then came to the library to research a subtopic related to alcohol or drug use. This project was an individual effort with a minimum of a one page single-
spaced typed report with at least one reference. The assignment was due at the end of the week. Because this project fell at the end of the grading period, the school library media center was at maximum capacity and little support was available for the research activity of the health students. The health teacher graded the students on their alcohol reports and then gave the reports to the library media specialist. Using the Web Evaluation Rubric (see Appendix A), websites provided in the bibliographies were scored. If more than one website was cited, the website that scored the highest points was recorded. Feedback was provided on the bibliography page concerning website choice. The rubric score and feedback were not included in the student’s report grade.

Commonalities in Instruction

Peer tutoring, question prompts, and structured dialogue were strategies used in both the teacher scaffolded and web scaffolded groups. The nonscaffolded group did not receive these interventions. These strategies were chosen because they could be included in lessons that were delivered by a teacher or a web based source. Table 2 illustrates the assignments, websites, and scaffolding used in the three conditions.
Table 2

Assignments, Websites, and Scaffolding Used in the Three Groups

<table>
<thead>
<tr>
<th></th>
<th>CONTROL</th>
<th>TS</th>
<th>WS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WEEK 1: MENTAL HEALTH</strong></td>
<td>Instruction of responsible usage of Internet and MLA citation. Students then researched a topic relevant to mental health and wrote a report. Each student’s citation was scored using the rubric.</td>
<td>Instruction of responsible usage of Internet and MLA citation. Students then researched a topic relevant to mental health and wrote a report. Each student’s citation was scored using the rubric.</td>
<td>Instruction of responsible usage of Internet and MLA citation. Students then researched a topic relevant to mental health and wrote a report. Each student’s citation was scored using the rubric.</td>
</tr>
<tr>
<td>Assignment</td>
<td>Chart supplied with MLA citation format</td>
<td>Chart supplied with MLA citation format</td>
<td>Chart supplied with MLA citation format</td>
</tr>
<tr>
<td>Scaffolding</td>
<td>Student selection</td>
<td>Student selection</td>
<td>Student selection</td>
</tr>
<tr>
<td>Sites</td>
<td>No lesson</td>
<td>Lesson on web site evaluation delivered by the teacher librarian.</td>
<td>Lesson on web site evaluation delivered by a WebQuest.</td>
</tr>
<tr>
<td><strong>WEEK 2: LESSON</strong></td>
<td>None</td>
<td>Evaluation of four websites and group consensus and presentation on the top website.</td>
<td>Evaluation of four websites and group consensus and presentation on the top website.</td>
</tr>
<tr>
<td>Assignment</td>
<td>None</td>
<td>Concrete prompt, modeling, evaluation chart, websites, question prompts, structure of tutorial interaction, and feedback.</td>
<td>Concrete prompt, evaluation chart, websites, delivered by WebQuest. Collaborative groups, structure of tutorial interaction, and feedback.</td>
</tr>
<tr>
<td>Scaffolding</td>
<td>None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sites</td>
<td>None</td>
<td>Four websites were provided.</td>
<td>Four websites were provided.</td>
</tr>
</tbody>
</table>
### (Table 2 (continued))

**Assignments, Websites, and Scaffolding Used in the Three Groups**

<table>
<thead>
<tr>
<th>WEEK</th>
<th>CONTROL Assignment</th>
<th>TS Assignment</th>
<th>WS Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WEEK 3: NUTRITION</strong></td>
<td>Students researched a topic relevant to nutrition and created a product. Each student’s website was scored using the rubric.</td>
<td>Students researched a topic relevant to nutrition and created a product. Each student’s website was scored using the rubric.</td>
<td>Students researched a topic relevant to nutrition and created a product. Each student’s website was scored using the rubric.</td>
</tr>
<tr>
<td>Sites</td>
<td>Websites that scored an 8 on the web evaluation rubric were bookmarked for the students.</td>
<td>Student selected</td>
<td>Student selected</td>
</tr>
<tr>
<td><strong>Scaffolding</strong></td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td><strong>WEEK 5: 1ST AID</strong></td>
<td>Students researched a topic relevant to 1st aid and created a product. Each student’s website was scored using the rubric.</td>
<td>Students researched a topic relevant to 1st aid and created a product. Each student’s website was scored using the rubric.</td>
<td>Students researched a topic relevant to 1st aid and created a product. Each student’s website was scored using the rubric.</td>
</tr>
<tr>
<td>Sites</td>
<td>Web sites that scored an 8 on the web evaluation rubric were bookmarked for the students.</td>
<td>Student selected</td>
<td>Student selected</td>
</tr>
<tr>
<td><strong>Scaffolding</strong></td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td><strong>WEEK 7: SMOKING</strong></td>
<td>Students researched a topic relevant to smoking and created a product. Each student’s website was scored using the rubric.</td>
<td>Students researched a topic relevant to smoking and created a product. Each student’s website was scored using the rubric.</td>
<td>Students researched a topic relevant to smoking and created a product. Each student’s website was scored using the rubric.</td>
</tr>
<tr>
<td>Sites</td>
<td>Student selected</td>
<td>Student selected</td>
<td>Student selected</td>
</tr>
<tr>
<td><strong>Scaffolding</strong></td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td><strong>WEEK 9: ALCOHOL</strong></td>
<td>Students researched a topic relevant to alcohol and created a product. Each student’s website was scored using the rubric.</td>
<td>Students researched a topic relevant to alcohol and created a product. Each student’s website was scored using the rubric.</td>
<td>Students researched a topic relevant to alcohol and created a product. Each student’s website was scored using the rubric.</td>
</tr>
<tr>
<td>Sites</td>
<td>Student selected</td>
<td>Student selected</td>
<td>Student selected</td>
</tr>
</tbody>
</table>
Peer Tutoring

Both the web scaffolded and teacher scaffolded groups participated in peer tutoring as defined by King (1997). The framework for peer interaction was included in the ODE lesson plan and the WebQuest by providing students with questions to ask specific to their assigned roles and imparting this process to their peers. Both the teacher scaffolded group and the web scaffolded group participated in the following tutorial activities.

Structure of the tutorial interaction. Students took on specific roles when evaluating websites (authority/credibility specialist, bias/purpose specialist, content specialist, and usability/design specialist). Reciprocal roles were structured so students took turns being tutors and tutees. Procedures were defined such that students shared their role with other students while evaluating the given websites. Each student ranked their websites from one to four (one being the best), and then defended their choice to the rest of the group related to the criteria their role was assigned. The interactions were intended to promote mutual exchange of ideas, explanations, justifications, conclusions, and other high-level discussion and facilitate the construction of new knowledge (Vygotsky, 1978).

For both of the treatment groups, collaboration was an essential component for three out of five of the research projects (Weeks 2, 5, and 7). A structured peer tutoring only occurred in Week 2 during the intervention. Peer tutoring was not scaffolded in subsequent weeks.

Degree of student control or regulation of the process. Students had the opportunity to make decisions about the learning process when they selected who would
take which specialist role. They also decided who would present the groups’ findings. The teacher circulated to check whether groups were on task and to discuss their progress.

_Status within the tutor-tutee relationship._ Students were informed they would be working in groups for part of the lesson and asked to sit four to a table with people with whom they would like to work. Interaction is crucial to group learning so allowing student choice supports their comfort level. Students had the same status (they were all 10th-grade students) and were actual peers in age and high school attended.

_**Question Prompts**_

Both the WS and TS groups were provided with question prompts to aid in evaluating the four assigned websites. Each student received a sheet with questions particular to their role and a chart to organize their information (see Appendix C).

