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The role of technology in the interactions between secondary school library media specialists and teachers

Shirley Benson McDonald
Louisiana State University and Agricultural and Mechanical College

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THE ROLE OF TECHNOLOGY IN THE INTERACTIONS BETWEEN
SECONDARY SCHOOL LIBRARY MEDIA SPECIALISTS AND TEACHERS

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
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in

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by
Shirley Benson McDonald
B. S., Louisiana State University, 1984
M.L.S., Louisiana State University, 1987
C. L.I.S, Louisiana State University, 1994
Ed.S., Louisiana State University, 2004
May, 2006

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ABSTRACT

Statewide studies of school library media centers in at least sixteen states (other than Louisiana) indicate that effective school library media center programs have a positive impact on student achievement. According to these studies, effective school library media centers have: (a) a qualified library media specialist, (b) adequate support staff, (c) current and large collections, (d) access to information technology that is integrated into the curriculum, and (e) time for collaboration with the faculty. This study was developed to explore the role of technology in the collaborations between school library media specialists and teachers. Data revealed that interactions between school library media specialists and teachers concerning the use of technology to teach information literacy skills occurred with frequency and in a variety of ways at the three selected exemplary school library media centers. However, barriers sometimes prevented collaboration from resulting. Climate in the school library media center was found to be crucial to collaboration and to the teaching of information literacy skills. Data indicated that technology should be only one of the tools used in teaching of information literacy skills to students, although computer literacy skills were perceived as increasingly important in this effort. According to the data from the surveys, interviews, and observations, teachers and administrators perceived the library media specialist to be the person with expertise in both technology and information literacy on their campuses, thereby necessitating involvement in continuing professional development. The findings of these best practices of technology interactions and the teaching of information fluency skills led to the formation of the Integrated Model of Information Fluency for Student Learning.

CHAPTER 1. INITIATING A CHANGE IN PRACTICE

Introduction

In the early 1990's, the researcher's high school library media center began its entrance into the technological age by purchasing one stand-alone computer with a modem and dial-up access to the Internet through Prodigy, one of the first consumer online subscription service providers offering access to the World Wide Web. How excited students and faculty were to be able to access an online encyclopedia that was updated so frequently! The principal was amazed at the easy access of up-to-date information not yet available in the print copies of the encyclopedia.

The addition of this one resource to the school proved to be a newsworthy event, resulting in the local newspaper's sending a reporter to the school library media center. A lengthy article on the front page of the "Living" section, complete with pictures of students using the computer, provided publicity to an event that was to change the way the researcher, the students, and the faculty gathered information. The library media center had officially entered the information- and technology-rich age. Now, with a computer lab networked and with Internet access provided through a T-1 line in the school library media center, the researcher looks back and wonders how anyone could ever have thought dial-up access to those few resources was so phenomenal.

Yet some things remain the same. The newspaper article quoted the researcher as saying that the job of a school library media specialist was not only to provide resources for students, but also to provide them with the skills necessary to make them lifelong learners. With so much information now available, teaching students to become information fluent has become even more vital.

Changing Role of School Libraries

The typical secondary school library collection of just a mere two decades ago consisted of books, periodicals, a few videocassettes, and perhaps a globe, a piece of art and/or maybe a sculpture or two. The shift from an industrial society to an information- and technology-rich society, however, has created an environment of unrelenting change for school library media specialists (Craver, 1994). Not only has it brought with it a new format for the presentation of information, but the advent of technology has also made available a vast amount of knowledge through online access to databases of information. Information overload has become common, with patrons often becoming confused and discouraged trying to navigate this information superhighway. According to Frank Worzel (cited in Olafson, 1999, Introduction),

> The phenomenon of information overload is in its infancy. If, according to some estimates, the amount of information doubles every 18 months, then by 2015 there will be 1,000 bits of data for every fact in existence. But we will not necessarily be better informed. Meaningful facts -- those that have reliable and relevant information -- will become our most valuable resource.

This increase in information, along with new technology developments occurring almost daily, makes it imperative that school library media specialists alter the traditional information services, beginning with the development of a vision of how the school library fits into the world of information and the teaching of information literacy skills. Libraries are no longer just repositories of books and printed materials, but libraries are the "people, materials, and machines that facilitate the use of information" (Mersky, 2002, p. 226).

Loertscher (2004, p. 56) describes his vision of a school library specialist who will have an effective program. This library professional will:

- Collaborate with teachers to build high-level learning experiences
- Build avid and capable readers
- Develop information-literate students
- Use technology to enhance learning.

