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**CAN COMPUTER TECHNOLOGY HELP ELEMENTARY STUDENTS
ACHIEVE INFORMATION LITERACY?**

by
David Calvanico

A Thesis

Submitted in partial fulfillment of the requirements of the
Master of Arts Degree
of
The Graduate School
at
Rowan University
(May 2, 2000)

Approved by _____

Date Approved May 13, 2000

Abstract

David W. Calvanico. Can Computer Technology Help Elementary Students Achieve Information Literacy? 2000. (Under the direction of Dr. Holly G. Willett, Program in School and Public Librarianship).

In an attempt to determine if computer technology helps elementary students achieve information literacy, a quasi-experiment was conducted using the Solomon four-group design with two fourth grade and two fifth grade classes. Information Literacy Standards from *Information Power: Building Partnerships for Learning* and Eisenberg and Berkowitz' Big 6™ Information Literacy model were used to structure the experiment. The researcher was a participant observer, the school's librarian. Two classes were pretested and posttested, the other two were only posttested following Solomon four-group protocol. The researcher used a rubric to assess students at each step of the Big 6™ Information Literacy model in the course of their information problem-solving search. The scores from the pre- and posttests were not conclusive in themselves. While one class demonstrated improvement on its posttest scores, all the classes' posttest scores were within a few percentage points of each other. Likewise, the Rubric for Assessment determined the four groups to be "adequate" or slightly better at each of the Big6 steps. The role of the teacher-librarian was also studied and found to be crucial. Continuing study of teacher-librarian roles is recommended as computer technology advances and its use continues to increase in education.

Mini-abstract

David W. Calvanico. Can Computer Technology Help Elementary Students Achieve Information Literacy? 2000. (Under the direction of Dr. Holly G. Willett, Program in School and Public Librarianship).

A quasi-experiment was conducted using the Solomon four-group design to determine if computer technology helps elementary students achieve information literacy. The results from testing and observation were inconclusive. Continuing research is encouraged in order to evaluate changing technologies, the role of the teacher-librarian, and their effects on children's education.

Acknowledgements

“Now to him who is able to do immeasurably more than all we ask or imagine...”
(Ephesians 3:20 NIV, The Bible).

I want to acknowledge God’s help throughout this entire project. I also wish to thank God for the following people he has placed in my life:

I am thankful for my loving wife, Marjorie, who has supported and encouraged me throughout the writing of this thesis; indeed, my entire graduate program.

I am thankful for the faculty and staff at The King’s Christian School. Mrs. Troutman, the principal, has shown such support for this project. Thanks to Mrs. Coffey, Mrs. Cronk, Mrs. Entwistle, Miss Farris, and Mrs. Toyer, the teachers who collaborated and cooperated with me in this project. And, special thanks to the eighty-six students who worked so hard at something so new to them.

I am thankful for Dr. Holly Willett who so thoroughly taught and patiently guided me to the conclusion of this thesis.

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Chapter One

The Problem

Introduction and Background

School library media centers at the turn of the millenium are dynamic academic hubs of activity—or should be. With new technologies being introduced faster than we can keep up with and new formalized Information Literacy Standards for Student Learning (American Association of School Librarians [AASL] and Association for Educational Communications and Technology [AECT], 1998) being adopted in schools across the nation, further examination of the relationship between technology and information literacy seems timely. For this research, the following questions were central to the study: Can computer technology help elementary school students achieve information literacy? And, what is the role of the school library media specialist in students' achievement?

Murray (1999) addresses the question of technology and the role of the school librarian stating, "As electronic access to information proliferates in junior and senior high schools, librarians can model the adventure of lifelong learning by teaching faculty and students how to search the Internet for pertinent information, evaluate the reliability of information retrieved, analyze and synthesize the information to construct personal meaning, and apply it to informed decision-making" (p. 10). The same should be true for elementary schools as well. Baule (1998), in his review of *Information Power*:

Building Partnerships for Learning, looks back to an earlier edition of *Information Power* (1988) which states that the mission of the library media program “aims to ‘ensure that students and staff are effective users of ideas and information’” (p.2). That mission remains the same. *Information Power: Building Partnerships for Learning* (1998) begins chapter one with the statement, “Information literacy—the ability to find and use information—is the keystone of lifelong learning” (p. 1). Lifelong learning is a major goal of education, and information literacy is a vital component of achieving that goal.

Information Power lists nine Information Literacy Standards for Student Learning. The focus of this study was on the first section that lists the following three standards:

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. (AASL & AECT, 1998, p. 8)

Heaston and Bedell (1998) have addressed the use of technology. They ask, “How will technology be used by today’s students to meet future needs?” The question was answered in terms of the role of the library media specialist. First, the library media specialist must be aware of the learning goals and objectives of the school’s curriculum to be attained. Next, learning opportunities must be planned to incorporate the effective use of computers, a tool in helping students achieve information literacy. Finally, this must be done in the context of the school’s academic curriculum.

When Doug Johnson (1999), director of media and technology at Mankato Area Public Schools in Minnesota, had to create an information literacy curriculum for his

school district, he faced the challenge of creating a curriculum that utilized the newest computer and online technology. After three years of development and implementation, it is apparent that the use of computers is an integral part of the Mankato district's information literacy curriculum. Computer technology, in this context, appears to have the potential to help students achieve information literacy. No follow-up studies are indicated to verify this, however.

The goal of this research was to ascertain the effectiveness of computers in helping elementary students achieve information literacy. Consideration was also given to opposing viewpoints in the literature, which, at the very least, voice caution and concern about the misuse of computers with younger students.

Statement of the Problem

The question of how computer technology can be an effective tool in helping students achieve information literacy is important in that it has the potential to impact the total school curriculum. Conversely, the school's curriculum also has the potential to impact how computer technology is implemented. As the school's curriculum changes, it impacts how information literacy is integrated into the learning process as well as how technology is used. With the integration of three factors, 1) the school curriculum, 2) information literacy standards, and 3) the effective use of computers, the potential for computer technology to help students achieve would seem a given. However, there are caveats expressed by some that warrant attention. For example, Healy (1998) begins her book, *Failure to Connect: How Computers Affect Our Children's Minds—for Better and Worse*, with the following:

Technology shapes the growing mind. The younger the mind, the more malleable it is. The younger the technology, the more unproven it is. We enthusiastically expose our youngsters to new digital teachers and playmates, but we also express concern about the development of their brains, bodies, and spirits. Shouldn't we consider carefully the potential—and irrevocable—effects of this new electronic interface with childhood? (p. 17)

Healy also addresses the future needs of students in an article entitled, “Why Slow Down the Rush toward School Computers?” She states, “As software design improves, computers will doubtless help with [preparation for students’ future use of technology], *but the key will continue to lie in the quality of the teachers who plan, mediate, and interpret a thoughtful curriculum* [italics added]” (p. 37). Please note that she emphasizes the quality of the teacher.

Thorpe (1999) sounds a similar warning.

As people in schools advocate for increased investment in computer technology and prepare to measure the impact of these technologies on student learning, their work should begin with the understanding that *it is the shift in teacher practice* [italics added] and the attendant shift in the basic culture of school—and not the technology itself—that will bring about the gains in student performance. (p. 48)

Note again the emphasis on the teacher, not technology, which he believes will help students achieve. The question of the role of the library media specialist, especially as a teacher, is an important consideration in students achieving information literacy standards.

Objectives of the Research

There were three main objectives of this research. First, to discover whether or not computer technology could indeed help students achieve information literacy standards. Secondly, if it did, to identify factors, such as the library media specialist, that made computer technology effective at the elementary school level. Finally, to observe if

any drawbacks were present in the study as warned about in the literature. For example, students may access large amounts of information but may lack understanding of what they have accessed. This can be especially true of students using the Internet without critically thinking about and evaluating the information being accessed. The findings of this research are intended to be of assistance to library media specialists who are developing an information literacy curriculum and integrating the effective use of computer technology in its implementation with students at the elementary school level. The findings may also be helpful in the preparation of lessons or units by the library media specialist conducive to teaching information literacy skills.

Conceptual Framework

In January 1984, the U.S. National Commission on Libraries and Information Science unanimously adopted a statement emphasizing “the importance of the role of library and information resources to underpin all of learning and... the essential skills and proficiencies involved in finding and using information effectively” (Hashim, 1986, p. 17). It further recognized “that effective participation in our ‘learning society’ requires each person to be able to manage complex information in electronic and digital form...” (p. 17). Whose role it is to ensure that everyone be able to accomplish this is not specifically recommended, although it is later suggested that it should be a collaborative effort between teachers and librarians. Ideally, a child’s education is more meaningful if all the separate components of the school’s curriculum are integrated so that the child’s learning is more authentic. This is more likely to motivate a child to engage in lifelong learning.

As information literacy standards for student learning continue to be widely accepted in schools, and the use of computer technology continues to increase, it is important to evaluate the use of computers to see if indeed they are actually helping students achieve as we wish to believe they are.

The variables considered in this study were the students and the information literacy standards and the role of the LMS. The independent variable introduced in the research was the use of computer technology. As for the students, answers to the following questions were explored: Did they know how and where to access information efficiently and effectively? Did they know how to evaluate information critically and competently? Did they know how to use information accurately and creatively? With regard to information literacy skills, it was necessary to determine at what level of skill the students were achieving, and which skill was most aided by the use of computer technology. The independent variable of computer technology was examined along with the various roles played by the LMS throughout the students' learning process.

To search for an answer to the question of technology helping students achieve information literacy, evaluation research was utilized using the "Solomon four-group design" (Babbie, 1998, p. 244) in which four groups of subjects were used as variables. Two fourth-grade classes and two fifth-grade classes were used to make up the four groups. The students were aware that they were taking part in this research. Group 1 was pretested, had full instruction and use of the technology, i.e. computer, the Internet, etc., in the library to accomplish a unit of study, then posttested. Group 2 was also pretested and posttested, but did not have use of computer technology. Instead, they used print media only. Group 3 was instructed similarly to Group 1 except that they were not

pretested. Group 4 was instructed similarly to Group 2 except for pretesting. The benefit of no pretesting with groups 3 and 4 was that it ruled out interactions between testing and the stimulus, the introduction of the use of computers.

Since the researcher was the teacher-librarian in the study, the aspect of “participant observation” (Babbie, 1998, p. 286), a part of field research, was present. That is, while observing the behaviors of the students, the researcher also participated in the study as a teacher-librarian. It is inevitable that he had some effect on the results of the study but every effort was made to minimize any influence on the outcome of the research. Collaboration with teachers took place for the purpose of doing the research in the context of classroom instruction.

It is understood that “field research more typically yields *qualitative* data: observations not easily reduced to numbers” (Babbie, 1998, p. 280). Babbie says that this is a challenge in evaluation research. He states, “There’s the common rub in evaluation research: measuring the ‘unmeasurable.’ Evaluation research is a matter of finding out whether something is there or not there, whether something happened or didn’t happen” (p. 336). The challenge of this research was to create operational measures to determine if the use of computers really did have a positive influence on students’ achievement. A rubric was designed to help evaluate the information literacy process and the product that resulted from that process for each student.

Questions

The hypothesis being considered was that computer technology can be an effective tool in helping elementary school students achieve information literacy.

Furthermore, the effectiveness of computer technology is enhanced when the library media specialist is actively involved in the learning process. Questions that were considered included: 1) Which group of students, out of the four groups, demonstrated the greatest measurement of achievement? Can it be determined why? 2) Which information literacy standards did the students achieve best? ... least? 3) Were there observable explanations for the various levels of achievement? 4) Which computer technologies, e.g. the Internet, CD-ROM databases, etc. were most used by students that might explain any particular levels of achievement? 5) What was the role of the library media specialist in the use of technology and any achievement of students in information literacy?

In finding answers to these questions, and others, it was hoped that the results would be helpful in curriculum development at the elementary school in which information literacy and computer technology are being integrated into the total curriculum of the school.

Definition of Terms

Achieve. Students were determined to have achieved if they were able to accomplish a given assignment demonstrating the ability to independently access, evaluate, and use information. A rubric against which each student was evaluated determined their level of achievement for information literacy skills.

Computer technology. In this study, anything that has to do with the use of computers in a school setting, such as the hardware, the software, as well as online retrieval of information via the Internet was considered computer technology. Of

particular interest is the use of the computer in the accession and evaluation of information and the creative expression of new knowledge from the gathering of information. As for evaluation of the information accessed, the quantity vs. the quality of information was of great interest, especially as it relates to information gathered from the Internet.

Elementary school students. In this research, fourth and fifth grade students were the subjects being studied. When references are made to other studies that refer to students, any modification of this definition will be noted as necessary.

Information literacy. This term comes from standards listed in *Information Power: Building Partnerships for Learning*. Nine standards are discussed at length; however, this research limited itself to the first three standards. In brief, they cover 1) the access of information efficiently and effectively, 2) evaluation of information critically and competently, and 3) use of information accurately and creatively (AASL and AECT, 1998). Eisenberg and Berkowitz's Big 6™ Information Literacy Model (Johnson, 1996, p. 9) organizes these standards in six steps for students to use in solving information problems. The six steps are 1) task definition; 2) information seeking strategies; 3) location and access; 4) use of information; 5) synthesis; and 6) evaluation.

Library media specialist. In this study, a library media specialist is the professional employee in a school library who is employed as librarian and is a certified teacher. At the elementary level, it is safe to assume that the library media specialist spends a good deal of time teaching library skills to students. It is anticipated that how well students achieve in learning and demonstrating information literacy will depend on the instruction they receive by the library media specialist about the use of computers.

Organization of remainder of the study

Chapter Two is a comprehensive review of the literature and will reveal the divergence of thought about the use of computer technology in elementary schools. While some anticipate the great possibilities of computers in schools, others voice concern and caution about how it is being used and by whom. Inferences and conclusions will be noted specifically about how technology might help students achieve information literacy skills. Chapter Three describes this particular study—its design, methodology, data collection and other procedures, and the plan of analyzing the data. Chapter Four presents the analysis of the data followed by Chapter Five, which summarizes the study, draws conclusions, and makes recommendations for future study.