_Dialogue_

During Week 2, the TS and WS groups discussed their websites and individual rankings in their small group. Discourse was vital to rank the websites in a group ranking.

**Differences in Instruction**

The teacher scaffolded group depended on the library media specialist for web evaluation instruction. The web scaffolded group depended on the WebQuest site for their instruction, but the library media specialist spent approximately 20 minutes interacting with the group. The nonscaffolded group did not receive web evaluation instruction but was provided with websites that scored an 8 on the rubric. The predetermined websites were pertinent to their topics. The original intent of using a third
group was to have a control group. However, the researcher felt ethically bound to provide some support to the third group. Previous experience has shown that leaving students without any guidelines for searching led to incorrect information. Because this study was conducted during the entire health class semester, there was concern that no support would have a detrimental effect on student’s content knowledge of health issues. Bookmarked web sites were not provided for the NS group’s week 7 and 9 visit. Table 3 illustrates the two different scaffolding delivery methods utilized in the teacher scaffolded group and the web scaffolded group.
Table 3

Delivery Method of Teacher Scaffolded (TS) and Web Scaffolded (WS) Groups

<table>
<thead>
<tr>
<th>TS – 60 minutes with teacher</th>
<th>WS – 20 minutes with teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Library media specialist introduced the concrete prompt (identified the topic and the rationale for evaluation).</td>
<td>WebQuest introduced the concrete prompt in The Introduction.</td>
</tr>
<tr>
<td>Library media specialist modeled the evaluation of a website.</td>
<td>WebQuest gave an explanation of the assignment in The Task.</td>
</tr>
<tr>
<td>Library media specialist thought aloud as she went over the different components of a website.</td>
<td></td>
</tr>
<tr>
<td>The evaluation chart was distributed by the library media specialist.</td>
<td>WebQuest provided the evaluation chart. Students also provided with a hard copy.</td>
</tr>
<tr>
<td>Library media specialist bookmarked the site to be evaluated.</td>
<td>WebQuest provided links to the sites to be evaluated.</td>
</tr>
<tr>
<td>Library media specialist touched base with each student as they worked and provided feedback.</td>
<td>Library media specialist responded to students with questions.</td>
</tr>
<tr>
<td>Library media specialist gave guidelines for student collaboration in their groups.</td>
<td>WebQuest gave guidelines for student collaboration in their groups.</td>
</tr>
<tr>
<td>Library media specialist conferenced with each group of students.</td>
<td>Library media specialist answered any group questions.</td>
</tr>
<tr>
<td>Library media specialist provided feedback to group presentations.</td>
<td>Library media specialist provided feedback to group presentations.</td>
</tr>
</tbody>
</table>

Note. The non-scaffolded group did not receive any of the above instruction.

Experimental Design and Data Analysis

This study featured a quasi-experimental design including three treatments: teacher scaffolded, web scaffolded, and nonscaffolded learning. The dependent measure includes a rubric that assessed authenticity of information, bias, and currency of websites. Data from this study were analyzed with one-way ANOVA procedures. Follow-up
multiple comparisons were performed with the Scheffé method. All student reports included a website as a reference.
CHAPTER IV

RESULTS

Introduction

This study’s objective was to determine differential effects of scaffolding strategies on the evaluation of websites by students in the context of information literacy instruction delivered in the library media center. Participants included 73 (35 female and 38 male) 10th-grade health students from a predominately White suburban high school. Three intact groups were exposed to different scaffolding strategies: (a) a teacher mediated scaffold lesson that demanded 60 minutes of the librarian’s attention; (b) a web mediated scaffold lesson that demanded 20 minutes of the librarian’s attention; and (c) a nonscaffolded group that required 5 minutes of the librarian’s attention. After instruction, the three groups completed four research assignments that involved using the Internet.

The teacher scaffolded (TS) group was lectured on the importance of web evaluation by the library media specialist. She then modeled the correct procedure to evaluate a website and the different qualities to look for in a website: authenticity, bias, currency, and aesthetics. Individual students evaluated each of four assigned websites on one of the above qualities. The websites were then ranked by each student using the provided ranking chart. Then students met as groups of four and came to a consensus on the top website using rubrics as guides. This consensus was presented to the rest of the class by a group representative.
The web scaffolded group (WS) was directed to go to the computers and log onto a WebQuest site on evaluating websites. The procedure of the WebQuest followed the same procedure as the TS group; however, instructions for the activities were delivered via Web rather than teacher delivered. The library media specialist supervised the group work of ranking the sites and presenting results.

The nonscaffolded group (NS) did not receive any instruction in web evaluation. They did receive support from the library media specialist during their research if they had any questions. This group was provided with high quality websites to use in subsequent research in the hope that, inductively, students would recognize a high quality website. The high quality websites were removed for the last two research assignments and students located their own resources.

Analysis

Websites students used for their first research assignment (before intervention) were scored using the website rubric. Descriptive statistics showed the mean for the pretest raw score as 3.6 for the teacher scaffolded group, 3.16 for the web scaffolded group, and 3.75 for the nonscaffolded group. Analyses using analysis of variance (ANOVA) indicated no significant differences between the groups on the pretest measures (see Appendix I). The F score was 1.96 with a significance of .149.

Homogeneity of variances was tested by Levene’s test, an ANOVA conducted on the absolute differences between the observed data and the mean from which the data came. The variances of the three groups for Assignment 1 website’s scores had a significance of .905 which indicated the homogeneity.
Table 4

Analysis of Covariance for Pretest Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>82.411 *</td>
<td>3</td>
<td>27.470</td>
<td>32.820</td>
<td>.000</td>
</tr>
<tr>
<td>Intercept</td>
<td>237.827</td>
<td>1</td>
<td>237.827</td>
<td>284.140</td>
<td>.000</td>
</tr>
<tr>
<td>Week 1 (pretest)</td>
<td>.001</td>
<td>1</td>
<td>.001</td>
<td>.001</td>
<td>.977</td>
</tr>
<tr>
<td>Group</td>
<td>80.161</td>
<td>2</td>
<td>40.081</td>
<td>47.885</td>
<td>.000</td>
</tr>
<tr>
<td>Error</td>
<td>57.754</td>
<td>69</td>
<td>.837</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3192.000</td>
<td>73</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>140.164</td>
<td>72</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* R Squared = .588 (Adjusted R Squared = .570)

An ANCOVA was also run to reduce preexisting systematic bias that may exist between groups before the study began. Table 4 shows that there was no difference in the adjusted means.

As stated in chapter 3, a rubric was designed to rate websites using authenticity, bias, and currency as components (see Appendix A). The rubric used a scale of 0-8. As stated earlier, the pretest raw means of the websites used by the three groups were: 3.16 for the teacher scaffolded group, 3.6 for the web scaffolded group, and 3.75 for the nonscaffolded group. If we align these scores on the school grading scale of 8 = 100%, these results illustrate that the students cited websites that scored 47%, 40%, and 45%
respectively. Using the grading scale of the school (65% and below is failing), all three groups “failed” website evaluation.

No significant differences were found in the pretest web evaluation scores among the three groups, indicating equivalency across these arbitrarily formed groups prior to intervention. Therefore the groups were statistically similar prior to intervention.

Question 1: Which scaffolding treatment, teacher scaffolded, web scaffolded or nonscaffolded, leads to the selection of the best websites?

Posttest scores for Week 3 show no significant differences when sites were bookmarked (Tables 5 and 6); however, Weeks 5, 7, and 9 show significant differences (Table 7). The F scores were 11.84, 30.22, and 49.94 respectively with p-values of 0 which are all less than .05. This means that there is less than a 0.01% chance that an F-ratio of this size would have occurred by chance.