As stated earlier, it is hoped that this study might serve as a guide for the effective use of computer technology in lesson preparation, instruction, and evaluation. Furthermore, it is hoped that this information might be useful in the creation of new curricula or revision of existing curricula, whether it is an information literacy curriculum, a technology curriculum, or preferably, the integration of both into one. A curriculum that combines information literacy and computer technology and is taught by the library media specialist in collaboration with classroom teachers might best help students achieve information literacy standards.

Chapter Two

The Literature Review

Introduction

The literature has much to say about information literacy. Much has also been written about computer literacy, although there does not seem to be consensus about what computer literacy is. When it comes to the discussion of the benefits of computers helping students achieve information literacy, the literature reveals a range of thinking. While most of the research seems to indicate that computers can be beneficial if used appropriately, there are others who pose some thoughtful, challenging questions about how computers are currently being used. These issues will be explored throughout this chapter.

The role of the library media specialist (LMS) and the use of computers to achieve information literacy will also be considered. The LMS's role continues to evolve from that of one who organizes and manages a library to one who also has a central role in technology planning and implementation of technology in the school curriculum (Johnson and Eisenberg, 1996). A close look at the literature reveals various roles of the LMS that help maximize student achievement of information literacy.

To summarize, in this chapter a look will be taken at the historical context of information literacy, the use of computers to help students achieve information literacy, and the role of the LMS. An assessment of previous studies and current thought will be

discussed. Justification for this research and study will be offered as well as a discussion of the research design and methodology used in previous research, which will influence the design of this research. Finally, a theoretical framework for this study will be considered.

Historical Context

Computers have been used in education since the late 1950s. But it was the 1960s that began to bring computer-assisted instruction (CAI) into the mainstream of education. This early use of computers was designed to help students acquire basic skills, practice and drill of basic skills, and then measure learning gains. It wasn't until the 1980s that the use of computers broadened using word processors, spreadsheets, and distance learning. In the 1990s, the use of computers in education skyrocketed. Students and teachers used multimedia educational software, accessed information from the Internet, and used e-mail for many purposes, thus potentially making the process of learning richer (Department of Education, 1996).

The growth in the number of computers used in schools could be described as phenomenal. According to a report by the Department of Education (1996), there was one computer for every five students in 4% of schools in the United States in 1996. Compare that to just a few years earlier, 1992, when there was only one computer for every 13 students (Burnett, 1994). Or, to look at the numbers in a different way, in the mid-1980s, there were approximately 50,000 computers in schools compared to over 2.4 million in 1990 (Hecht and Roberts, 1996). Just a few years later, in 1994, Burnett (1994) claims 3.5 million computers in schools. As of 1998, the total number of

computers in schools has increased to over 8 million (U.S. Bureau of the Census, 1998). There is no reason to doubt that this trend will continue as schools perceive a need to increase the number of computers and ways to effectively use computer technology in the classroom.

As important as the existence of computers in schools is, how they are being used is even more important, especially in the area of information literacy, since information literacy has the potential to impact every part of a school's curriculum. The term, information literacy, was first used in 1974 in a proposal to the National Commission of Libraries and Information Science (NCLIS), that called for a national program to achieve information literacy by 1984. According to Kuhlthau, "The proposal characterized 'information literates' as those who 'have learned techniques and skills for utilizing the wide range of information tools as well as primary sources in molding information-solutions to their problems' (Zurkowski, 1974)" (1987, p. 24). The NCLIS adopted a statement in January 1984 which emphasized "the importance of the role of library and information resources to underpin all of learning and ... the essential skills and proficiencies involved in finding and using information effectively" (Hashim, 1986, p. 17). Hashim refined the concept further by succinctly stating, "A basic objective is for each student to learn how to identify needed information, locate and organize it, and present it in a clear and persuasive manner" (Hashim, 1986, p. 17). In 1987, Kuhlthau advanced the idea of combining library skills and computer skills in the definition. This concept paved the way for developing the idea of integrating information literacy skills with school curricula.

In 1988, *Information Power*, published by the American Association of School Librarians (AASL), stated its mission: “To ensure that students and staff are effective users of ideas and information.” This mission is accomplished by:

- Providing intellectual and physical access to materials in all formats;
- Providing instruction to foster competence and stimulate interest in reading, viewing and using information and ideas; and
- Working with other educators to design learning strategies to meet the needs of individual students. (AASL, 1988)

In 1989, the National Forum in Information Literacy (NFIL), “a coalition of over 60 organizations from business, government and education, all sharing an interest in and a concern for information literacy,” developed the concept further. The Forum concluded that information literacy must be used in the context of existing practice to be successful (Doyle, 1995, p. 3).

In 1991, the Secretary’s Committee on Achieving Necessary Skills (SCANS) recognized the economic shift in American society toward information services and made a recommendation for skills foundations required for all Americans, which included:

1. Basic skills, such as communication and understanding in reading, writing and speaking;
2. Thinking skills, such as problem solving, knowing how to learn, the generation of new ideas, setting goals and choosing best alternatives; and
3. Personal qualities, such as responsibility, self-esteem, sociability, self-management, integrity and honesty (SCANS, 1991, p. xviii). (Doyle, 1995, p. 3)

Doyle notes the close relationship between the SCANS recommendation and the full definition of information literacy—the ability to access, evaluate and use information from a variety of sources—and how “this provides a powerful argument for advancing

the concept of information literacy (p. 3). This same concept of information literacy was further advanced in 1994 when “President Clinton signed legislation authorizing goals 2000, giving the national education goals legal status” (Doyle, 1995, p. 4).

Finally, in 1998, AASL in partnership with the AECT, both being branches of the American Library Association (ALA), published *Information Power: Building Partnerships for Learning* in which nine information literacy standards for student learning are listed and extensively discussed. Only the first three standards are listed here since they were the focus of this research.

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. (AASL and AECT, 1998, p. 8)

While the concept of information literacy is widely accepted among educators, how to fully implement it in the context of the school curriculum remains a challenge. LMSs are facing this challenge and the issue of how to use computer technology effectively to achieve these standards.

“Over the past ten years,” according to Johnson and Eisenberg (1996), “the profession has made significant progress in accepting an important role in the educational technology arena.” They believe that teacher-librarians must now also “begin providing the knowledge, vision and leadership to the critical area of computer instruction” (p. 2), although they admit there is not a clear notion of what computer literacy means. There is much in the literature to suggest that the role of the LMS continues to change, and will continue to do so in the future, largely because of the rapidly changing world of

technology and how it used to store information and the ability of users to access information.

Assessment of Previous Studies

The historical development of the concept of information literacy and the growing use of computers in education demonstrate the importance of these issues in today's school libraries. It has been largely during the current decade that these two ideas, information literacy and computer literacy, have come together so extensively, sometimes successfully and sometimes not. Are there real benefits to adding computers to the curriculum? According to Hecht and Roberts (1996), it is hard to say. Technology changes so quickly, and scholarly communication tends to be so slow that any timely dissemination of information from research would make it obsolete by the time it is in the hands of interested parties. "Large variations in the kinds of the research completed, and the ways in which computers are used ..., make reproducing an effort, and therefore generalizations from that research, difficult" (Hecht and Roberts, 1996, p. 2). Similarly, Healy (1998) quotes Edward Miller, the former editor of *Harvard Education Letter*: "The research is set up in way to find benefits that aren't really there. Most knowledgeable people agree that most of the research isn't valid.... Essentially, it's just worthless" (p. 19). Be that as it may, the literature does cite some studies worth looking at.

Hecht and Roberts (1996) conducted research during the 1993-94 school year, similar to the current research being proposed. It was a quasi-experimental effort that sought to describe the interaction between computer technology and team teaching. They studied ninth-grade students' academic achievement in each of four different subject

areas: algebra, biology, world cultures, and English. Two treatments were studied. One group received the teacher-teamed approach only. A second group received the teacher-teamed approach combined with “significantly improved access to computer and telecommunications technology, both at school and at home” (p. 3). A third group served as a control group receiving no special accommodations for team teaching or technology access. The groups represented equal proportions of male and female students. All three were ethnically equivalent. Although there were some differences in criterion-referenced test (CRT) scores in the subject areas taken before the study, “it was felt that these differences ... were small enough in magnitude to allow for their accounting as covariates in later analyses” (Hecht and Roberts, 1996, p. 4). The research was conducted from August 1993 through June 1994. The results of their research indicated that the students who were exposed only to the teacher-teamed approach outperformed the other two groups in almost every subject at almost every grading period. These same students maintained a statistically significantly higher overall GPA than the other students, as well. Possible explanations for this are indicated in interviews conducted after the research period. The teachers who were responsible for using technology in combination with the teacher-teamed approach expressed concern “that their use of the computer required a redirection of classroom time away from the traditional curriculum in order for the students to master and integrate the technology.” These same teachers

consistently reported the difficulty of having to integrate new computer technology into an otherwise full curriculum. Furthermore, because the district’s CRT reflected technology as an addition to what was perceived as an already full Project Homeroom [the name given the group with the combined team teaching and computer technology], teachers were forced to make a difficult choice between teaching for and with the technology or teaching with the standard curriculum for the CRT. (Hecht and Roberts, 1996, p.7)

Another factor to consider might be the personal and professional attributes of the teacher teams and how the dynamics of teaching styles and personalities might have affected the results. This is not directly discussed in the study, but the comments of the teachers quoted above might indicate a potential problem.

Hecht and Roberts (1996) draw the conclusion that “computer technology [needs] to become an inclusive part of regular instruction and assessment, rather than an added feature, if students and teachers are to consider it of value” (p. 7).

The research intended for this study focused on fourth and fifth grade elementary students. Research done in elementary school settings is scarce. However, Jane Healy, in her book, *Failure to Connect: How Computers Affect Our Children’s Minds—for Better and Worse*, reports on her research of the use of computers in schools, many of them elementary. She describes many first hand accounts of what she observed with the use of computers. She also interviewed leaders in the field and researched both off- and on-line. She claims that educators are placing a lot of faith in computers, so much so that there is a growing demand for evidence of its worth. She cautions educators eager to use new and emerging technologies to consider if anything educationally is indeed really being accomplished. If not, how can we make the necessary changes? Despite the reservations by Healy and those she quotes in her book, she is not against the use of computer technology in education. She asks, “Can technology contribute to learning?” Her response is, “I think it can ... *if* parenting and teaching retain priority ... *if* the technology complements a well-planned curriculum ... *if* parents and teachers are willing to provide a human ‘scaffold’ for technology-assisted learning ... then young people may

profit from wise choices in this emerging field” (Healy, 1998, p. 245-246). This seems to be the conclusion many are reaching.

This, then, brings the discussion around to the role of the LMS. Brock (1994) did a study “aimed at formulating a library literature-based model for developing information literacy through the information intermediary process” (Abstract, p. 1). *Information Power* (1988) charges teacher-librarians with the responsibility for helping library users become information literate. Brock refers to teacher-librarians as “information intermediaries—professionals who help students ... with the information explosion... (American Association of School Librarians & Association for Educational Communications and Technology, 1988, p. 15)” (Brock, 1994, p. 1). Part of Brock’s research was to study what teacher-librarians do as they help students involved in the process of information search and use (ISU). She developed her model based on data collected in the literature. A list was made of specific skills used by students in the ISU process. She further identified strategies used by teacher-librarians working with students. She then surveyed contributors to the literature on which the model was based. The result was an “Information Intermediary Process Model” which included the generic ISU process with a three-phase instructional model—instructing, coaching and facilitating. She concluded that “teacher-librarians do help students define information-based problems; develop information-seeking strategies; locate information; gather and assess information; synthesize information; and present, evaluate and refine results” (Brock, 1994, p.3). Brock’s study emphasizes the importance of the role of the LMS in students’ achieving information literacy. LMSs are instructors, collaborators with other teachers, and facilitators in the use of computer technology. One of the implications

Brock makes at the conclusion of her study is that “there is a need for constant reexamination of the teacher-librarian role”, especially in a technologically rapidly changing educational environment (Brock, 1994, p. 4).

Justification of the Selection of the Topic

The Department of Education (1996) reports statistics from the Public Agenda Foundation which reports that 80% of Americans believe teaching computer skills is “absolutely essential.” The same Department of Education report cites an Intelliquest survey that claims 75% “have encouraged a child to use a computer, and 86% believe that a computer is the most beneficial and effective product they could buy to expand their children’s opportunities” (Department of Education, 1996, p. 12). It is safe to assume that if the same survey were done today, the percentages would be even higher since the demand for computers has continued to grow in education and elsewhere.

Todd (1995) asserts that “school library media programs are increasingly based on the assumptions that information skills instruction is a valuable and essential part of the school’s educational program; ... and that the teaching of these skills can be enhanced by the use of innovative instructional methods” (p. 133). It has been suggested elsewhere that the integration of computer technology in teaching and learning situations will help improve education (Hecht and Roberts, 1996). Burnett (1994) elaborates a bit more on the idea of integrating information literacy and computer technology. He believes that students have much to gain—or lose—depending on how schools implement educational technology programs. Educators must decide what kind of program they will use and also be prepared to determine the place that technology will occupy within their schools.

Tastad and Tallman (1997) discuss how libraries of the future will be learning-centered libraries in which students demonstrate the characteristics of information literacy. They go on to say that National Library Power programs emphasize that library media specialists [should] integrate information literacy skills throughout the curriculum (p. 2-3). The literature, in general, seems to indicate that technology alone will not result in improved student achievement, but a combination of LMS (and teacher) instruction and technology has the greatest potential to demonstrate gains in student achievement *if* the technology is used appropriately.

The use of computers in education to help students achieve continues to be a timely topic. Another quick look at the historical perspective indicates that issues dealt with twenty to thirty years ago are still being dealt with today. Grimes (1977) reflects that “in the early days” there was tension between the computer experts who were excited about the use of computers in education and the teachers who were sold curriculum materials but had little or no knowledge of how to use the technology. While gains have been made in winning teachers over through the use of technology workshops, seminars, and college courses, there remains, at times, an adversarial tension between the computer experts and educators. There are still many schools and school districts that do not provide appropriate training for faculty and staff in the use of computers. Teachers need to be comfortable in computer skills as well as the vocabulary required to effectively implement computers in the curriculum. In the early days there was the fear that computers would replace teachers. Again, the more recent literature indicates that a successful partnership between computers and teachers has the potential to be superior to either variable used alone. And until educators learn how to effectively integrate

computer technology into the curriculum, the tension of competing priorities, e.g. time and money, will continue to exist.

These issues of computer technology, and more, have been with educators for over three decades now. Advances are being made, but consistent, solid research is still needed so that educators will be able to learn more about how to most effectively use computer technology to help students achieve.

To summarize, computer technology is an integral part of our lives, and indeed, becoming more and more a part of school life. Since we are becoming an information dominated society, information literacy skills will become more and more important for everyone. Computer technology has the potential to enhance student achievement of information literacy skills. Who better to be a part of bringing together computer technology and students' achievement of information literacy than library media specialists? Their role in schools is becoming more central as they become involved in curriculum development and collaborative efforts with classroom teachers in working with students.

Selection of the research design and methodology

For purposes of this research, the Solomon four-group design was used to study four classes—two fourth grade and two fifth grade—during weekly regularly scheduled library classes. The experimental stimulus, computer technology, was introduced to two classes only, while the other two classes—control groups—used only traditional print media. The benefit of the Solomon four-group design was that it “rule[d] out interactions between testing and the stimulus...” (Babbie, 1998, p. 244). It was possible that the

pretests might have influenced the students in groups one and two, but it should not have occurred in groups three and four because of the absence of pretesting.

In the study conducted by Hecht and Roberts (1996), three groups were used. All students were pretested, but no reflections were made by the researchers as to whether pretesting had any affect on their study. This study also differs from the current research in that different teams of teachers were used throughout their study. In this study, the researcher was the sole teacher-librarian working in collaboration with four separate classroom teachers and four separate classes.

A rubric was designed for this research for the purpose of assessing the students' final product as well as the process used to produce the product. Farmer (1997) discusses "authentic assessment of information literacy through electronic products." She uses a model by McTighe, which categorizes assessment items as product, performance, and process. "The assessment task itself should have these characteristics:

- Multidimensional and complex in nature
- Incorporate modalities of learning
- Demonstrate progress of time
- Learn with practice rather than base on native talent
- Build on practice and feedback
- Align with school outcomes and goals" (Farmer, 1997, p.3).

The rubric developed for this research was based on Eisenberg and Johnson's Big 6™ Information Literacy Skills (1996). This rubric enabled the researcher to be more objective in making subjective assessment of the process used to complete a project that demonstrated each student's level of information literacy achievement.

Assessment is not a one-time occurrence but rather an ongoing activity. Farmer asserts that authentic assessment has the best results if students are also involved in assessing their own work as well as their peers'. This type of assessment was present in this research as students used the Big 6™ Assignment Organizer for Grades 3-6 (Jansen, 1999).

As previously discussed, the role of the LMS was considered in the process of achieving literacy standards. Gross and Kientz (1999) describe the LMS as a collaborator. Farmer (1997) sees the LMS as a facilitator. Brock (1994) elaborates the idea of facilitator by describing a continuum:

[LMSs] provide (sic) initial information about processes and resources to individuals and to small and large groups of students. They plan and implement activities that give students an opportunity to use these processes and resources in a practice setting. Finally, they are available to provide individual help in response to the needs of students working independently. (p. 4)

The assessment of the role of the LMS in this study was subjective since the researcher was the LMS that worked with the students and classroom teachers. A journal reflecting the daily interactions with the teachers and students was helpful in identifying the various roles practiced during this research. A rubric listing various roles of the LMS was used to help assess the roles performed as reflected in the journal.

The Theoretical Framework

The hypothesis going into this research is that computer technology will help students achieve information literacy. While no theories have been definitively stated per se, according to Farmer (1997), there is an underlying theory that "outcomes need to be

authentic: that is, true to life and reflecting lifelong learning skills. Outcomes should also be used to answer essential questions and use high-order thinking skills” (p. 3).

In the same vein of thought, if information skills are to be achieved, four basic requirements apply, according to Johnson and Eisenberg (1996):

- Information skills must be tied together to content areas of curriculum;
- Information skills need to be tied together in a logical and systematic information process;
- Successful integrated information skills programs are designed around collaborative projects; and
- There is benefit to combining the computer literacy and information literacy curricula. (p. 3)

In this research, the researcher used the Big Six skill approach designed by Eisenberg, Johnson, and Berkowitz. There are six steps designed to help develop information literacy in students: “1) task definition, 2) information seeking strategies, 3) location and access, 4) use of information, 5) synthesis, and 6) evaluation” (Eisenberg and Johnson, 1996, p. 7-8). This model was easily adaptable for the classes using computer technology as well as for the classes not using computers. The hope was that by using the Big Six process, it could be determined if computer technology helped students achieve information literacy.

Summary

There is an abundance of literature concerning information literacy, computer technology, and the roles of the library media specialist. The literature, while showing a wide divergence of thinking on these topics, agrees that these areas are rapidly changing

because of technological advances, the mushrooming quantity of information, and their changing implications for libraries and the roles of library media specialists. Brock captures the essence of this in her discussion of the implications of her study:

Parents, administrators, teachers, teacher-librarians and students are intrigued by technology and the instant access to the massive amounts of data it brings. In the push to fund and implement technology... designed to raise student achievement, the importance of the information intermediary has often been overlooked... Assuming and raising awareness of the information intermediary role, however, are crucial if teacher-librarians are to solidify their positions within today's volatile education environment. (1994, p. 5)

Chapter Three

The Methodology

Introduction

There are more computers in schools than ever. According to the Statistical Abstract of the United States (U.S. Bureau of the Census, 1998), there are over 8 million computers for student instruction in elementary and secondary schools as compared to 2.4 million in 1990 (Department of Education, 1996). And it follows that with the increased number of computers, their usage is also increasing. There is an abundance of software from which to choose for a wide variety of curriculum-related subjects and activities. More and more school libraries are becoming automated which permits easy access to information and materials within the library as well as from beyond the library. But the question remains, does all this computer technology make a significant difference with respect to student achievement? Specifically, for this research, can computer technology help elementary school students achieve information literacy—the efficient and effective access to information, the critical and competent evaluation of information, and the accurate and creative use of information? The literature has indicated a mixed reaction to this question. To summarize their conclusions, generally speaking, schools that invest in computer technology, integrate its use into a well-planned curriculum, and keep teaching and teacher training a priority, may demonstrate better results in student achievement than schools that do not. Elementary school being the focus of this

research, Healy's caution about the use of technology with younger students bears repeating:

Technology shapes the growing mind. The younger the mind, the more malleable it is. The younger the technology, the more unproven it is. We enthusiastically expose our youngsters to new digital teachers and playmates, but we also express concern about the development of their brains, bodies, and spirits. Shouldn't we consider carefully the potential—and irrevocable—effects of this new electronic interface with childhood? (1998, p. 17)

The literature indicates that technology alone will not assure student achievement. As Brock suggests, the teacher-librarian's roles of instructing, coaching, and facilitating are important in student achievement (1994). As teachers guide students in accessing, evaluating, and using information with computer technology, the potential for student achievement increases.

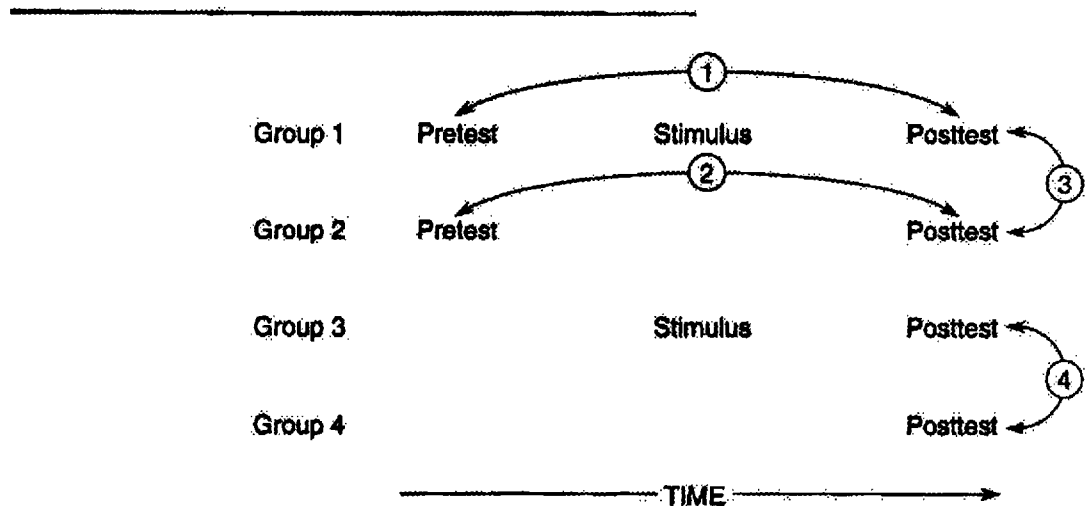
The purpose of this research was to conduct an experiment at the elementary school level to compare the achievement of information literacy between students who used computer technology and those who did not. Another aspect of the research was to evaluate the various roles the library media specialist in the process of achieving information literacy.

Solomon four-group design

The Solomon four-group design was selected for this study. Solomon first published the design in 1949. This design is defined as "a randomized experimental design consisting of two treatment versus two control groups. One set of two groups has a pretest and posttest, and the other set of two groups has only a posttest" (Sawilowsky and Kelly, 1994). Babbie (1998) illustrates the design succinctly and effectively:

Figure 1

The Solomon Four-Group Design



From *Practice of Social Research, 8th edition*, by E. Babbie. 1998. Reprinted with permission of Wadsworth, a division of Thomson Learning. Fax 800 730-2215.

In this study, the researcher would predict the following to happen in the experiment at the circled numbers:

1. Group 1 should show improved scores on the posttest.
2. Group 2 should show posttest scores about the same as the pretest.
3. Group 1 should show more improvement than group 2.
4. Group 3 should show better results on the posttest than group 4.

There are, admittedly, weaknesses in the Solomon four-group design.

Sawilowsky and Kelly (1994) discuss some of the weaknesses in a study of meta-analysis and the Solomon four-group design, including some concerns in which an earlier study

“raised specific issues regarding... the power of the technique compared with classical statistical procedures...” (p. 4). However, the selection of the Solomon four-group design for this research was based on its strengths. Babbie (1998) summarizes two strengths of this design:

Not only does the Solomon four-group design rule out interaction between testing and the stimulus, it also provides data for comparisons that will reveal the amount of such interaction that occurs in the classical experimental design. This knowledge would allow a researcher to review and evaluate the value of any prior research that used the simpler design. (p. 244-245)

The Solomon four-group design is most valid and reliable when subjects have been assigned randomly to different groups. For this research, however, a quasi-experimental design was used. That is, it had “treatments, outcome measures, and experimental units, but [did] not use random assignment to create the comparisons from which treatment-caused change is inferred” (Sawilowsky and Kelley, 1994). The students participating in the study did so according to their assigned classroom rosters in the normal course of scheduled library class time.

Design of the study

The selection of the Solomon four-group design was intended to help the researcher compare the achievement of information literacy among four groups of elementary school students. The students were not randomly selected for each group, but participated in the activities as members of their assigned classes, thus, the designation of quasi-experimental research. The four groups were made up of two fourth grade classes and two fifth grade classes. One fourth grade and one fifth grade class were allowed the use of computers in their library activities for a given unit of study. The other two classes

were control groups in which the independent variable, computers, was not introduced. The fourth grade classes were pretested, since it was anticipated that they had the greatest potential to demonstrate the most growth in achieving information literacy as described in this research. The fifth grade were not pretested, thus minimizing interaction between the testing and the stimulus. This allowed the researcher a truer comparison of the results of the posttest among the four groups. As for which classes used computers and which did not, the selection was purely random. There were no prerequisites determining which classes were selected to use computers.

The activities assigned to each group were the same. In collaboration with the classroom teachers, it was decided that the students would research information on African Americans during February, Black History month. A packet of information entitled "A Heroic Heritage" (Gress and McLaurin, 1996) was created that contained various vocabulary activities and research activities related to African American people. Students were asked to select an activity from each of the two activity pages and to complete the search for information from a variety of sources that would enable the project to be completed. In order to accomplish their selected activities, it was determined that each student would demonstrate information literacy skills at a particular level of competency.

To guide the students through this process, The Big 6™ Assignment Organizer (Jansen, 1999), based on Eisenberg and Berkowitz's Big Six™ Information Skills, was used to teach the students the steps and to help them in their organization (see Appendix). The Big Six™ steps include 1) task definition, 2) information seeking strategies, 3) location and access, 4) use of information, 5) synthesis, and 6) evaluation. The

information literacy standards that focus on the access, evaluation, and use of information most closely relate to Big Six™ steps 2, 3, 4, and 5, the focus of this research. The researcher observed the students in their use of the Big 6™ Assignment Organizer as they worked on their projects. Additionally, a Big 6™ Rubric for Assessment was designed for the researcher to evaluate students' progress at each step of the project (see Appendix). Values were assigned at each level of competency at each step. The highest values, when added together, equaled a perfect score of 20. A rubric for each student was used to assess achievement. Each student's points at each step were added up, then multiplied by 5 to ascertain a percentage score. These scores were then averaged to determine a class's level of relative achievement as compared with the other classes.

A second rubric was designed for the purpose of assessing the roles of the library media specialist at each step of the Big Six™ Information Skills process (see Appendix). The three roles used in the rubric—instructor, coach, and facilitator—were taken from Brock's study (1994). She concluded from her study that “[t]eacher-librarians do help students define information-based problems [Big Six™ step 1]; develop information-seeking strategies [Big Six™ step 2]; locate information [Big Six™ step 3]; gather and assess information [Big Six™ step 4]; synthesize information [Big Six™ step 5]; and present, evaluate and refine results [Big Six™ step 6]” (p. 3). The purpose of including this in this research is to evaluate these roles in the context of this study. In addition to all the above, a journal was also maintained by the researcher to make anecdotal records during and after class sessions.