Table 5

**Descriptive Statistics for Week 3 Web Evaluation Scores**

<table>
<thead>
<tr>
<th></th>
<th>TS</th>
<th>WS</th>
<th>NS</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>7.44</td>
<td>6.75</td>
<td>7.1</td>
<td>7.0822</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>.506</td>
<td>.927</td>
<td>1.74</td>
<td>1.14</td>
</tr>
<tr>
<td>Number</td>
<td>25</td>
<td>28</td>
<td>20</td>
<td>73</td>
</tr>
</tbody>
</table>
Table 6

*Analysis of Variance for Week 3 Web Evaluation Scores*

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>6.297</td>
<td>2</td>
<td>3.148</td>
<td>2.527</td>
<td>.087</td>
</tr>
<tr>
<td>Within Groups</td>
<td>87.210</td>
<td>70</td>
<td>1.246</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>93.507</td>
<td>72</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A post-hoc test was run because although ANOVA showed there were significant differences among the three groups, it cannot tell us which group means are different.

The Scheffé was run to identify the differences (see Appendix J).

The Scheffé procedure revealed that the website evaluation scores of the NS group differed significantly from the treatment groups at Week 5. A look at the descriptive analysis showed that the NS group’s scores were significantly higher (see Table 7). At Week 7 and 9, there were significant differences between the NS group and the treatment groups; the treatment groups’ scores were significantly higher.

Both the teacher scaffolded and web scaffolded web evaluation scores improved significantly. The nonscaffolded group’s web evaluation scores did not.

Question 2: Which scaffolding method, teacher scaffolded - web scaffolded, or nonscaffolded - produces the greatest retention of web evaluation skills?

A repeated measures analysis was run on the web evaluation scores to determine retention of the lesson (see Figure 1). The teacher scaffolded group made the greatest
Table 7

Descriptive Statistics for Nonscaffolded (NS), Teacher Scaffolded (TS), and Web Scaffolded (WS) Groups

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>95% Confidence Interval for Mean</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 1</td>
<td>NS</td>
<td>20</td>
<td>3.7500</td>
<td>1.11803</td>
<td>0.2500</td>
<td>3.2267</td>
<td>4.2733</td>
</tr>
<tr>
<td></td>
<td>TS</td>
<td>25</td>
<td>3.1600</td>
<td>1.14310</td>
<td>0.22862</td>
<td>2.6882</td>
<td>3.6318</td>
</tr>
<tr>
<td></td>
<td>WS</td>
<td>28</td>
<td>3.6071</td>
<td>0.95604</td>
<td>0.18068</td>
<td>3.2364</td>
<td>3.9779</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>73</td>
<td>3.4932</td>
<td>1.08171</td>
<td>0.12660</td>
<td>3.2408</td>
<td>3.7455</td>
</tr>
<tr>
<td>Week 3</td>
<td>NS</td>
<td>20</td>
<td>7.1000</td>
<td>1.74416</td>
<td>0.39001</td>
<td>6.2837</td>
<td>7.9163</td>
</tr>
<tr>
<td></td>
<td>TS</td>
<td>25</td>
<td>7.4400</td>
<td>0.50662</td>
<td>0.10132</td>
<td>7.2309</td>
<td>7.6491</td>
</tr>
<tr>
<td></td>
<td>WS</td>
<td>28</td>
<td>6.7500</td>
<td>0.92796</td>
<td>0.17537</td>
<td>6.3902</td>
<td>7.1098</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>73</td>
<td>7.0822</td>
<td>1.13961</td>
<td>0.13338</td>
<td>6.8163</td>
<td>7.3481</td>
</tr>
<tr>
<td>Week 5</td>
<td>NS</td>
<td>20</td>
<td>7.9500</td>
<td>0.22361</td>
<td>0.05000</td>
<td>7.8453</td>
<td>8.0547</td>
</tr>
<tr>
<td></td>
<td>TS</td>
<td>25</td>
<td>7.4400</td>
<td>0.50662</td>
<td>0.10132</td>
<td>7.2309</td>
<td>7.6491</td>
</tr>
<tr>
<td></td>
<td>WS</td>
<td>28</td>
<td>7.1429</td>
<td>0.75593</td>
<td>0.14286</td>
<td>6.8497</td>
<td>7.4360</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>73</td>
<td>7.4658</td>
<td>0.64726</td>
<td>0.07576</td>
<td>7.3147</td>
<td>7.6168</td>
</tr>
<tr>
<td>Week 7</td>
<td>NS</td>
<td>20</td>
<td>5.0500</td>
<td>1.43178</td>
<td>0.32016</td>
<td>4.3799</td>
<td>5.7201</td>
</tr>
<tr>
<td></td>
<td>TS</td>
<td>25</td>
<td>7.3200</td>
<td>0.62716</td>
<td>0.12543</td>
<td>7.0611</td>
<td>7.5789</td>
</tr>
<tr>
<td></td>
<td>WS</td>
<td>28</td>
<td>6.8929</td>
<td>0.95604</td>
<td>0.18068</td>
<td>6.5221</td>
<td>7.2636</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>73</td>
<td>6.5342</td>
<td>1.37520</td>
<td>0.16095</td>
<td>6.2134</td>
<td>6.8551</td>
</tr>
<tr>
<td>Week 9</td>
<td>NS</td>
<td>20</td>
<td>4.7500</td>
<td>1.37171</td>
<td>0.30672</td>
<td>4.1080</td>
<td>5.3920</td>
</tr>
<tr>
<td></td>
<td>TS</td>
<td>25</td>
<td>7.2800</td>
<td>0.45826</td>
<td>0.09165</td>
<td>7.0908</td>
<td>7.4692</td>
</tr>
<tr>
<td></td>
<td>WS</td>
<td>28</td>
<td>6.9643</td>
<td>0.79266</td>
<td>0.14980</td>
<td>6.6569</td>
<td>7.2716</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>73</td>
<td>6.4658</td>
<td>1.39525</td>
<td>0.16330</td>
<td>6.1402</td>
<td>6.7913</td>
</tr>
</tbody>
</table>
Figure 1. Estimated marginal means of website evaluation scores for the teacher scaffolded (TS), web scaffolded (WS), and nonscaffolded (NS) group over the nine week period.

gain by beginning with a mean of 3.16 (Week 1), raising the mean to 7.44 one week after instruction (Week 3), maintaining the mean of 7.44 (Week 5) three weeks after instruction, decreasing to a mean of 7.32 five weeks after instruction (Week 7), and then to a mean of 7.28 seven weeks after instruction (Week 9).

The web scaffolded group also made gains by beginning with a mean of 3.6 (Week 1), raising the mean to 6.75 one week after instruction (Week 3) slightly
increasing to the mean of 7.14 (Week 5) three weeks after instruction, slightly decreasing to a mean of 6.89 five weeks after instruction (Week 7), and then rebounding to a mean of 6.96 seven weeks after instruction (Week 9).

The nonscaffolded learner group started out with the highest pretest score, 3.75 (Week 1), but once the bookmarked websites were removed (Week 7), scores decreased. Week 3 mean score was 7.1 (bookmarked site) and Week 5 mean score was 7.9 (bookmarked site). The NS group then searched on their own, as the other two groups had all along. Week 7 mean was 5.05 and Week 9 mean was 4.75. Figure 1 provides a graph of the three groups’ web evaluation score means during the 9-week period.

The scaffolded groups performed significantly better than the nonscaffolded group for longevity of the acquired skill.

Question 3: Which scaffolding strategy - teacher scaffolded or web scaffolded - is more efficient?