Participants

The students that participated in this study were fourth and fifth graders. These students were heterogeneously grouped in four classes of 21 or 22 students each. Of the 86 students, 47 (55%) were female and 39 (45%) were male. All students were English-speaking. Seventy (81%) of the 86 students were Caucasian, 16 (16%) were African American, and 2 (2%) were classified as other. The average Student Ability Index, the term used by the Stanford Achievement Test, was 110. The range of index scores was from a low of 78 to a high of 137. Nine (10%) students in the study attended special remedial classes twice a week. Fifteen (17%) students had a Student Ability Index of 120 or higher.

Instrumentation

Since the achievement of information literacy was the focus of this study, a pretest was designed to test students primarily for their knowledge about the access, evaluation, and use of information (See Appendix). Items included multiple-choice questions about how a student might plan a research project, the evaluation of a source, where they would locate the sources, and how they would locate information within a source, such as an encyclopedia.

Pretesting and posttesting alone would not be sufficient in itself for determining student achievement, so the Big 6™ Rubric for Assessment was designed to help assess progress of the students' activities at each step of the Big 6™ Information Literacy Skills. Competency was ranked in four categories—Highly Competent, Competent, Adequate, and Not Yet Competent. Descriptions were made for each rank of competency at each

step of the six skills (Little, 2000). Another section of the rubric was designed to allow the assigning of point values at each skill step according to the level of competency (Schmuhl, 1998). It is acknowledged that evaluating students' progress, or achievement, in this way was somewhat subjective, but the use of the rubric as it was designed helped to eliminate some of the subjectivity by focusing on the same aspects of achievement for all students. One rubric per student was used.

Because the role of the library media specialist was also a part of this study, the Rubric for Library Media Specialist Role(s) was used to study the roles of the librarian throughout the study. Using Brock's (1994) study, the roles of instructor, coach and facilitator were used, as well as her descriptors of each role's activities at each of the six steps of information search and use. Brock does not offer specific definitions for each role, per se, but rather describes activities that occur for each of the three roles at each step in the intermediary process. One rubric was used for each of the four classes.

Data Collection and other Procedures

A pretest was given to fourth grade after the students had been presented with the packet of information about their project. In this way, the test items had some context as opposed to the test being taken without any frame of reference.

As students worked on their projects for four or five library classes, the Big6 Rubric for Assessment was maintained for each student. At the end of the allotted time for the study, each student's rubric was scored and totaled. Then the class average for each item was totaled from the students' rubrics.

A journal was also maintained for the purpose of keeping informal anecdotal notes at the end of each day the students worked on the project in the library. Observations were made concerning the process for completing the project, their ability, or lack of ability, to locate information independently and the completed project itself. Informal feedback from the classroom teachers and the computer teacher who assisted me in the library some days, were also recorded.

While the Rubric for Library Media Specialist Role(s) was not as precise, the descriptors under each role at each of the six steps helped the researcher to reflect what roles were being played throughout the process. The journal was also helpful in the evaluation of the library media specialist in reflecting on what transpired each day.

At the completion of the project, after six class sessions, a posttest was given to all four classes (see Appendix). The questions remained constant between the pretest and the posttest. It was hoped that the experience of going through the search for information and then using it in a creative way would help the participants on the posttest.

Data Analysis Plan

The pretest and posttest were scored and comparisons made between them. While the overall score of the tests was of interest, it was also of interest to see if any particular item(s) on the tests had significant improvement. Also, if improvements were observed in a particular group of students, could the cause(s) for the improvement be determined?

Next, comparisons were made between the fourth grade, which took both the pretest and posttest, and the fifth grade, which only took the posttest. Was there any discernible interference in the experiment with the pretest? Were there any other notable

differences among the four classes, or between the two sets of classes—those that used computers and those that did not?

The Big6™ Rubric for Assessment was scored for each student. The scores were tallied for each of the six skills steps and, then, totaled and analyzed for each class. Then comparisons were made among the classes, especially focusing on the comparison between the two classes where the variable of computer use was introduced, and the two control groups that did not use computers. It was important to search for any particular strengths or weaknesses that might be revealed in either group and attempt to explain the causes for those strengths or weaknesses. The informal journal notes could be of benefit for the observations made during and after each class session.

Finally, the rubric for determining the roles of the library media specialist was analyzed. Were the roles defined by Brock (1994) reaffirmed? At which of the six skills steps were the particular roles most concentrated? Could it be determined to what extent the library media specialist played a role in students achieving information literacy as this study was designed?

Summary

In summary, students were given a project in which they selected activities that would assess their achievement of information literacy. The Solomon four-group design was used to conduct quasi-experimental research with two fourth grade and two fifth grade classes of students. Fourth grade classes were administered pre- and posttests for comparison. Fifth grade classes were administered posttests only. The independent variable—computer technology—was introduced to one fourth grade class and one fifth

grade class. The other fourth grade class and fifth grade class were used as control groups. Rubrics were used to assess the achievement of each student at each step of the information skills process as well as the end product. A rubric was also used to assess the roles of the teacher-librarian at each step of the information skills process. Finally, a journal was maintained for the purpose of recording anecdotal notes that might enrich, and possibly explain, the data collected.

Chapter Four

Results

Introduction

The purpose of this research was to conduct an experiment with fourth and fifth grade students comparing achievement of information literacy between one set of classes that used computer technology and one set that did not. Pretesting and posttesting were a part of the research. Student practices of searching for information and librarian roles related to those practices were observed. In particular, students were given an information problem-solving task and were observed in the process of accessing, evaluating, and using information to solve the problem. The roles of the librarian in each step of the process were also examined.

The Solomon four-group design was used to conduct a quasi-experiment between two sets of students (see Figure 2).

Figure 2

Structure of the Solomon Four-group Design for this research

	<u>Pretest</u>	<u>Stimulus</u> (use of computers)	<u>Posttest</u>
Class 1 (4 th grade)	X	X	X
Class 2 (4 th grade)	X		X
Class 3 (5 th grade)		X	X
Class 4 (5 th grade)			X

As Figure 2 indicates, the fourth grade classes were pre- and posttested. The fifth grade classes were only posttested. One set of classes (Classes 1 and 3) had the use of computers available to them; the other set (Classes 2 and 4) did not. The researcher was a participant observer, that is, played the role of teacher-librarian in the normal course of library instruction.

Method of Evaluation

Using the Solomon four-group design, pre- and posttesting were conducted on classes 1 and 2, posttesting only was conducted on classes 3 and 4. The tests consisted of ten multiple-choice questions designed to assess students' knowledge of where and how to locate information from a variety of sources (see Appendix). The tests also assessed their knowledge of the process of locating, evaluating, and using information—information literacy.

Students used the Big 6™ Organizer (Jansen, 1999) to teach them the information literacy process (see Appendix). It was also used to help guide them through their search project entitled “A Heroic Heritage” (Gress and McLaurin, 1996). A Big 6™ Rubric for Assessment was designed to assess each student in his/her competency at each of the Big 6™ steps (see Appendix).

To assess the roles of the librarian in the information literacy process, a Rubric for Library Media Specialist Roles was designed (Brock, 1994) (see Appendix). The researcher used the rubric to assess his activities with the students throughout the project.

By using these three methods of evaluation—pre- and posttesting, the Big 6™ Rubric for Assessment, and the Rubric for Library Media Specialist Roles—the

researcher hoped to gain insight into answering the question of whether computer technology helped elementary students achieve information literacy.

Results

The results for this experiment were inconclusive. The differences in test scores and rubric assessments among the four groups, overall, were minimal. Each method of evaluation is examined in the following sections and conclusions drawn in Chapter 5.

Pretests and posttests. Table 1 compares the overall results of the pre- and posttests for Class 1 and Class 2.

Table 1

Pretest and Posttest Results for Classes 1 and 2

	<u>Class 1</u>		<u>Class 2</u>		<u>Total</u>	
	<u>Pre-</u>	<u>Post-</u>	<u>Pre-</u>	<u>Post-</u>	<u>Pre-</u>	<u>Post-</u>
Total Correct Answers/ Total possible	84/ 180	114/ 180	110/ 200	107/ 200	194/ 380	221/ 380
Total correct answers (%) (# correct answers / total possible answers)	47%	63%	55%	54%	51%	58%

There was a four-week lapse between the pre- and posttest. Correct answers to each question were tallied and totaled for each class. The results shown in Table 1 indicate an improvement of 7% in the total scores for both classes between the pretest and the posttest. Class 1, in which the variable computer technology was introduced, shows a 16% increase as compared to Class 2, the control group, which shows a 1% decrease in correct answers. At first glance, then, it would appear that Class 1 benefited from the use

of computers in their work. However, as details of the pre- and posttest scores are analyzed, as well as the assessments made by the researcher, that conclusion may not be supported.

Tables 2 and 3 show the results in more detail in that they break out the tests into the two types of questions that appeared on the tests—questions about the location of information (1, 3, 4, 5, and 6) and questions about the information literacy process (2, 7, 8, 9, and 10).

Table 2

Pretest and Posttest Results for Classes 1 and 2: Questions About Location

Question	Number of students with correct answers (Percent of total students)					
	Class 1		Class 2		Total	
	Pre- n=18	Post- n=18	Pre- n=20	Post- n=20	Pre- n=38	Post- n=38
1	10 (56%)	16 (89%)	15 (75%)	13 (65%)	25 (66%)	29 (76%)
3	4 (22%)	8 (44%)	7 (35%)	7 (35%)	11 (29%)	15 (39%)
4	17 (94%)	17 (94%)	18 (90%)	19 (95%)	35 (92%)	36 (95%)
5	9 (50%)	13 (72%)	10 (50%)	12 (60%)	19 (50%)	25 (66%)
6	5 (28%)	2 (11%)	7 (35%)	5 (25%)	12 (32%)	7 (18%)
Total correct answers/ Total possible	45/ 90	56/ 90	57/ 100	56/ 100	102/ 190	112/ 190
Total correct answers (%) (# correct answers / total possible answers)	50%	62%	57%	56%	54%	59%

For questions about location, Table 2, Class 1 improved a total of 12% on the posttest while Class 2 showed a decrease of 1%. Although Class 1 showed more improvement, it scored much lower on the pretest than Class 2. The posttest results for Class 1 indicate they performed slightly better than Class 2 overall. Class 1's improvement can be attributed to the much-improved correct responses on questions 1, 3 and 5 on the posttest. Sixteen students, out of 18 correctly identified fiction as the least reliable source for facts about a person in question 1 on the posttest. Eight students in Class 1 correctly identified the call number for a biography of Martin Luther King, Jr., an increase from four on the pretest. Thirteen students in Class 1 were able to recognize two names in the list of responses for question 5 that could be located in volume 18 of the illustrated encyclopedia. All of these questions had to do with print media and it is not clear how access to computers during the experiment correlates to improved posttest scores.

When Class 1's pre- and posttest scores are compared to Class 2's scores on Table 2, it is noteworthy that Class 2's scores actually decreased on the posttest. Class 2's correct responses declined on question 1 and remained the same on question 3, as compared to Class 1's improved scores on both of these questions. Class 2's score declined on question 6 as well. In fact, both classes performed poorly on this question in both the pre- and posttests. Question 6 was designed to test students' knowledge of the parts of a book. On the posttest, only five students in Class 2 correctly identified the Table of Contents and the Index as the places locate information located in a book.

It was anticipated by the researcher that Class 2, having access only to print resources for this experiment, might do better on these particular questions on the posttest. Clearly, this was not the case.

Table 3 shows a comparison of the pre- and posttest results for questions about the process of accessing, evaluating, and using information. It was anticipated that Class 1, the experimental group, might demonstrate greater improvement in scores on these questions, and they did. As Table 3 shows, Class 1 improved 21 percentage points as compared to Class 2's decline of 2 percentage points.

Table 3

Pretest and Posttest Results for Classes 1 and 2: Questions About the Process of Accessing, Evaluating, and Using Information

Question	Number of students with correct answers (Percent of total students)					
	Class 1		Class 2		Total	
	Pre- n=18	Post- n=18	Pre- n=20	Post- n=20	Pre- n=38	Post- n=38
2	8 (44%)	13 (72%)	9 (45%)	5 (25%)	18 (47%)	18 (47%)
7	10 (56%)	17 (94%)	12 (60%)	15 (75%)	22 (58%)	32 (84%)
8	3 (17%)	1 (6%)	6 (30%)	3 (15%)	9 (24%)	4 (11%)
9	15 (83%)	15 (83%)	15 (75%)	14 (70%)	30 (79%)	29 (76%)
10	3 (17%)	12 (67%)	11 (55%)	14 (70%)	14 (37%)	26 (68%)
Total correct answers/ Total possible	39/ 90	58/ 90	53/ 100	51/ 100	93/ 190	109/ 190
Total correct answers (%) (# correct answers / total possible answers)	43%	64%	53%	51%	49%	57%

Questions 2, 7, and 10 account for the increased scores on the posttest for Class 1. More students in Class 1 recognized in question 2 that research begins with asking questions. There was also marked improvement on question 7—how information might be recorded—although it was a poorly constructed question. The most improvement by Class 1 occurred on question 10, a question designed to help students recognize the importance of evaluation as a last step in the information literacy process. In these same questions—2, 7, and 10—Class 2's scores decreased in question 2 and made only slight increases in questions 7 and 10.

Both classes did worse on question 8 on the posttest. This question had to do with evaluating information and both classes demonstrate weakness on this point. Class 2 did slightly worse in the posttest on question 9 as well as on questions 2 and 8. These declines account for the overall decline of 2% for Class 2 on the posttest. Possible explanations for the differences between Class 1 and Class 2 will be discussed in Chapter 5. An examination of the total scores for both classes shows a slightly better gain in the questions about process (Table 3) than in the questions about location (Table 2). While Table 2 indicates a 5 percentage point increase in question about location, Table 3 indicates an 8 percentage point increase in questions about process. This slightly improved score might be explained because of the emphasis given to the Big 6TM skills steps in this research.

The pre- and posttest results for Classes 1 and 2 shown in Tables 1, 2, and 3 indicate that Class 1, the experimental group that used computer technology, demonstrated greater improvement on posttest scores than did Class 2, the control group.

The posttest was administered to all four groups, and Table 4 compares the overall posttest scores taken by Classes 1, 2, 3, and 4. Tables 5 and 6 break out into detail the scores by the types of questions—location and process—as was done in Tables 2 and 3.

Table 4

Comparison of Posttest Scores for Classes 1, 2, 3, and 4

	<u>Class 1</u> n=18	<u>Class 2</u> n=20	<u>Class 3</u> n=20	<u>Class 4</u> n=20	<u>Total</u> n=78
Total correct answers/ Total possible	114/ 180	107/ 200	116/ 200	120/ 200	457/ 780
Total correct answers (%) (# correct answers / total possible answers)	63%	54%	58%	60%	59%

Table 4 indicates a range of scores from a high of 63% to a low of 54%. It is interesting to note that Class 1 and Class 2 represent the highest and lowest scores respectively—both fourth grade classes. Scores for Classes 3 and 4 fall between Classes 1 and 2. All four classes' scores are no more than 5 percentage points from the total average of 59%. Generally, all four classes performed about the same on all parts of the posttest.

Table 5 shows a range of scores for all four classes from 62% to 56% for total correct answers. No score is more than 4 percentage points from the total score of 58%.

Table 5 also indicates that all classes performed poorly on question 3, recognizing a call number on a biography. They also did poorly on question 6, a question about

locating information within a book. Follow-up with the classes may ascertain the reason for the low scores on these questions that should have been familiar territory for these grade levels.

Table 5

Comparison of Posttest Scores for Classes 1, 2, 3, and 4 on Questions About the Location of Information

<u>Question</u>	Number of students with correct answers				
	<u>Class 1</u> n=18	<u>Class 2</u> n=20	<u>Class 3</u> n=20	<u>Class 4</u> n=20	<u>Total</u> n=78
1	16	13	17	17	63
3	8	7	4	6	25
4	17	19	17	19	72
5	13	12	15	9	49
6	2	5	3	6	16
Total correct answers/ Total possible	56/ 90	56/ 100	56/ 100	57/ 100	225/ 390
Total correct answers (%) (# correct answers / total possible answers)	62%	56%	56%	57%	58%

Table 6 shows similar scores by all four classes on questions about the process of locating, evaluating, and using information. A closer look at a few specific questions, however, reveals some greater discrepancies in scores. The two control classes, Classes 2

and 4, performed much lower than the experimental classes on this question. A greater number of students in the experimental classes (1 and 3) correctly identified in this question that, in research, making a list of questions comes before planning one's search, locating information or evaluating information. Most of the incorrect answers by students suggested that they would first plan how to conduct their research without first formulating questions for which they would search answers. No explanation can be given for this difference between the control classes and the experimental classes except for differences in instruction that may have occurred.

Table 6

Comparison of Posttest Scores for Classes 1, 2, 3, and 4 on Questions About the Process of Locating, Evaluating, and Using Information

<u>Question</u>	Number of students with correct answers				
	<u>Class 1</u> n=18	<u>Class 2</u> n=20	<u>Class 3</u> n=20	<u>Class 4</u> n=20	<u>Total</u> n=78
2	13	5	12	2	32
7	17	15	20	20	72
8	1	3	5	3	12
9	15	14	8	19	56
10	12	14	15	19	60
Total correct answers/ Total possible	58/ 90	51/ 100	60/ 100	63/ 100	232/ 390
Total correct answers (%) (# correct answers / total possible answers)	64%	51%	60%	63%	59%

Table 6 also shows that class 3, an experimental class, performed much lower on question 9 than the other classes. This question was designed to test students' knowledge of the necessity of a bibliography to credit sources of information. The incorrect responses for this class were evenly distributed among choices 'b' (biography), 'c' (write a list of titles), and 'e' (nothing). It is not clear to the researcher why this class did so poorly on this question, especially since several lessons had been taught on the writing of bibliographies prior to this research.

All classes performed poorly on question 8 (Table 6), a question about evaluating information. While they saw merit in the individual response choices, i.e. considering the author, copyright, content, other sources and comparing sources, they failed to see that "all the above" should be considered when evaluating information.

In summary, the results of the pre-and posttests show that Class 1 improved its posttest scores to a greater degree than Class 2. But it must be noted that Class 1 initially scored much lower on the pretest, and the improvement on the posttest brought the score up to a level slightly higher than Class 2. An examination of posttest scores by all four classes is inconclusive; the evidence does not indicate that any group achieved information literacy much better than any other. Table 4 shows that the greatest difference between the total average test score for all four classes (59%) and any one class was 5 percentage points—Class 2 with 54% correct answers. Table 5 shows no more than 4 percentage points between the total average score (58%) and any one class—Class 1 with 62% correct answers. The greatest difference between any one class and the

total average score (59%) on Table 6 is 8 percentage points—Class 2 with 51% correct answers. Generally, all classes performed about the same on the posttests.

Big 6™ Rubric for Assessment. A rubric was designed to assess student competency at each step of the information skills process—The Big 6™ Rubric for Assessment (see Appendix). One rubric was used for each student in the experiment. The rubric was based on Eisenberg and Berkowitz’s Big 6™ Information Literacy Model (Johnson, 1996, p. 9). The six steps in the model are, 1) Task definition; 2) Information seeking strategy; 3) Location and access; 4) Use of information; 5) Synthesis; and 6) Evaluation. The rubric enabled the researcher to further study the students while in the process of accessing, evaluating, and using information throughout the project and make qualitative analysis. Although the rubric was more subjective in nature, it was designed to put some quantitative measures in place that would help inject a degree of objectivity into the process of evaluating the students.

Four categories were established to rank students’ attributes of competency at each of the six steps as demonstrated by the students throughout their project. The designation of numerical values for each attribute was determined by the focus of this research—information literacy—which most closely correlated to Big6™ Skills steps 2 through 5. Therefore, a greater numerical value was given to these specific attributes. Steps 1 and 6, while important, were less a part of this research and were, assigned lesser values. A perfect score at all six steps would yield a total point value of 20. This number could then be multiplied by 5 to equal a percentage score.

Table 7 shows a comparison of each class’s competency level at each step of the Big 6™ process. The rubric ranked students in four categories—highly competent,

competent, adequate, and not yet competent (Little, 2000). The note below Table 7 summarizes the values of each level of competency at each step, and, thus, explains the numerical value (class average) for each class.

Table 7

Summary of Results of the Big Six™ Rubric for Assessment

	Comparison of Competency for Each Class				
	<u>Class 1</u>	<u>Class 2</u>	<u>Class 3</u>	<u>Class 4</u>	<u>Total</u>
<u>Big Six Skills</u>					
#1 Task definition	1.36	1.63	1.74	1.50	1.55
#2 Information Seeking Strategy	1.90	2.65	2.25	2.60	2.34
#3 Location and Access	2.40	3.25	3.11	3.14	2.96
#4 Use of Information	2.27	2.50	2.54	2.48	2.50
#5 Synthesis	2.40	2.40	2.30	2.38	2.38
#6 Evaluation	0.93	1.30	1.12	1.19	1.13
Total	11.26	13.73	13.06	13.29	12.86
Total x 5=%	56%	69%	65%	66%	64%

Note. For steps # 1 and #6, competency values are: 2 = Highly competent, 1.5 = Competent, 1 = Adequate, 0.5 = Not yet competent. For steps #2, #3, #4, and #5, competency values are: 4 = Highly Competent, 3 = Competent, 2 = Adequate, and 1 = Not yet competent.

In order to bring a higher level of accuracy to the researcher's subjective assessments, he informally interviewed approximately half of the students in each class in the process of working on their project. This was done randomly as students asked for assistance or as they were available for a few minutes in the course of their work.

Individual student scores were tallied, and totaled, and then averaged for each class at each step. Then the six steps were totaled, with 20 being a perfect score. To convert the score to a percentage, the score was multiplied by 5. The totals in Table 7 indicate a range of percentage points from a low of 56% to a high of 69%. Interestingly, it is the fourth grade classes—Classes 1 and 2—who again scored the highest and lowest out of the four classes. However, their scores were the reverse of the results in the posttest (Table 4). Class 1 scored the highest percentage on the posttest, but scored the lowest on the rubric assessment. Class 2 scored the lowest on the posttest, but scored highest on the rubric assessment. What could account for this? One possibility might be one class's superior test taking skills. Another more likely explanation might be the more subjective nature of the rubric assessment versus the more objective nature of the multiple-choice test. The researcher strived for as complete impartiality and objectivity as possible in his observations and assessments. Nevertheless, the researcher observed a higher level of competency at steps 2, 3, and 4 in Class 2 as compared with Class 1, and this probably accounted for the difference. The use of computers at the school is only a few years old, therefore, students have had limited formal instruction. Also, students have very limited access to computers because of scheduling limitations and few computers. The students in Class 1, who had access to computers, were motivated and excited about their use of computers, but struggled at times in their searches due to

inexperience or were distracted by unrelated, but attractive, images on screen. The students in Class 2 seemed more comfortable and familiar with the traditional sources of information, such as the encyclopedia, and were able to locate information much more readily and easily. This was true for both fourth grade and fifth grade control classes.

Classes 3 and 4—fifth grade—once again scored between the high and the low scores just as they did in the posttest results. Overall, the classes' scores are quite similar in their totals—all within a range of 13 percentage points—and are very similar also at each of the six steps.

To summarize, the results of the rubric assessment are inconclusive; the evidence does not indicate definitively whether or not computer technology helps students achieve information literacy.

Rubric for Library Media Specialist Roles. The Rubric for Library Media Specialist Roles helped to identify which librarian roles were in evidence at each step of the process (Brock, 1994). This rubric was a less formal instrument for data collection and used by the researcher to reflect on the roles that had been in evidence during each day's work throughout the experiment. It came as no surprise that all three roles—**instructor, coach, and facilitator**—were in evidence at each and every step of the process, although one particular role might have been more in evidence at a particular step at a particular time in the research. Brock defines these three roles by describing activities of the teacher-librarian at each of the six step of the intermediary process. For example, in step 1, task definition, the researcher played the role primarily of instructor, that is, building awareness of the topic and introducing strategies for selecting, developing, and refining the topic. This step took an entire library period (out of six) since building the

foundation at the initiation of the research was so important. But the other roles of coaching and facilitating were also present as the researcher responded to student inquiries during and after class.

The role of *instructor* took place at each step but the roles tended to shift toward coaching and facilitating as the students progressed through the steps. Students who were not yet competent at certain steps required some instruction throughout the process to get them back on track in their projects.

As a *coach*, the researcher was constantly offering guidance, direction, and advice on organizing data that students were working with. The coaching was sometimes initiated by the researcher, and sometimes in response to student inquiry. The ultimate goal of the researcher in this project, and in general practice, was to strive to make the students independent users of library resources. Or, in terms of the Big 6™ rubric, students would be “highly competent” at each of the six steps of the information literacy model.

The role of *facilitator* occurred at each of the six steps, as well. In this research, it occurred mostly at steps 2 through 5. Step 2, information seeking strategies, required the students to think about and list possible resources that would help them in their project. Their questions to the researcher indicated a weakness in this area and necessitated that the researcher help students consider *all* the possible resources they might need to use. (Note in Table 7, step 2, the low score by Class 1.) While most students were able to locate and access the information they were looking for (Step 3), there were a few who needed assistance locating biographies or using an index in a book. Many students needed help at steps 4 and 5 as they began to assimilate, evaluate, select, and plan how

they would use the information they were finding. Again, as in the role of coach, the goal of the role of facilitator was to help students become more independent in their use of library resources, an indication of information literacy achievement. To encourage this independence, the researcher was instructing in one way or another while at the same time playing the roles of coach and facilitator. These roles seemed seamless much of the time as movement along this continuum, as it were, was ongoing.

Summary

“The chief advantage of a controlled experiment,” according to Babbie, “lies in the isolation of the experimental variable and its impact over time” (1998, p. 251). This experiment sought to answer the question; can computer technology help elementary students achieve information literacy? The results were inconclusive. The pre- and posttesting conducted in the Solomon four-group design resulted in little difference among the four classes. Given more time, the results may have been more conclusive, but that is a topic that is addressed in chapter 5. The researcher’s assessments of the students individually and collectively as a group did not result in any superior demonstration of achievement by any particular group. The roles of the librarian— instructor, coach, and facilitator—were validated throughout the research. Conclusions about the results discussed in this chapter are addressed in Chapter 5.

Chapter Five

Conclusions

Summary

The purpose of this research was to attempt an answer to the question; “Can computer technology help elementary students achieve information literacy?” The research also sought to identify the roles of the library media specialist in the context and process of students achieving information literacy while solving an information based problem. The researcher was sensitive to issues raised in some of the literature about the use of computer technology with younger children and looked for any drawbacks to students using technology in the course of the study.

The research was conducted in the normal course of regularly scheduled library classes and instruction. Collaboration with classroom teachers helped to formulate a unit of study where students were required to search for information. A unit was created using Gress and McLaurin’s unit on African Americans entitled, “A heroic Heritage (1996). A variety of vocabulary and research activities were given to the students from which they made selections. In order to complete the activities, students needed to use information literacy skills—locating, using, and evaluating information.

One of the desired results of this study was that it would help guide the thinking for the strategic planning that the school is conducting to formally integrate information literacy standards into library instruction and content curriculum. This will benefit the

students and the school as a whole as the library media specialist works in collaboration with classroom teachers and administrators.