The individual web evaluation mean scores for week 9 were divided by the recorded amount of time in minutes the instructor delivered the lesson to yield an efficiency score. An ANOVA was then used to analyze the resulting quotients. Results are shown in Tables 8 and 9.

The mean efficiency score for the teacher scaffolded group is .1213, and for the web scaffolded group it is .3482. The ANOVA shows the p-value at .000 so we can see that the web scaffolded group is statistically more efficient than the teacher scaffolded group.
Table 8

Descriptive Statistics for Efficiency of Scaffolding Strategies

<table>
<thead>
<tr>
<th></th>
<th>TS</th>
<th>WS</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>.1213</td>
<td>.3482</td>
<td>.2412</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>.00764</td>
<td>.03963</td>
<td>.11797</td>
</tr>
<tr>
<td>Number</td>
<td>25</td>
<td>28</td>
<td>53</td>
</tr>
</tbody>
</table>

Table 9

Analysis of Variance for Efficiency of Scaffolding Strategies

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>.680</td>
<td>1</td>
<td>.680</td>
<td>791.422</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>.044</td>
<td>51</td>
<td>.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>.724</td>
<td>52</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summary

In summary, this chapter provided the data analysis that was used to answer the following questions: (a) Which scaffolding treatment - teacher scaffolded or web scaffolded - leads to the selection of the best websites? There was no significant difference between the scaffolding treatment groups in selecting the best websites. (b) Which scaffolding method - teacher scaffolded or web scaffolded - produces the greatest
retention of web evaluation skills? There was no significant difference between the teacher scaffolded and the web scaffolded groups with retention of web evaluation skills.

(c) Which group scaffolding - teacher scaffolded or web scaffolded - is more efficient?

The web scaffolded group is statistically more efficient than the teacher scaffolded group.

The final chapter addresses the above questions, contributions of the study, and possible future research needs based on the findings of the study.
CHAPTER V
DISCUSSION

Introduction

The goal of this study was to observe if there was a significant difference between two scaffolding methods for web evaluation achievement and retention in high school students. This chapter discusses the results of the differential effectiveness of three instructional approaches to website evaluation: (a) a teacher scaffolded approach; (b) a web scaffolded approach; and (c) a nonscaffolded approach. This study examined student success in evaluating web sites, longevity of the acquired skill over a nine week period, and the relationship between instructional time and student achievement. The implications of the results and suggestions for future research for each research question are addressed separately.

Pretest Findings and Implications

Before the instructional strategy was implemented, the pretest data indicated that those websites chosen by 10th-graders did not include all of the following: authenticity of information, bias, and currency. In this study, pretest websites chosen by students to use in their research scored an average of 3.5 on an 8-point scale. It is necessary that instructional strategies are identified to teach students effective use of the Internet. They need to know how to find the right information for the right purpose at the right time
even though they are deluged with information. Observation has indicated that the Internet is their main source of information for school projects and personal use.

As mentioned in chapter 3, participants in this present study were instructed the previous year on website evaluation by an accredited library media specialist with what was believed to be an effective lesson plan (see Appendix G). The lesson introduced students to the EBSCO database and discussed its advantages over using a search engine for research. Components of reliable websites were discussed and how it may be difficult to find a website using a search engine. Pretest scores in the current study indicate that students did not acquire and/or retain web evaluation skills in the one ninety minute lesson taught the previous school year. Previous studies (Brown, 2001; Yitshaki & Bibi, 2001) have indicated the lack of teacher training resulted in an ineffective instruction and thus a lack of student information literacy skills. That may be a possibility for the students’ inability to identify high quality websites.

Which Scaffolding Treatment, Teacher Scaffolded or Web Scaffolded, Leads to the Selection of the Best Websites?

The primary purpose of this study was to examine the differential effects of two scaffolded delivery methods. Findings from this study indicated that both the teacher scaffolded and web scaffolded website evaluation scores significantly improved after intervention and continued to use high quality websites until the end of the nine week period. There was no significant difference between the mean scores of websites selected by the scaffolded groups. The nonscaffolded group’s scores improved after using the
bookmarked sites, but dropped drastically after this support was removed. It appeared that both scaffolding methods were useful in student achievement of web evaluation.

The teacher scaffolded group raised their pretest mean score of 3.16 to the final score of 7.28. Evaluating this on the 100% grading scale used in the school, the score went from 39% to 91% of the possible points on the rubric. The web scaffolded group raised their pretest mean score from 3.6 to 6.96; 46% to 87%. The nonscaffolded group’s pretest mean score was 3.75 (47%), and their final mean score was 4.75 (59%).

The nonscaffolded group was not taught web evaluation skills, but the hope was that having quality websites provided to them for the first three assignments would lead to students inductively establishing guidelines for a quality website. The library media specialist was available for help in locating resources for research topics, but did not go through the steps of how to evaluate a website. As the results indicate, student web evaluation was not achieved. Their performances lend credibility to Loertscher and Woll’s (2002) statement, “Library media specialists who concentrate on helping students locate information but do not participate in the higher-order thinking activities miss the best part of the learning process” (p. 30).

The analysis showed that the website evaluation scores of the NS group differed significantly from the treatment groups at Weeks 5, 7, and 9. Interestingly, the NS group’s scores were significantly higher at Week 5, but at Week 7 and 9 the treatment groups’ scores were significantly higher. As mentioned earlier, quality websites that scored an 8 on the web evaluation rubric were provided to the NS group. The treatment groups were on their own in searching for information, but the hope was that they would
use the web evaluation skills taught to them three weeks prior. As the scores indicate, this did occur. They retained their ability to find high quality web sites for the duration of the study. However, once the bookmarked sites were unavailable to the nonscaffolded group, their scores dropped significantly.

The differences are easily explainable at Week 7 and 9. At this point, bookmarked health websites for the NS were removed. This nonscaffolded group had not been instructed on website evaluation and using the quality bookmarked sites for the previous two assignments provided the high scores at Week 3 and 5. Once this support was removed, the NS group returned to their low pretest scores. In other words, while the NS group had quality websites bookmarked for them, their resource for their assignment was a quality website. When this support was removed, the resources they found and used for their assignment were not a quality websites.

The NS group scores were significantly higher at Week 5. Once again, the NS group was provided with bookmarked sites that scored an 8 on the web evaluation rubric, and students chose to use them as evidenced by a mean score of 7.95. An examination of the websites used by the NS group revealed that many did not use the provided bookmarked websites resulting in a mean score of 7.1 during Week 3. The TS and WS groups scored a mean average of 7.44 and 7.14 respectively. Whereas this was a significant improvement over their pretest scores of 3.6 and 3.16, it was still lower than the NS group. However, at this point they were still learning. As their web sites were scored, the library media specialist provided feedback about the sites they chose.
During Weeks 7 and 9, there was no surprise that the scaffolded groups performed significantly better than the nonscaffolded group because of all the literature, theories, and studies that support the positive effects of scaffolding (Berk, 1995; Chang et al., 2001; King, 1997; Rosenshine & Meister, 1992). However, what was surprising to this author was the group that received the scaffolding strategies from the teacher did not perform significantly better than the group that received scaffolding techniques via a web-based learning environment. The author had conjectured that quality instruction time with the teacher would benefit student achievement more than that instruction provided by a web site. However, the analysis of data does not support this conjecture.

Data from the current study has supported the theoretical foundations of constructivism that learning occurs in an environment of active investigation and thought. Scaffolding is an active process that aids knowledge to be constructed in the classroom through various strategies (Sharpe, 2006). To promote further understanding of this study’s results, one may look at Wells’ (2002) views of this active environment. Wells posited that there are two levels to scaffolding; the macro level which refers to the instructional design of the lesson, and the micro level which refers to the spontaneous interactions between teacher and student and student and student.

As mentioned earlier, the researcher was surprised that the TS group did not perform significantly higher than the WS group. If we look at Wells’ (2002) description of what occurs at the micro level, it is difficult to explain the lack of differential effectiveness between the two groups. This “point of need” scaffolding affords the teacher the opportunity to further student understanding of the task through a variety of
strategies that accommodate the circumstances. The teacher scaffolded group received more interaction at the micro level. However, for both groups, the teacher was available after initial instruction as they worked on their project. She answered questions and circulated to check on student progress. Spontaneous discourse supported the students through the process. Students also took advantage of peer aid by asking questions or discussing certain aspects of the assignment. Perhaps there was not enough of a difference between the micro levels since they were similar for part of the time.

Teacher interaction was also very important in the cooperative learning feature of which both the TS and WS groups were a part. Gillies and Boyle’s (2005) study indicated that cooperative learning activities were not sufficient alone for student achievement. The instructor needs to be involved in demonstrating and modeling skills that challenge and probe the student’s inner cognitive self. The researcher feels this was accomplished in both the TS and WS web evaluation lessons by the class presentations that modeled their groups’ process of finding quality web sites.

Previous research indicates mixed results when comparing outcomes of teacher versus web-based delivery methods. Sayre and Brush (2002) concluded that embedding scaffolded strategies into a hypermedia environment assists students’ understanding of disciplined inquiry, but spontaneous support needs a skilled teacher. Land and Zembal-Saul (2001) noted that inadequacy of student explanations in computer-based learning environments could go unnoticed without teacher interactions. Other researchers found favorable results with scaffolding in a web-based environment, but there was no
comparison to a teacher-scaffolded group (Azevedo et al., 2003; Brinkerhoff & Glazewski, 2001; Chang et al., 2001; Zydney, 2005).

Implications from this study may allow instructors to set up quality scaffolded web-based learning environments to teach students in an efficient and effective manner. Instructions on created WebQuests are readily available and very user friendly. Bernie Dodge is still very active in providing seminars online and in person (eTech, 2008). An earlier quote (Loertscher & Wolls, 2002) stressed the importance of active participation of the school library media specialist in the research process. This researcher believes the key word is “participation.” In the teacher scaffolded and web scaffolded lessons, the teacher’s instructional time of the lesson was different; however, teacher participation in the careful analysis, design, development, implementation, and evaluation of both lessons was equal.

The researcher feels that the well-designed WebQuest used for the study was an immense contribution to the success of student achievement in website evaluation. As mentioned in chapter 2, Zheng et al. (2006) addressed the discrepancies between WebQuests and the importance of correctly designing the WebQuest in the constructivist design that was intended. Future studies could explore designing lessons with different hypermedia environments and compare student achievement.

Which Scaffolding Method, Teacher Scaffolded or Web Scaffolded, Produces the Greatest Retention of Web Evaluation Skills?

Not only do we need to teach students a skill but equally important is their ability to retain the skill after it has been taught. There was no significant difference between the
scaffolded groups’ retention of web evaluation skills. Once again the scaffolded groups performed significantly better than the nonscaffolded group for longevity of the acquired skill. A repeated measures analysis was run to determine retention of the lesson. The teacher scaffolded group made the greatest gain by beginning with a mean of 3.16 (Week 1), raising the mean to 7.44 one week after instruction (Week 3), maintaining the mean of 7.44 (Week 5) three weeks after instruction, showed a slight decrease with a mean of 7.32 five weeks after instruction, and then a mean of 7.28 seven weeks after instruction.

The web scaffolded group also made gains by beginning with a mean of 3.36 (Week 1), raising the mean to 6.75 one week after instruction (Week 3), maintaining the mean of 7.14 (Week 5) three weeks after instruction, showed a slight decrease with a mean of 6.89 five weeks after instruction, and then a mean of 6.96 seven weeks after instruction.

The nonscaffolded group started out with the highest pretest score, 3.75 (Week 1), but once the bookmarked websites were removed, scores generally decreased. Week 3 mean score was 7.1 (bookmarked site) and Week 5 mean score was 7.9 (bookmarked site). The group then searched on their own, as the other two groups did. Week 7 mean was 5.05 and Week 9 was 4.75. This is not unexpected because the data indicates that the NS group did not acquire the skill so therefore could not retain it.

Findings from this study indicate that students will retain the skill longer when taught with scaffolded methods. Fading is considered by many as an important component of scaffolding (Puntambekar & Hübscher, 2005; Sherin et al., 2004). As mentioned in chapter 2, Vygotsky (1978) defined internalization as the process of
constructing an internal (cognitive) representation of physical actions or mental
operations that first occur in social interactions. Through internalizing elements of social
interactions, children develop ways of regulating their own behavior and thinking. Wood
et al. (1976) expanded on the transfer of responsibility from teacher to student by
conjecturing that the student not only internalizes the specific task but the process of
completing other similar tasks. Results from this study support the theory that
internalizing the specific task aids in other similar tasks as evidenced by the ability of the
scaffolded groups to effectively evaluate websites for four assignments in the space of
eight weeks after intervention. However, as mentioned in chapter 2, a limitation of the
study is that student scores were monitored for a nine week period. Using a longer time
period would have added validity to the results. Future studies could track the students
into their next year of school to check for retention of web evaluation skills. Another
option is to check websites students cited in other academic assignments to analyze
transfer of knowledge.

Which Group Scaffolding, Teacher Scaffolded or Web Scaffolded, is More Efficient?

Each subject’s individual mean web evaluation score was divided by the amount
of instructor time. Then an ANOVA was run to determine the most efficient scaffolding
method. The mean for the teacher scaffolded group was .1213 and the mean for the web
scaffolded group was .3482. This was a significantly more efficient approach as shown
by the p-value of .000. Web scaffolding was more efficient than teacher scaffolding.
Conclusion

Many questions are still unanswered, but future research might provide answers. Neither this study nor those cited established: the characteristics of information literate students, the best way to train professionals to teach information literacy, and the effect of integrating website evaluation into every class assignment. An interesting study would explore training all teaching personnel in an institution on web site evaluation. Teachers would then require students to evaluate resources used for assignments. Student web evaluation scores could be tracked for a year in all classes. Would this lay a foundation for lifetime web evaluation?

Small (1999) suggested that satisfaction strategies such as natural consequences, positive consequences, and equity may have more long-lasting effects. In further studies, the aforementioned strategies could be used as variables to investigate their effect on longevity of an acquired skill.

Student attitudes and reactions toward the lesson implemented were not surveyed. This could be an additional component to any of the above suggested studies.

In this study the time devoted by the library media specialist to the instructional design was not accounted for because the lessons were designed by others. Further research could duplicate the study and take instructional design time into account. It may find that there were more “before intervention” implementation hours in the web scaffolded group than the teacher scaffolded group. However, the efficiency of how a web based lesson may be used over and over again would more than make up for the before intervention hours.
As mentioned in chapter 1, the lack of funds for school library programs make it essential to create lessons efficient in instructor time. Further research may focus on the following areas: materials that maximize the rate of learning; media that can teach content at the highest rate given time constraints; media/materials that can aid learners increase the absorption rate of learning.

The current research study is an attempt to pragmatically offer solutions to school library media specialists on the best way to instruct information literacy skills. This paper provides data that can drive curricular decisions and step-by-step procedures are included so the study and the lessons are easily duplicated. Although this research focused specifically on web evaluation, it may be applied to other information literacy skills.