The Solomon four-group design was used to conduct a quasi-experiment using two fourth grade and two fifth grade classes over a five week period. The students in each of the four classes were fairly homogeneous in male/female ratios, ethnic mixes, and academic ability. The researcher was a participant observer in the role of librarian, which represented no change for the students from the normal weekly library setting and instruction.

Conclusions

Can computer technology help elementary students achieve information literacy? The results of this research were generally inconclusive but suggested that computer technology may help students achieve information literacy. Class 1's improvement in the posttest suggests a positive response to the question, although other assessments in the research suggest otherwise. The researcher feels that chances for success are enhanced if the right combination of teaching, technology, and a well-planned curriculum are in place (Healy, 1998). The absence of a well-developed curriculum being in place to support this experiment was a weakness that manifested itself in the work of the students. While Healy concludes that "...computers will doubtless help with [preparation for students' future use of technology], but the key will continue to lie in the quality of the teachers who plan, mediate, and interpret a thoughtful curriculum" (1999, p. 37), this research seems to confirm that the absence of "a thoughtful curriculum" will not result in clear-cut achievements. Thorpe's conclusion also resonates the same idea when he states, "...it is

the shift in teacher practice and the attendant shift in the basic culture of school—and not the technology itself—that will bring about the gains in student performance” (1999, p. 48).

Three information literacy standards were outlined in chapter one. Each one will be examined separately attempting to draw conclusions concerning the relationship between computer technology and student achievement of information literacy.

Standard 1: The student who is information literate accesses information efficiently and effectively (AASL & AECT, 1998, p. 8).

The results of the experiment as described in chapter 4 do not clearly demonstrate that the experimental groups that used computers achieved information literacy better than the control groups. Posttest results for Class 1, an experimental group, indicates an increase of 16%, which is quite different from Class 2, a control group, which decreased 1%. (See Table 2 on page 41.) It is difficult to draw a conclusion from test scores alone to explain why Class 1 achieved better than Class 2. The results of assessments made by the researcher on the students while working on their projects tell a different story. Table 7 on page 50 indicates that Class 1 demonstrated the least competency of the four groups in actual practice. While they demonstrated improved knowledge on the posttest, they did not demonstrate in practice the ability to access information efficiently and effectively. The ability to perform on a test did not translate to an ability to perform in “real life” in this experiment.

The other experimental group, Class 3, did not demonstrate exceptionally different scores on the posttest (see Tables 4, 5, and 6, p. 45-47) or competencies (see

Table 7, p. 50) than the control groups, Classes 2 and 4. Although students were limited in their time on the computer and were limited on the number of computers available, while motivated, they were not productive. Whether using a CD-ROM encyclopedia or using the Internet, most students just wanted to print pictures, or print out an entire article even though none of the activities in which students were involved required such printouts. The researcher believes that with more formalized instruction from a well-developed curriculum and guided experience, the students would have handled such an assignment better. The researcher predicts that a study of the same groups over a long period of time, perhaps one to five years, would indeed see them achieving more.

This research does not offer clear evidence that students who used computer technology in this study accessed information any more efficiently and effectively than students who did not use computer technology.

Standard 2: The student who is information literate evaluates information critically and competently (AASL & AECT, 1998, p. 8).

The results of the experiment do not demonstrate that the use of computer technology helped the experimental groups, Class 1 and Class 3, achieve Standard 2. The idea of evaluating information was specifically addressed in question 8 of the pre- and posttests. The question was, "You are thinking about making a poster that shows information about the life and accomplishments of an African American hero. How will you decide that a particular source of information, such as a web site or a book, is good enough to give you the information you need?" The choices offered were, "a) consider the author; b) consider the copyright; c) consider the content; d) consider other sources

and compare; e) consider all the above.” Of course, the answer is ‘e’ but as Table 4 on page 43 reveals, both Classes showed a decrease in correct responses on this question on the posttest. Table 6 on page 47, which compares the posttest results for all four groups, shows that all four classes scored very low on this question. “Evaluating information” takes place as the student is “using information.” Table 7 (p. 50), step 4, seems to confirm the posttest results in that all four classes demonstrated just slightly better than “adequate” in their use of information. It is difficult to support a direct correlation between the pre- and posttests and the summary of the Rubric for Assessment; the tests are objective in nature and the rubric is more subjective. However, in this specific instance, the assessment seems to bear out the posttest results.

An important reason these particular students did not do better on this standard is that they are inexperienced in evaluating materials. As elementary school students, they are still being taught the fundamentals of research. Teaching information literacy from a well-developed curriculum may help these same students in the future to achieve information literacy at higher levels of competency.

Another reason for the poor performance on this particular question had to do with the format of the question. Students later told the researcher that they were not used to multiple choice questions where the last choice is “...all the above.” More experience and instruction in test-taking skills may help these students in the future.

This research does not offer conclusive evidence that students who used computer technology evaluated information any more critically or competently than those that did not use computer technology.

Standard 3: The student who is information literate uses information accurately and creatively (AASL & AECT, 1998, p. 8).

Again, the results of this experiment did not demonstrate that the students who used computer technology achieved Standard 3 better than those who did not use computers. Questions 9 and 10 on the pre- and posttest are somewhat related to using information accurately and creatively. Question 9 tested the students on their knowledge about the use of a bibliography in research. Question 10 tested the students on their understanding of evaluating their work as a last step in a research project. The results for these questions are shown in Table 3 (p. 43) and Table 6 (p. 47). These tables indicate that the posttest scores are generally similar. Comparisons of these scores combined with the assessment of the researcher, Table 7 (p. 50), indicate that the students worked at an “adequate” level. What the researcher observed during the study were students who were eager to be creative in their work, but reticent to take the time locate and evaluate the information needed to make the project worthwhile. Perhaps because of the time constraints in the length of the experiment and the limited scheduled library times, students relied too much on prior knowledge to complete their work, thus making accuracy in their work questionable. Table 7 (p. 50), steps 5 and 6, reveals that the experimental groups (Classes 1 and 3) were not that different than the control groups (Classes 2 and 4). There is no clear-cut distinction among the four groups in steps 5 and 6, synthesis and evaluation.

This research does not offer conclusive evidence that students who used computer technology used information any more accurately or creatively than the control groups.

Summary of Information Literacy Standards

In chapter 1 of this research, the question was asked if the students would achieve best on any particular standard? While the pre- and posttest results and the Rubric for Assessment are not conclusive, the researcher observed a higher level of confidence at Standard 1 for all four classes. This is the standard that assesses the students' ability to access information efficiently and effectively. Location skills are an important part of the elementary school library curriculum and so the students, while not demonstrating their ability as well as had been hoped, did seem to handle this part of the experiment with more confidence. Evaluating the information they found critically and competently, Standard 2, and using the information accurately and creatively, Standard 3, are skills they have not yet developed as well. With continued instruction and experience from a well-developed curriculum, these same students in five years time may be able to demonstrate all three standards for information literacy at higher levels of competency. This raises a few questions, however. Is the achievement of information literacy dependent on children's ability to handle more abstract thinking? Are the information literacy standards developmentally sound? Further research is recommended to explore the answers to these questions.

The role of the library media specialist

The researcher, a participant observer in this research, was the teacher-librarian for the students who were part of the study. The roles of instructor, coach, and facilitator were in evidence throughout the experiment. These are roles that Brock identified in her study of teacher-librarians as information intermediaries in the information problem-

solving process (1994). The Rubric for Library Media Specialist Role(s) used in this research confirmed those roles that were in evidence at each step of the Big 6™ Information Skills model. Although there was not conclusive evidence that students who used computer technology achieved information literacy better than the control groups, it is beneficial to examine the role of library media specialist in this experiment. Primarily, the role of *instructor* was more in evidence than that of *coach* or *facilitator* for the simple reason that most of what the students were subjected to in the experiment was brand new, and instruction was needed to clarify their task. The Big 6™ Assignment Organizer for Grades 3-6 had to be taught to each class, which included building awareness and introducing strategies for selecting, developing, and refining the selection of a topic or activity in the first step, which was task definition. The students in the two classes using computer technology (Classes 1 and 3) demonstrated a wide range of abilities when it came to using CD-ROM encyclopedias or the Internet so the researcher took advantage of “teaching moments” as instruction was needed. This type of instruction took the form of helping students locate appropriate information within the CD-ROM multimedia encyclopedias or the Internet and determining its usefulness in solving particular problems in the students’ projects.

As students moved through the six steps, the researcher became more of a coach giving directions and providing feedback as requested or as needed. The role least used, in the opinion of the researcher, was that of facilitator. There seems to be some gray area between the roles of coach and facilitator, and future studies might seek to clarify all three roles. That may prove difficult, however, or perhaps even undesirable, since the three roles form a continuum through which teachers move seamlessly. Indeed, at times

all three roles were taking place simultaneously. The idea of clarifying the roles and their importance may need to be studied. Nevertheless, the role of facilitating occurred most in locating and accessing information (step 3) and the use of information (step 4), but the role of instructor always seemed to be most evident throughout the project.

At the elementary school level, it is not surprising to this researcher that the role of instructor would always be at the fore. It is in elementary school that students are taught the basic skills that will be used throughout the rest of their lives. It is quite probable that if these same students were observed in middle school or high school, the roles of coach and facilitator might be more evident in the library media specialist. The students' continuing experiences with computer technology and the information literacy process should result in more independent work as they reach higher grade levels in education.

Were there any weaknesses observed with the researcher being a participant observer? Yes. It was difficult to spend the necessary time with students using computers. Time limitations were ever present. Another factor was the limited experience and training of the researcher to instruct and help students in the technical aspects of computer technology. It requires much time from other instruction to deal with such matters. Hecht and Roberts noted similar feedback from teachers whom they interviewed in their research. The teachers in their study who were responsible for using technology expressed concern "that their use of the computer required a redirection of classroom time away from the traditional curriculum in order for the students to master and integrate the technology" (Hecht and Roberts, 1996, p. 7). Conducting this experiment in such a short space of time prevented this researcher sufficient time to

instruct the students thoroughly in the use of computers. The researcher agrees with Hecht and Roberts in their conclusion that for computer technology to be effective, it needs “to become an inclusive part of regular instruction and assessment, rather than an added feature, if students and teachers are to consider it of value” (1996, p. 7). The researcher is still in the process of making computer technology a regular part of instruction and assessment in library instruction.

This research has been largely evaluation research. As Babbie states, this kind of research attempts to measure the unmeasurable. “Evaluation research is a matter of finding out whether something is there or not there, whether something happened or didn’t happen” (1998, p. 336). Did anything happen in this research? The evidence does not conclusively demonstrate that computer technology helped the experimental classes achieve information literacy. But the study seems to support Healy’s conclusion that technology can contribute to learning if teaching retains priority and if technology complements a well-planned curriculum (1998). This study also confirms the roles of instructor, coach, and facilitator in the information literacy process according to Brock’s study (1994).

Recommendations

With the use of computer technology on the rise in schools, it will be important to continue to study its impact on students and their achievement at all grade levels. This research focused on students in elementary school, and therefore, focused its recommendations at the elementary level. Continuing, long-term research needs to be conducted on how the use of computers in elementary grades affects brain development

and academic achievement, social skills, etc. Both the quality and the quantity of computer use should be subjects for future study. In order to answer the question raised in this research, “Can computer technology help elementary students achieve information literacy? —students should be studied over a long period of time, such as over the period of an entire school year, or several school years. Longitudinal studies of five years or more should also be considered. Future studies must not only take into account student profiles, such as age, intelligence, and achievement, but should also consider teacher training in the use of available technologies, the role of the teacher-librarian, and the computer technologies being used in the educational process.

“Can technology contribute to learning?” According to Healy, “I think it can...*If*...teaching retain[s] priority” (Healy, 1998, p. 245). The second part of this study addressed the role of the library media specialist. The researcher’s recommendations support that of Brock’s, namely that the role of a library media specialist continue to be examined.

Attention should be given to the relationship between information intermediation and such variables as technology, teacher and teacher-librarian collaboration, and adherence to an information skills continuum and student achievement. As the resources and expectations associated with information use continue to change, there is a need for constant reexamination of the teacher-librarian role. (Brock, 1994, p. 4)

This research began with the question, “Can computer technology help elementary students achieve information literacy?” Healy quotes Philip J. Bossert,

Project Director for Hawaii Education and Research Network: “The key question is not ‘What is the role of information technologies in school?’ but rather ‘What is the role of schools in the age of information technologies?’” (Healy, 1998, p. 295). Technology is a permanent part of the educational landscape and will be a topic of discussion and research for years to come. Bossert’s comment offers a balance of thought for future studies in the area of technology.

A final thought about the use of technology, the achievement of information literacy, and the role of teachers and library media specialists comes from Healy’s research as described in her book *Failure to Connect: How Computers Affect Our Children’s Minds—for Better and Worse*. Her comments help keep perspective and balance in the ever-changing world of technology and education:

Although the route, the destination, and even our own children may look unfamiliar in this shifting landscape of new technologies, youngsters still need and want us to accompany them on the journey and to share their challenges, thoughts, and hopes. They may have to guide us into the technology, but it is still our job to guide them into life. (1998, p. 296-297)

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Appendix

February 4, 2000

Dear Mrs. Troutman,

I am currently working on my final obligation of my Masters Program at Rowan University—my Thesis Project.

My project is to study student achievement of information literacy. I am comparing two groups of students who will use computer technology and two groups who will not. The students included in this study will be fourth and fifth grades. This study will take place during the month of February and will be done in collaboration with the classroom teachers.

It is my hope that this will help us to improve our school's computer curriculum and library curriculum. In doing so, our students will be better prepared for their junior high and senior high school experience. I am requesting permission from The King's Christian School to conduct my project during the 1999-2000 school year.

Thank you for your consideration.

Respectfully,

David W. Calvanico
Elementary Library Media Coordinator

A Heroic Heritage

A unit of instruction for the library during February.
(Activities to Celebrate the History and the Accomplishments of African-Americans)

Objectives:

- Students will practice skills in accessing information efficiently and effectively.
- Students will practice skills in evaluating information critically and competently.
- Students will practice skills in using information accurately and creatively.
- Students will complete activities to celebrate the history, accomplishments, and contributions of African-Americans.
- Students will increase vocabulary knowledge of words related to Black history.