Librarian participants in a study (Turner, 2002) were asked to indicate their amount of research use; their motivations for and against consulting the research; and their opinions concerning the relationship between library information science research and practice, and how it might be improved. Responses indicated that applied research that helps with daily problems is the most valuable but that most research inadequately addresses the real concerns of practice, or that it is not presented in ways that foster understanding and application.

It was not the intent of this study to create a process for designing, developing, implementing, and evaluating website evaluation instruction in the context of the library media center. In order to accomplish this, different instructional designs needed to be investigated. Todd (2002) advocated library media specialists to “research informing practice, and practice informing research” (p. 2). It is within the realm of the profession
to conduct micro-research reports to investigate student success of information literacy proficiencies both within and outside the classroom setting. If members of a profession are not in the position to conduct a study, then they may avail themselves of studies conducted by others.

In addition, the results of this study suggest that lessons created using a constructivist approach to instructional design principles guide students to task achievement and retention. The teacher scaffolded and web scaffolded environments provided knowledge building tools and allowed the learner to be an active, changing entity. Practitioners can expand results from this study to other subject areas while retaining the scaffolding components, and increase the likelihood of similar results.
APPENDICES
APPENDIX A

WEB EVALUATION RUBRIC
<table>
<thead>
<tr>
<th>#</th>
<th>AUTHENTICITY</th>
<th>Pretest</th>
<th>Week 1</th>
<th>Week 3</th>
<th>Week 5</th>
<th>Week 7</th>
<th>Week 9</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1. Is an author listed in a byline?</td>
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<td>2. Does the author or sponsor have an authority (background, education,</td>
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<td>credentials) to write about the topic?</td>
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<td>3. Does the author or sponsor provide a source for the material that was</td>
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<td>4. Is the information error-free (no spelling, grammar, or typing errors)?</td>
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<td>5. Is the same information found on at least two other sites or print</td>
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<td>6. Was this site created to inform rather than to sell or promote a</td>
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<td>product?</td>
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<td>7. Are both sides of an argument presented?</td>
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<td>8. Was the site updated in the past calendar year?</td>
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<td>Total Points (8 possible)</td>
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</table>
APPENDIX B

TEACHER SCAFFOLDED LESSON PLAN
## Ohio Standards Connections

### Reading Applications:
Informational, Technical and Persuasive Text

### Benchmark A
Evaluate how features and characteristics make information accessible and usable and how structures help authors achieve their purposes.

### Indicator 7
Analyze the effectiveness of the features (e.g., format, graphics, sequence, headers) used in various consumer documents (e.g., warranties, product information, instructional materials), functional or workplace documents (e.g., job-related materials, memoranda, instructions) and public documents (e.g., speeches or newspaper editorials).

## Lesson Summary:

Students evaluate the content, credibility, bias, and usability of Web sites. Working as individuals and as part of a team, students share their results and reach consensus on the quality and value of Web sites given as potential research sources.

**Estimated Duration:** 90 minutes

## Commentary:

“The Web site evaluation chart is probably one of the best features of the lesson because it offers specific areas of the site for the students to evaluate.”

“The concept of [evaluating] credibility on the Internet is good . . . reliability [is] a very important quality for research sources.”

## Post-Assessment:

Student completion of:
- *Home Team Web Site Specialist Handout, Appendix C;*
- *Ranking Web Sites Chart, Appendix D.*

## Sample Scoring Criteria:

- Assessment Sheet.
- *Evaluating Sites Task Assessment Form, Attachment F.*
Instructional Tips:
• Prior to beginning this lesson, select four Websites worth your students’ attention.
• Read through this entire lesson before you make your selections.
• Add Web addresses (URLs) to appropriate attachments.

Instructional Procedures:
1. Using projection equipment or printed sheets, discuss and model the Ranking Websites Chart, Appendix D.

2. Discuss specialist roles and duties found on the Home Team Website Specialist Handout, Appendix C.

3. Assign students to four or five-member teams.

<table>
<thead>
<tr>
<th>Student #1 Specialist roles</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student #2 Specialist roles</td>
<td>Usability</td>
</tr>
<tr>
<td>Student #3 Specialist roles</td>
<td>Bias</td>
</tr>
<tr>
<td>Student #4 Specialist roles</td>
<td>Authority</td>
</tr>
<tr>
<td>Student #5 Specialist roles</td>
<td>Content</td>
</tr>
</tbody>
</table>

4. Using classroom computers or a computer lab, students complete the Ranking Websites Chart, Appendix D, as they work individually through each of their specialist roles.

5. Students work together in their groups to reach consensus on their rankings. They record this ranking on the Ranking Websites Chart, Attachment D.

6. Each group selects and sends a representative to display group results on a class ranking chart. A spokesperson from the group briefly explains his or her groups ranking.

7. The teacher facilitates a class discussion around each group’s decisions.
8. Students compare original rankings with class rankings, and develop a statement or explanation of each difference on the back of their *Ranking Websites Chart*, Appendix D.

**Differentiated Instructional Support:**
Instruction is differentiated according to learner needs to help all learners either meet the intent of the specified indicator(s) or, if the indicator is already met, to advance beyond the specified indicators(s).
- Those students who have mastered content prior to their presentation find additional sites according to a set of criteria provided by the teacher.
- Those students who struggle with the content can be assigned team partners to with whom to work, through each of the specialist roles.

**Extensions:**
- Have each team select one Website and print its home page.
- Using a red pencil, they select and circle information on the front page that can be identified as fact (something which is known to have happened or to exist, especially something for which proof exists).
- Using a blue pencil, they select and circle information on the front page that can be classified as opinion (a thought or belief about something or someone).

**Homework Options and Home Connections:**
Have students take home a front page (of a Website) to share with a family member. Students should “teach” a family member the method of evaluating the Website. The family member should sign a sheet to validate their participation.

**Interdisciplinary Connections:**

**Science**
**Scientific Inquiry Standard**
**Benchmark:** A. Participate in and apply the processes of scientific investigation to create models and to design, conduct, evaluate and communicate results of these investigations.

**Indicator(s):** 4. Draw conclusions from inquiries based on scientific knowledge and principles, the use of logic and evidence (data) from investigations.

**Social Studies**
**Social Studies Skills and Methods**
**Benchmark:** A. Evaluate the reliability and credibility of sources

**Indicator:** 1. Determine the credibility of sources by considering the following:
- a. The qualifications and reputation of the writer;
- b. Agreement with other credible sources;
- c. Recognition of stereotypes;
- d. Accuracy and consistency of sources;
- e. The circumstances in which the author prepared the source;
Materials and Resources:
The inclusion of a specific resource in any lesson formulated by the Ohio Department of Education should not be interpreted as an endorsement of that particular resource, or any of its contents, by the Ohio Department of Education. The Ohio Department of Education does not endorse any particular resource. The Web addresses listed are for a given site’s main page, therefore, it may be necessary to search within that site to find the specific information required for a given lesson. Please note that information published on the Internet changes over time, therefore the links provided may no longer contain the specific information related to a given lesson. Teachers are advised to preview all sites before using them with students.

For the teacher:  Computer/LCD hook up, overhead projector, transparencies, transparency markers, student resources, all student handouts (Attachments C-F) and printed Web pages if computer access is unavailable and for home connections use

For the student:  Computers, attachments
APPENDIX C

HOME TEAM WEBSITE SPECIALIST HANDOUT
Home Team Website Specialist Handout

Several tools such as books, magazines or newspapers provide research materials.