Grade Levels: Fourth and Fifth grades

Resources:

- Activity Packet: "Black History Contracts"
- Reference materials
Print: encyclopedia, biographies, biographical dictionaries, etc.)
Electronic (for two classes only): CD-ROM references, the Internet
- Internet sites:
"FEA Black History Month Resources"
www.feaonline.org/special/BHM.htm

"Black History Month"
www.kn/pacbell.com/wired/BHM/AfroAm.html

"Black History Month: A Celebration"
www.kron.com/specials/blackhistory/home.html

"Stamp On Black History"
<http://library.thinkquest.org/2667/Stamps.htm>

"Africans in America"
www.pbs.org/wbgh/aia/home.html

Harriet Tubman and the Underground Railroad for Children
<http://www2.lhric.org/pocantico/tubman/tubman.html>

Internet African American History Challenge
<http://www.brightmoments.com/blackhistory/>

Stamp on Black History

<http://library.advanced.org/10320/Stamps.htm>

World Book: The African American Journey

<http://www.worldbook.com/fun/aaajourney/html/index.html>

Famous African Americans: A WebQuest

<http://www.hazelwood.k12.mo.us/~cdavis01/webquests/pbw/>

- Construction paper
- Other art materials (markers, glue, scissors, etc.)

Instructional Roles:

Teacher:

- Encourage work on project by allowing time during school day.
- Direct student inquiries appropriately.
- Evaluate project for integration with content subject (curriculum).

Library Media Specialist:

- Pretest 2 groups on accessing, evaluating, and using information.
- Teach Big6 Skills.
- Introduce project options for research.
- Guide students in search for information.
- Evaluate students' progress.
- Evaluate finished student projects.
- Posttest 2 groups on accessing, evaluating, and using information.

Subject Integration:

Classroom teachers will determine which classroom (curriculum) subject(s) will be integrated with the unit to be taught in the library. Possible subjects include language arts, social studies, science, reading, and art.

Grouping:

This unit will use the Solomon four-group approach to determine if the use of computer technology helps students achieve information literacy to a greater extent than students who do not use computer technology. The groups will be set up as follows

	PRETEST	POSTTEST	COMPUTER USE
Fourth grade (4a)		X	
Fourth grade (4b)		X	X
Fifth grade (5a)	X	X	
Fifth grade (5b)	X	X	X

Students will work independently on the activities they select with guidance as needed.

Activities: See activity packets for the selection of activities to be given to students.

Evaluation:

- Big6 Rubric for Assessment (see attached sheets)
- Big6 Assignment Organizer

Appendices:

- Lesson plans
- Big6 Assignment Organizer
- Activities packets (Not included in thesis)
- Big6 Rubric for Assessment
- Rubric: Library Media Specialist Roles
- Pretest
- Posttest

LESSON PLANS

(February: Black History Month)

A Heroic Heritage

(A library unit of study for grades 4, 5, and 6)

LESSON 1 of 6

Objectives

- Students will recall the significance of the purpose of Black History month
- Students will be able to define what a hero is.
- *[Fifth grade classes will be pretested for the thesis research beginning with this lesson.]*

Biblical integration

Psalm 133:1 NIV “How good and pleasant it is when brothers live together in unity!”

Materials

- Activity packet for each student
- Book: *In the year of the boar and Jackie Robinson*
- *[Pretest for fifth grade classes]*

Procedure

- Read Psalm 133:1. “How can this verse be applied to the multicultural world we live in today?”
- Read chapter 6 (“June”) from *In the year of the boar...*
 1. Discuss the meaning of the quote, “This year, Jackie Robinson is at bat. He stands for himself, for Americans of every hue, for an American that honors fair play.”
 2. Discuss why Jackie Robinson is considered by many to be a hero.
 3. “What is a hero?”
 4. “Name some others that you think are heroes. Explain your choices.”
- Introduce the activity packet (briefly)
- *[Fifth graders get the pretest for the thesis research...]*
- Conclude the lesson by having them think, between now and the next lesson, about African Americans who could be considered heroes.

LESSON PLANS

(February: Black History Month)

A Heroic Heritage

(A library unit of study for grades 4, 5, and 6)

LESSON 2 of 6

Objectives

- Students will consider the phrase “heroic heritage” and its meaning.
- Students will make choices from a set of activities to complete over the next five sessions.
- Students will consider the Big6 Assignment Organizer to be used in helping them complete the activities expeditiously.

Biblical integration

Romans 15:5-7 NIV “May the God who gives endurance and encouragement give you a spirit of unity among yourselves as you follow Christ Jesus, so that with one heart and mouth you may glorify the God and Father of our Lord Jesus Christ. Accept one another, then, just as Christ accepted you, in order to bring praise to God.”

Materials

- Activity packet for each student
- The Big6 Assignment Organizer

Procedure

- Read Romans 15:5-7 “What is good about a ‘spirit of unity’?”
- Review idea of *heroes*. Do any come to mind? Explain your choice.
- Introduce packet:
 1. On the road to Freedom
 2. Black American Achievers Contract
 3. Gallery of Black American Achievers
 4. African-American Achievers’ HALL OF FAME
- Introduce The Big6 Assignment Organizer
 1. Preview all six steps.
 2. Complete steps 1 through 3
 - Task definition
 - Information seeking strategies
 - Location and access
- Place all materials in your portfolio.
- “All work on this unit must be completed in school (the library or your classroom).”

LESSON PLANS

(February: Black History Month)

A Heroic Heritage

(A library unit of study for grades 4, 5, and 6)

LESSON 3 of 6

Objectives

- Students will increase vocabulary of words related to Black History.
- Students will demonstrate their ability to access information efficiently and effectively.
- Students will demonstrate their ability to evaluate information critically and competently.

Biblical integration

Colossians 3:23 NIV “Whatever you do, work at it with all your heart, ...”

Materials

- Activity packet for each student
- The Big6 Assignment Organizer
- Print media: books, encyclopedias, magazines, Children’s Magazine Guides, Dictionaries
- Computers: The World Book Multimedia Encyclopedia [CD-ROM], Encarta 98 [CD-ROM], the Internet, other reference materials available on the computers.
- Art supplies and paper as needed by students for their selected activities

Procedure

- Read Colossians 3:23. “What advice does this verse give about work...?”
- Review The Big6 Assignment Organizer, steps 1-3 completed last session.
- Read through steps 4 (Use of information) and 5 (Synthesis) of The Big6 Assignment Organizer.
- The Time Line in step 5 will be completed as follows:
 - Session 3: gathering information
 - Session 4: gathering information/synthesizing
 - Session 5: synthesizing
 - Session 6: Evaluating (The posttest will be included in this session.)
- “Students, begin your search...!”
- “All work on this unit must be completed in school (the library or your classroom).”

LESSON PLANS

(February: Black History Month)

A Heroic Heritage

(A library unit of study for grades 4, 5, and 6)

LESSON 4 of 6

Objectives

- Students will increase vocabulary of words related to Black History.
- Students will demonstrate their ability to access information efficiently and effectively.
- Students will demonstrate their ability to evaluate information critically and competently.

Biblical integration

Colossians 3:23 NIV “Whatever you do, work at it with all your heart, ...”

Materials

- Activity packet for each student
- The Big6 Assignment Organizer
- Print media: books, encyclopedias, magazines, Children’s Magazine Guides, Dictionaries
- Computers: The World Book Multimedia Encyclopedia [CD-ROM], Encarta 98 [CD-ROM], the Internet, other reference materials available on the computers.
- Art supplies and paper as needed by students for their selected activities

Procedure

- Reread Colossians 3:23. “What advice does this verse give about work...?”
- Reread through steps 4 (Use of information) and 5 (Synthesis) of The Big6 Assignment Organizer.
- The Time Line in step 5 will be completed as follows:
 - Session 3: gathering information
 - Session 4: gathering information/synthesizing
 - Session 5: synthesizing
 - Session 6: Evaluating (The posttest will be included in this session.)
- “Students, continue your search...!”
- “All work on this unit must be completed in school (the library or your classroom).”

LESSON PLANS

(February: Black History Month)

A Heroic Heritage

(A library unit of study for grades 4, 5, and 6)

LESSON 5 of 6

Objectives

- Students will demonstrate their ability to use information accurately and creatively.
- Students will complete activities to celebrate the history, accomplishments, and contributions of African Americans.

Biblical integration

Ezra 5:8 NIV “The work is being carried on with diligence and is making rapid progress...”

Materials

- Activity packet for each student
- The Big6 Assignment Organizer
- Print media: books, encyclopedias, magazines, Children’s Magazine Guides, Dictionaries
- Computers: The World Book Multimedia Encyclopedia [CD-ROM], Encarta 98 [CD-ROM], the Internet, other reference materials available on the computers.
- Art supplies and paper as needed by students for their selected activities

Procedure

- Read Ezra 5:8 Emphasize the importance of keeping up with the time line established in step 5 of the Big6 Assignment Organizer.
- Reread step 5 (Synthesis) of The Big6 Assignment Organizer.
- “Students, continue your search...!”
- All work should be completed by the next session in which we will spend most of our time evaluating our work and the process.

LESSON PLANS

(February: Black History Month)

A Heroic Heritage

(A library unit of study for grades 4, 5, and 6)

LESSON 6 of 6

Objectives

- Students will demonstrate their ability to evaluate their work and the process used to achieve the work.

Biblical integration

Psalm 119:6a NIV “Teach me knowledge and good judgement,…”

Materials

- Activity packet for each student
- The Big6 Assignment Organizer
- Posttest

Procedure

- Read Psalm 119:6a. Emphasize that it is important to judge (evaluate) our work so that we can be confident that we are turning in our best work. Remember Colossians 3:23?
- Read step 6 (Evaluation) of The Big6 Assignment Organizer.
- Have students thoughtfully evaluate their activities in view of the questions in step 6. Only check off the ones that can be answered wholeheartedly ‘yes’.
- All work should be and ready to turn in.
- Give the posttest to all classes.

Information Literacy Skills

Pretest

Directions:

You will be asked to answer 10 multiple choice questions about *information literacy*—finding and using information. Circle one letter that best answers the question.

You will not be graded on this test, but you will want to do your best so that it can be determined how well you understand how to find information.

Circle the letter that best answers the question.

1. You have been asked to research an African American for black History month. Which of the following types of sources would you not use to find facts about Jackie Joyner-Kersey.

- a. A biography about Jackie Joyner-Kersey
- b. An encyclopedia article about Jackie Joyner-Kersey
- c. A fiction book in which Jackie Joyner-Kersey's name appears
- d. A magazine article about Jackie Joyner-Kersey
- e. I would look at all of them

2. To begin your research, which of the following activities would you do first?

- a. Make a list of questions I need to find answers to
- b. Plan how to conduct the research
- c. Locate all the information I can
- d. Decide which information is most useful
- e. Ask the teacher to help me find a book

Circle the letter that best answers the question.

3. You are considering Martin Luther King, Jr. as a possible subject for your research. If you choose the book *Martin Luther King: The Peaceful Warrior* by Ed Clayton (Prentice-Hall, 1964) as a source of information, which call number would you look for on the shelf?

a. B
 Mar

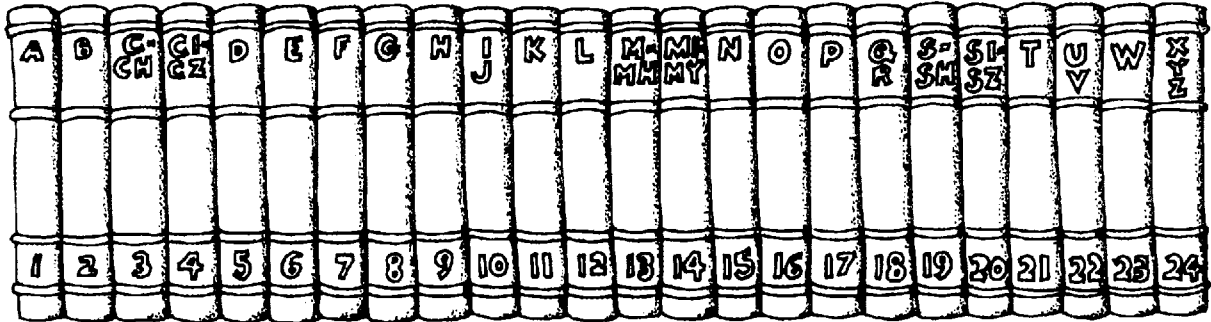
b. B
 Kin

c. B
 Cla

d. B
 Ed

e. None of the above

Circle the letter that best answers the question.



Note. Macmillan/McGraw-Hill School Publishing Company. *Assessment Test: Level M, Part 2, Form A.* 1991. New York: Macmillan/McGraw-Hill School Division. This illustration is reproduced with permission of The McGraw-Hill Companies.

4. In which volume of the encyclopedia pictured above would you look for information about Matthew Henson, an African American who accompanied Admiral Perry, the first person to reach the North Pole.

- a. 17
- b. 15
- c. 14
- d. 9
- e. None of the above

5. Using the set of encyclopedias pictured above, which of the following athletes would you find in volume 18?

- a. Jesse Owens
- b. Jackie Robinson
- c. Arthur Ashe
- d. Wilma Rudolph
- e. Both 'b' and 'd'

Circle the letter that best answers the question.

6. You have just found the book *One More River To Cross: The Story Of Twelve Black Americans* by Jim Haskins (Scholastic Inc., 1994). In which part of the book would you look to see if Rosa Lee Parks was mentioned?

- a. Table of Contents
- b. Glossary
- c. Index
- d. Both 'a' and 'c'
- e. None of the above

7. In doing this research, how will you record the information you find?

- a. use note cards
- b. use notebook paper
- c. use a chart or other graphic organizer
- d. any of the above would be OK
- e. none of the above would be good

8. You're thinking about making a poster that shows information about the life and accomplishments of Bill Cosby. How will you decide that a particular source of information, such as a web site or a book, is good enough to give you the information you need?

- a. consider the author
- b. consider the copyright
- c. consider the content
- d. consider other sources and compare
- e. consider all the above

Circle the letter that best answers the question.

9. You have gathered a lot of information from many sources. What should you do with all these sources when you finish the project?

- a. write a bibliography
- b. write a biography
- c. write a list of book titles
- d. nothing

10. What is the last step of a research project just before it is turned in?

- a. Proofread it (Is anything wrong...?)
- b. Evaluate it (Is it my best work and effort?)
- c. List sources of information (What materials did I use?)
- d. Ask the teacher when it's due (Am I late?)

The end.

Information Literacy Skills

Posttest

Directions:

You will be asked to answer 10 multiple choice questions about *information literacy*—finding and using information. Circle one letter that best answers the question.

You will not be graded on this test, but you will want to do your best so that it can be determined how well you understand how to find information.

Circle the letter that best answers the question.

- 1. You were asked to research an African American for black History month. Which of the following sources would you not have used to find facts about Jackie Joyner-Kersey.**
 - a. A biography about Jackie Joyner-Kersey
 - b. An encyclopedia article about Jackie-Joyner-Kersey
 - c. A fiction book in which Jackie Joyner-Kersey's name appears
 - d. A magazine article about Jackie Joyner-Kersey
 - e. I would look at all of them

- 2. To begin your research, which of the following activities did you do first?**
 - a. Made a list of questions I needed to find answers to
 - b. Planned how to conduct the research
 - c. Located all the information I can
 - d. Decided which information was most useful
 - e. Asked the teacher to help me find a book

Circle the letter that best answers the question.

3. You might have considered Martin Luther King, Jr. as a possible subject for your research. If you had chosen the book *Martin Luther King: The Peaceful Warrior* by Ed Clayton (Prentice-Hall, 1964) as a source of information, which call number would you have looked for on the shelf?

a. B
 Mar

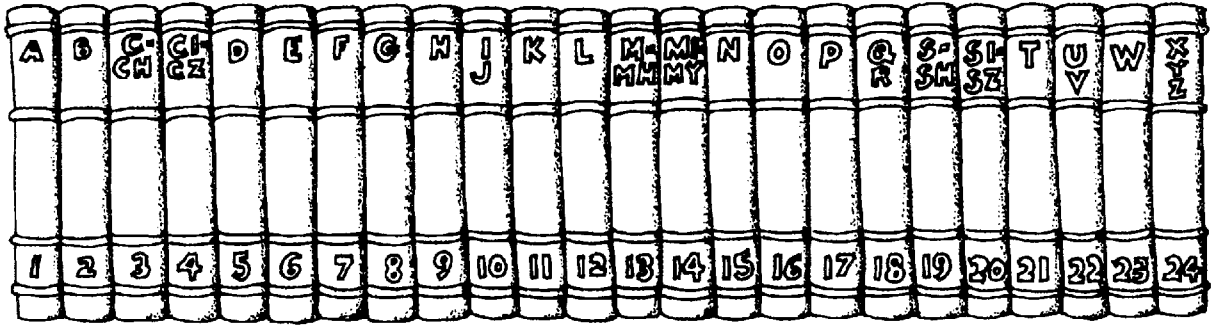
b. B
 Kin

c. B
 Cla

d. B
 Ed

e. None of the above

Circle the letter that best answers the question.



Note. Macmillan/McGraw-Hill School Publishing Company. *Assessment Test: Level M, Part 2, Form A.* 1991. New York: Macmillan/McGraw-Hill School Division. This illustration is reproduced with permission of The McGraw-Hill Companies.

4. In which volume of the encyclopedia pictured above would you have looked for information about Matthew Henson, an African American who accompanied Admiral Perry, the first person to reach the North Pole.

- a. 17
- b. 15
- c. 14
- d. 9
- e. None of the above

5. Using the set of encyclopedias pictured above, which of the following African Americans would you have found in volume 18?

- a. Ronald McNair
- b. Jackie Robinson
- c. Arthur Ashe
- d. Wilma Rudolph
- e. Both 'b' and 'd'

Circle the letter that best answers the question.

6. You have just found the book *One More River To Cross: The Story Of Twelve Black Americans* by Jim Haskins (Scholastic Inc., 1994). In which part of the book would you look to see if Rosa Lee Parks was mentioned?

- a. Table of Contents
- b. Glossary
- c. Index
- d. Both 'a' and 'c'
- e. None of the above

7. In doing this research, how did you record the information you found?

- a. use note cards
- b. use notebook paper
- c. use a chart or other graphic organizer
- d. all of the above
- e. none of the above

8. You thought about making a poster that shows information about the life and accomplishments of an African American hero. How did you decide that a particular source of information, such as a web site or a book, was good enough to give you the information you needed?

- a. consider the author
- b. consider the copyright
- c. consider the content
- d. consider other sources and compare
- e. consider all the above

Circle the letter that best answers the question.

9. You gathered a lot of information from many sources. What did you do with all these sources when you finished the project?

- a. wrote a bibliography
- b. wrote a biography
- c. wrote a list of book titles
- d. wrote a list of people
- e. did nothing

10. What was the last step of the research project you completed just before it was turned in?

- a. Proofread it (Is anything wrong...?)
- b. Evaluated it (Is it my best work and effort?)
- c. Listed sources of information (What materials did I use?)
- d. Asked the teacher when it was due (Am I late?)

The end.

The **Big 6** Assignment Organizer for Grades 3-6

Fill out Big6 #1-5 *before* you begin to work on your assignment.
Fill out Big6 #6 *before* you turn in your assignment.
You will need to print this form before exiting the page.

Name: _____

Today's date: _____ Class: _____



Big6 #1: Task Definition

What am I supposed to do?

What information do I need in order to do this? (Consider listing in question form.)

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____



Big6 #2: Information Seeking Strategies

What sources can I use to find this information?

1. _____

2. _____

3. _____

4. _____

5. _____

If using web sites, how will I know that they are good enough for my project?

I will use only those evaluated by and provided by my teachers.

I will use a web site evaluation guide



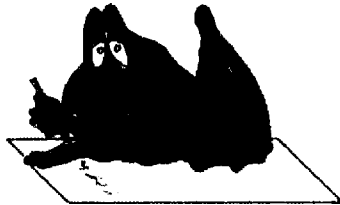
Big6 #3: Location & Access

Where will I find these sources?

- school library
- public library
- personal library
- provided by my teachers
- Internet
- other: _____

Who can help me find what I need?

- I can find the sources myself
- my librarian
- my teacher
- my parent(s)



Big6 #4: Use of Information

How will I record the information that I find?

- take notes using cards
- take notes on notebook paper
- take notes using a word processor
- take notes using a data chart or other graphic organizer
- illustrate concepts
- record into a tape recorder or use a video or digital camera
- other: _____

How will I give credit to my sources?

- use the guide given to me by my teacher
- use the Classroom Connect web site for citing Internet resources

use the Quick Guide for citing other resources



Big6 #5: Synthesis

How will I show my results?

- written paper
- oral presentation
- multimedia presentation | _____
- performance or | _____
- other: | _____

How will I give credit to my sources in my final product or performance?

- include a written bibliography
- after the performance or presentation, announce which sources I used
- other: | _____

Materials I will need for my presentation or performance (list, separating by commas)

How much time do I estimate it will take to find the information and create the product?

2-3 hours ▾

Timeline for assignment:

Ideas for project (task definition) completed by: _____

Information searching (note taking) completed by: _____

First draft due: _____

Completed assignment due: _____

Include here any additional information needed to successfully complete the

assignment:

--



Big6 #6: Evaluation

How will I know if I have done my best?

*Before turning in my assignment, I need to check off *all* of these items (on the printed Organizer):*

- what I created to finish the assignment is appropriate for what I was supposed to do in Big6 #1
- the information I found in Big6 #4 matches the information needed in Big6 #1
- credit is given to all of my sources, written in the way my teacher requested
- my work is neat
- my work is complete and includes heading information (name, date, etc.)
- I would be proud for anyone to view this work

[Back to home page](#)

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Librarian, Upper School, St. Andrew's Episcopal School, Austin, TX

Lecturer, The University of Texas at Austin, Graduate School of Library & Information Science

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1910

Beseen

Big6 Rubric for Assessment: A Heroic Heritage

Attribute Big Six Skills	Highly Competent	Competent	Adequate	Not yet Competent
#1 Task Definition	Articulates a clear, complete understanding of most of assignment/problem (2)	Demonstrates understanding of most of assignment or problem (1.5)	Shows vague, unfocused understanding of assignment of problem (1)	Is aware of assignment / problem (0.5)
#2 Information Seeking Strategies	Chooses the most appropriate strategy(ies) and gives reasons for choice(s) (4)	Chooses a strategy after comparing possibilities (3)	Chooses a strategy without comparison to other possibilities (2)	Is aware of different strategies (1)
#3 Location & Access	Locates and gathers materials independently / appropriately (4)	Locates and gathers materials with some assistance / appropriately (3)	Needs assistance. Missing some materials (2)	Needs assistance. Missing most materials (1)
#4 Use of Information	Completes activity with all components in evidence (4)	Submits activity with few components missing (3)	Submits activity with many components missing (2)	Is aware of assignment but has difficulty proceeding (1)
#5 Synthesis	Quality of the product reflects an understanding of most facets of the problem (4)	Quality of the product reflects an understanding of many facets of the problem (3)	Quality of the product reflects an understanding of some facets of the problem (2)	Quality of the product reflects an understanding of few facets of the problem (1)
#6 Evaluation	Evaluates the product and the problem-solving process and reasons without assistance (2)	Evaluates the product and the problem-solving process and reasons with assistance (1.5)	Understands evaluation process but gives few reasons with assistance (1)	Completes assignment but can't give reasons for errors in the product or problem-solving process (0.5)

	Evidence	Focus	Points Awarded
#1 Task Definition	Names selected activities	2	
#2 Information Seeking Strategies	Identifies strategies and reasons for...	4	
#3 Location & Access	Locates information / evaluates it	4	
#4 Use of Information	Notes & Bibliography Log	4	
#5 Synthesis	Project & Bibliography	4	
#6 Evaluation	Self-evaluation	2	
	Total Points	20	
		Grade: total points x 5 = % →	%

Note: Data in the top rubric are from "Integrated Problem Solving Model: Rubric for Assessment," by T. Little, retrieved January 18, 2000 from the World Wide Web: <http://es.houstonisd.org/ScrogginsES/information/library/planning.htm#6>

Note: Data in the bottom rubric are from "Big6 Assessment," by G. Schuhl, 1998, retrieved January 18, 2000 from the World Wide Web: <http://pop.apk.net/~gschuhl/assessment.htm>

Rubric for Library Media Specialist Role(s)¹

Group: _____

Date: _____

<i>Roles</i> Big Six Skills	A Instructor¹	B Coach¹	C Facilitator¹
#1 Task definition	Build awareness; Introduce & model strategies for selecting, developing, & refining topic	Monitor & provide feedback as students practice brainstorming, ...; Help students select topics independently	Suggest sources for topics; Consult as students develop questions about choices being made
#2 Information seeking strategies	Introduce information sources; model development of search strategy	Provide guidance as students develop search strategies; suggest specific resources for student topics	Help students develop individual search strategies
#3 Location and access	Demonstrate location of sources in media center, & location of information in sources	Give directions as students practice retrieving citations, locating sources, & using scanning & skimming techniques to find information	Assist as students locate information independently
#4 Use of information	Discuss criteria for evaluating relevance, reliability, & adequacy of information; demonstrate strategies for taking notes, explain rights and responsibilities of information use	Monitor & provide feedback as students apply criteria for evaluating & selecting or rejecting information	Consult as students assimilate, evaluate, select or reject information
#5 Synthesis	Introduce & model strategies for organizing information; describe format options for communicating results	Help students organize & synthesize information independently	Consult as students plan presentation of results; help students obtain & use required resources
#6 Evaluation	Discuss criteria for evaluating product & process; discuss how evaluation may suggest revisions	Provide direction as students apply criteria & suggest revisions; Provide feedback as students evaluate process & products	Consult as they make revisions

¹Note: From "Developing Information Literacy Through the Information Intermediary Process: A Model for Teacher-Librarians and Others," by K. T. Broek, 1994, *Emergency Librarian*, 22, p. 16

Juno e-mail printed Mon, 7 Feb 2000 18:17:09 , page 1

From: "Barbara A. Jansen" <bjansen@tenet.edu>
To: <dwcalvanico@juno.com>
Date: Sat, 5 Feb 2000 15:45:59 -0600
Subject: Re: Request for permission to use your Big6 Organizer for grades 3-6

Permission granted. Thanks for asking, Barb

Barbara A. Jansen
Lecturer, University of Texas at Austin,
Graduate School of Library & Information Science
Librarian, St. Andrew's Episcopal Upper School
5901 Southwest Parkway
Austin, TX 78735
512/452-5779 x287
bjansen@tenet.edu
bjansen@standrews.austin.tx.us
www.standrews.austin.tx.us/library

----- Original Message -----

From: <dwcalvanico@juno.com>
To: <bjansen@tenet.edu>
Sent: Saturday, February 05, 2000 2:56 PM
Subject: Fwd: Request for permission to use your Big6 Organizer for grades 3-6

> Dear Ms. Jansen,
>
> I am working on a Master's thesis. My topic has to do with computer
> skills and information literacy skills. I am just getting introduced
> to
> the Big6...
>
> For the unit I am doing with 4th and 5th grade in my library, my
> research
> part of the thesis, I would like permission to use your Big6 Organizer
> for grades 3-6 which I found on the Internet. I will, of course, cite
> it
> appropriately in the thesis.
>
> Thank you for considering my request.
>
> Sincerely,
>
> David Calvanico
> The King's Christian School
> Haddon Heights, New Jersey
> dwcalvanico@juno.com
>

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3 March 2000

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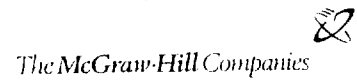
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