However, most students are use to the Internet as their first research tool. Internet resources provide a different challenge. With varied fonts, color, animation and audio and video clips, any Web page can look legitimate; any site can persuade viewers of its authenticity.

For this assignment you become a Net detective, or a Specialist. Using the information you gather from your specialist perspective, rank the site, listing its strengths and weaknesses and share them with your team. The team must come to a group consensus after everyone finishes. Be able to support your decisions.

Four Specialist Roles:
1. Content Analysis Specialist;
2. Credibility and Fact-Finding Specialist;
3. Persuasion/Bias Specialist;
4. Layout and Design Specialist.

Your group will look at: (one is circled)
- Cloning Sites 1-4
- Smocking and Tobacco Sites 1-4
- Mental Health Sites 1-4
- Cloning Sites 5-8
- Smoking and Tobacco Sites 5-8
- Mental Health Sites 5-8
APPENDIX D

EVALUATING WEBSITES CHARTS
Evaluator's role: Authority/credibility specialist:

- Who is responsible for this site? Who sponsors it? Hint: truncate each section of the URL back until you are able to find the sponsor.
- What are his/her credentials?
- Have the authors of the site cited their own sources? Are the sources documented appropriately?
- What is the domain name? Does it end in .com, .gov, .edu, .org, .net? Is it a personal page?
- Is that a meaningful clue in evaluating the site? (You can’t always judge a web page by its suffix. Some commercial sites provide solid information. Some university sites offer less-than-serious personal pages to graduate students.)
- Would you include this site in your bibliography?

<table>
<thead>
<tr>
<th>Site name and URL</th>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site #1</td>
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<td>URL</td>
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<td>Site #2</td>
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<td>URL</td>
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<td>Site #3</td>
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<td>Site #4</td>
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<tr>
<td>URL</td>
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</tbody>
</table>
Evaluating Websites Chart

**Evaluator’s role: Bias/purpose specialist:**

- Why was this site created? (to persuade, inform, explain, sell, promote, parody, other?)
- Is it a personal, commercial, government or organization site?
- Is there any bias? Is only one side of the argument presented? Does it appear that any information is purposely omitted? Is there a hidden message? Is it trying to persuade you or change your opinion? Is the bias useful to you in some way?
- Can you distinguish facts from opinion?
- Would you include this site in your bibliography?

<table>
<thead>
<tr>
<th>Site name and URL</th>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site #1___________</td>
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<td>URL_______________</td>
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</tbody>
</table>
Evaluating Websites Chart

Evaluator’s role Content specialist:

- Does the site cover the topic comprehensively? Accurately?
- Can you understand what is being said? Is it written above or below your level of understanding?
- What is unique about this site? Does it offer something others do not?
- Are the links well-chosen? sufficient?
- Currency: Can you tell: the date the information was created? the publication date? the date the material was last revised? Are these dates meaningful in terms of the subject matter?
- Would you get better information in a book? an encyclopedia?
- Would you include this site in your bibliography?

<table>
<thead>
<tr>
<th>Site name and URL</th>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Rank</th>
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<tbody>
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<td>Site #1 __________________________</td>
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<td>URL __________________________</td>
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Name: ________________________________
Evaluating Websites Chart

**Evaluator’s role:** Usability/design Specialist:

- Is the site easy to navigate (user-friendly)?
- Is there a well-labeled contents area?
- Do all the design elements (graphics, art, buttons, etc.) enhance the message of the site? Is there consistency in the basic formats of each page?
- Are there any errors in spelling or grammar?
- Do the pages appear clean, uncluttered?
- Do the links on the site work?
- Would you include this site in your bibliography?

<table>
<thead>
<tr>
<th>Site name and URL</th>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Rank</th>
</tr>
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<tr>
<td>Site #1</td>
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APPENDIX E

WEBSITE
A WebQuest About Evaluating Websites

For 10th grade health class

Adapted from Joyce Valenza: http://mciu.org/~spjyweb/evalwebstu.html

Introduction | Task | Resources | Process | Evaluation | Conclusion

Introduction

If you are like most students, you are relying heavily on resources from the Web for your research. Not all Web resources are created equal. In fact, there are great variations in the quality of the resources you access. The rule of thumb is “when in doubt, doubt.” When you carefully select your resources, when you understand their strengths and limits, you create better products.

The Task

You will be working in groups of four to evaluate a group of Web pages on the topic of tobacco and smoking, mental health or cloning. Each of you will be examining sites from a different perspective. You will be ranking the sites and comparing your rankings with the rest of the class.

Resources

You will each be responsible for completing an evaluation chart, focusing on the perspective you assume within your group.

Your teacher will select four of the following Websites from one of these three controversial areas for you to evaluate:
Cloning sites:

1. *Bioethics and Cloning*  
   http://www.bioethics.net/cloning/cloning.php
2. *Human Cloning Foundation*  
   http://www.humancloning.org/
   http://www.newscientist.com/hottopics/cloning/
4. Cloning is Moral (Ayn Rand Institute)  
   http://www.aynrand.org/site/News2?page=NewsArticle&id=8018
5. Americans to Ban Cloning:  
   http://www.cloninginformation.org/
6. Wikipedia:  
   http://en.wikipedia.org/wiki/Cloning
7. Clonaid:  
8. Human Cloning and Genetic Modification- The Basic Science You Need to Know:  
   http://www.arhp.org/patienteducation/online_brochures/cloning/index.cfm?ID=282

Mental health sites:

1. Health Minds:  
   http://healthyminds.org/
2. Mayo Clinic:  
   http://www.mayoclinic.com/health/mental-health/MH99999
3. Depression:  
   http://www.welatonin.com/
4. Cure Depression:  
   http://www.thinkrightnow.com/
5. Phobia:  
   http://www.jellobung.com/phobia/
6. Social Phobia:  
   http://www.socialphobia.org/
7. Social Phobia:  
   http://seredyn.com/help_social.html?gclid=CK\_y\_0\_\_\_\_4G\_e\_YQCFTqT\_Gq\_\_nGsw\_\_A
8. Social Anxiety:  
   http://www.socialanxiety.com/area-panic.html

Smoking and tobacco sites:

1. American Nonsmokers’ Rights Foundation  
   http://www.no-smoke.org/
2. American Lung Association (Tobacco Control section)  
   http://www.lungusa.org/tobacco/
3. Smoking from all Sides  
   http://www.cs.brown.edu/~ls/h/smoking.html
4. Tobacco Free Initiative (World Health Organization)  
   http://tobacco.who.int/
5. Tobacco Free Kids website  
   http://tobaccofreekids.org/
6. Big Drug’s Nicotine War  
   http://www.forces.org/evidence/pharma/index.htm
7. Phillip Morris Tobacco Company page on Youth Smoking Prevention  
8. Children Opposed to Smoking Tobacco  
   http://www.costkids.org/
The Process

- Your group of 4 students will evaluate the selected Websites.
- Divide your group into the following four specialties to cover ground more efficiently.

### 1. Content specialist:

- Does the site cover the topic comprehensively? Accurately?
- Can you understand what is being said? Is it written above or below your level of understanding?
- What is unique about this site? Does it offer something others do not?
- Are the links well-chosen? sufficient?
- Currency: Can you tell: the date the information was created? the publication date? the date the material was last revised? Are these dates meaningful in terms of the subject matter?
- Would you get better information in a book? an encyclopedia?
- Would you include this site in your bibliography?

### 2. Authority/Credibility specialist:

- Who is responsible for this site? Who sponsors it? Hint: truncate each section of the URL back until you are able to find the sponsor.
- What are his/her credentials?
- Have the authors of the site cited their own sources? Are the sources documented appropriately?
- What is the domain name? Does it end in .com, .gov, .edu, .org, .net? Is it a personal page?
  - Is that a meaningful clue in evaluating the site? (You can’t always judge a web page by its suffix. Some commercial sites provide solid information. Some university sites offer less-than-serious personal pages to graduate students.)
- Who else links to the site? (You can perform a link check in AltaVista or Google by entering “link:webaddress” in the search box. Is it linked to by reliable sites? What do other sites say about this one?
- Would you include this site in your bibliography?

### 3. Bias/purpose specialist:

- Why was this site created? (to persuade, inform, explain, sell, promote, parody, other?)
- Is it a personal, commercial, government or organization site?
- Is there any bias? Is only one side of the argument presented? Does it appear that any information is purposely omitted? Is there a hidden message? Is it trying to persuade you or change your opinion? Is the bias useful to you in some way?
- Can you distinguish facts from opinion?
- Would you include this site in your bibliography?

### 4. Usability/design specialist

- Is the site easy to navigate (user-friendly)?
- Is there a well-labeled contents area?
- Do all the design elements (graphics, art, buttons, etc.) enhance the message of the site? Is there consistency in the basic formats of each page?
- Are there any errors in spelling or grammar?
- Do the pages appear clean, uncluttered?
- Do the links on the site work?
- Would you include this site in your bibliography?
• Each student in the group should complete his/her own organizer through the perspective they are assigned.
• As you examine each site, record any relevant information in your chart/organizer. Begin to rank the sites 1 through 4, with 1 being the best. It may be easier to think to yourself, “Which are the two best sites in the set; which are the two worst.”
• Each group should select a recorder to take notes on group discussion and a discussion leader, whose job it will be to make sure each member gets a chance to contribute and to lead the group toward reaching a consensus about the best and worst sites.
• Be prepared to discuss/compare your group’s findings and rankings with the rest of the class during the class discussion period.

**Evaluation**

You will be evaluated on your group work, your completed organizer, and your participation in large group discussion using this rubric. Make sure your group is able to defend its choices in the discussion ranking the sites.

**Conclusion**

You will find yourself using the Internet for information. The Internet is only one of a variety of information options. Remember that journals, books, videos and other sources are available as well. Evaluating information is a skill you will be using throughout your lifetime.
APPENDIX F

EVALUATING SITES TASK ASSESSMENT FORM
# Evaluating Sites Task Assessment Form

## Rubric for Evaluating Websites WebQuest

Student /Student Group_____________________________ ________________________  

Evaluator(s): ____Peer ____Teacher ____Self

<table>
<thead>
<tr>
<th>Standards</th>
<th>Evaluation/Comments</th>
</tr>
</thead>
</table>
| Student(s) worked effectively as a group to divide tasks and reach consensus. | 1........2........3........4........5........  
| Comments:                                                                 |                     |
| Students(s) understood their roles as evaluators and their focused perspective is clear in their organizer(s). | 1........2........3........4........5........  
| Comments:                                                                 |                     |
| Organizer was completed with accurate and relevant information. Student(s) displayed critical thought in examining the Websites. | 1........2........3........4........5........  
| Comments:                                                                 |                     |
| Members of the group were involved in the discussion and defended their rankings of the Websites. | 1........2........3........4........5........  
| Comments:                                                                 |                     |

Valenza/99
APPENDIX G

NINTH GRADE LESSON PLAN
Lesson Summary:

This lesson is a research skills introduction/review for ninth grade students who are currently enrolled in freshman seminar, a ninth grade study skills course.

Estimated Duration:

This lesson will be concluded in a 90-minute block class.

Commentary: Freshman seminar is a course that every ninth grader must take. The goal is to provide a foundation in research skills for every student entering high school.

Pre-Assessment:

A week before the scheduled time the classroom teacher will pass out a checklist questionnaire to the class to aid library media specialist in how much review of research skills is necessary.

Scoring Guidelines:

Questionnaire will reveal whether or not student has met the indicator or benchmark so that instruction can be modified and targeted to learners accordingly.

Post-Assessment:

Scores the students earn on their min-report should reveal whether instruction was adequate. The results should help to plan subsequent instruction.

Scoring Guidelines:

Rubric-see attached
including research that provides a clear and accurate perspective on the subject.

**Instructional Procedures:**

Each student will be given a guideline to researching including MLA citations, hints on note taking and criteria on evaluating a source. Instruction will be given on logging onto the Internet, navigating in INFOhio and finding a periodical article. The student will choose an article, read it, evaluate it, and write a five-paragraph summary on it.

**Differentiated Instructional Support**

Articles at an appropriate reading level will be printed ahead of time to accommodate students with identified reading problems.

**Extension**

This class will be the foundation for the many research papers the student will have to write in high school.

**Homework Options and Home Connections**

Class time will be given to complete the assignment. For those unable to, they may turn it in the next day.

**Interdisciplinary Connections**

A list of topics that are pertinent to their academic subjects will be given to students to choose from.

**Materials and Resources:**

*For teachers*
- Completed pre assessment forms.

*For students*
- Research guideline paper
- Internet
- INFOhio bookmark
Research Using Print Resources

The correct MLA citation for my article is:

________________________.  ________________________ _____.  ___________________________.  ____________:   _________.

Author-Last name first name.    Title of article (“quotation marks”).      Title of magazine (underlined).               Date:             Pages.

Example: Toppo, Greg. “School violence hits lower grades”, USA Today. 13 January: P.1
When using the Web, check the

**F** How did you **FIND** the page?
- Did you find the site using a good search phrase on a search engine?
- Did you avoid using sites that are linked to each other? They may have the same or very similar information? Remember that almost anyone can publish on the web.

**A** Who is the **AUTHOR**? Is the information **ACCURATE**?
- Is the author clearly identified? What are the author’s credentials for writing on the subject? Is the author associated with a group, association, or academic institution?
- Is the information reliable and error free? No spelling, grammar, or typing errors? Is the same information found on at least two other unrelated sites or from two other unrelated print resources?

**C** Can you **CONTACT** the author? Is the web site **CURRENT**? Is the topic well **COVERED**?
- Can you contact the author or association? Is there an email address?
- Is the web site CURRENT? Is the content of the work up-to-date?
- Is the publication date clearly indicated? Be clear whether to date is when the site was first created, placed on the web or last revised.

**S** Does the information make **SENSE**?
- Is the information presented with a minimum of bias? The Web often functions as a “virtual soapbox”.
- To what extent is the information trying to sway the opinion of the audience? The goals/aims of persons or groups presenting material are often not clearly stated.
- Is the information logical and consistent with what you already know?

(Adapted from Carol Schwartz: “Can You Believe It” Evaluating Web Sources

http://www.libertycenter.k12.oh.us/schwartz/DocLinks/FACS%20Checklist.PDF)
APPENDIX H

ANALYSIS OF VARIANCE FOR GPA WITH OUTLIER ELIMINATED
### Descriptives

**Grade Point Average**

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<th></th>
<th>N</th>
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<th>Std. Deviation</th>
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### Analysis of Variance for Grade Point Average

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APPENDIX I

ANALYSIS OF VARIANCE FOR WEB EVALUATION SCORES
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*Note. * $p < .05$
APPENDIX J

MULIPLE COMPARISONS SCHEFFE OF TEACHER SCAFFOLDED (TS), WEB SCAFFOLDED (WS), AND NONSCAFFOLDED GROUPS
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* The mean difference is significant at the .05 level
REFERENCES
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Paper presented at the Third International Forum on Research in School Library media specialistship, Birmingham, AL.


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