<u>Challenges</u>

<u>Information Technology</u>

An informal study in Australia in 2001 (O'Connell, 2002) revealed that the most significant challenge librarians face is the impact of information technology. In little more than a decade, technology changes have allowed student access to digital multimedia, the Internet and other Web-based resources, discussion forums, chat-based reference and Web-accessible library collections. More and more information technology is being placed in the library, requiring the librarian to maintain and/or service the equipment and train users, often taking on new roles such as Webmaster, network administrator, professional development leader, and technology mentor to staff (Todd, 2001). It is essential for the librarian to have a thorough understanding of information seeking skills in this electronic environment (Branch & Oberg, 2001).

<u>Interaction</u>

School library media specialists make critical contributions to student learning through "cooperative planning and teaching, collection development and inservicing teachers" (Branch & Oberg, 2001, p. 9). For the most part, librarians place cooperative planning and teaching as a higher priority than teachers. Based on the researcher's own experience, it seems that neither pre-service nor practicing classroom teachers are traditionally trained to collaborate with librarians; therefore, the school library media specialist must take the initiative in this effort. Jo Ann Carr (1998) finds that although both K-12 professional organizations and higher education have recommended that

teacher education should include information literacy training, information literacy has not been integrated into preservice teacher education.

School library media specialists are also involved in providing professional development activities for teachers (Siminitus, 2002). According to Hayes (2003), the skills and talents of the school library media specialist can enhance site-based staff development.

School Library Media Center Impact

Students succeed where the library is an integral piece of the education program. The use of computers, online databases, and networks requires school library media specialists to become partners in the educational process as active participants in sharing ideas and knowledge (Craver, 1994). That school library media specialists have done this well is evidenced by recent studies showing that standardized test scores have risen as much as five to fifteen points in schools with effective library programs that address the teaching of information literacy skills (Ratzer, 2004). Research shows active school library programs that make a difference: (a) have a qualified librarian in the school library media center, (b) have adequate support staff, (c) contain current and large collections of resources, (d) provide access to information technology that is integrated into the curriculum, and (e) allow the school librarian time to collaborate with the faculty (Lance, 2002).

Data from studies in Colorado, Alaska, Florida, Pennsylvania, Iowa, Massachusetts, Michigan, Minnesota, Missouri, New Mexico, Ohio, Oregon, North Carolina, Texas, and Illinois (*School Libraries Work*, 2006) provide empirical evidence of a positive relationship between academic achievement of students and school library

media programs. Data used were standardized test scores, teacher-pupil ratio, per-pupil expenditures, and household income, taking care to consider the impact of socioeconomic conditions. Survey information from elementary and secondary schools provided details on staff, collections, monetary expenditures, and instructional methods (Hamilton-Pennell, Lance, Rodney, & Hainer, 2000). These correlational studies do not show a direct causal effect, but do provide strong evidence of a positive impact on student learning of an effective school library program (Eisenberg, 2004).

Just what are the librarians in these schools doing that makes a difference in the academic performance of their students? Professor Gary Hartzell traveled the country while he was with the national Library Power program, and he found that great school library programs have two key assets: an enterprising librarian who has the needed technical skills and a supportive principal who "allows the librarian time, resources, and encouragement to collaborate with other teachers, attend curriculum committees, and provide staff development" (Sherman, 2003, Beyond the Stats).

According to Lance (2002), the studies indicate that students show greater academic achievement when the school library media specialist and classroom teacher plan and teach collaboratively. He further states that the effective school library media specialist provides teacher training on resource-based learning, integrating technology, and managing networked technology. Most educators do not recognize the connection between effective school library programs and increased academic achievement because this connection has not been directly linked to student success at the local level. For this reason, local evidence-based studies that gather meaningful data need to be performed to document tangible outcomes of the impact on student achievement (Todd, 2003).

Gaps in the Research

Recent research (*School Libraries Work*, 2006) has established the positive impact that school library media centers have on student achievement when collaboration, leadership, and integrated technology are present. The impact, however, is a "complex interaction of variables that still need to be investigated further in terms of ascertaining how school library media centers help students learning more broadly" (Lonsdale, 2003b, p. 1). Lonsdale further points out that more research has been conducted at the elementary level than at the secondary level and that there is a lack of information on the models of the provision of school library service to teachers and students. Information is also lacking in the area of actual student use of the school library. Burks (as cited by Lonsdale, 2003a) found that assignments influenced use of the school library more than any other single factor. Data on the types of assignments being given to students could inform school library media specialists to more specific teaching of both students and teachers, as well as the purchasing of specific resources.

Interaction with Teachers

Technology does not replace teachers or school library media specialists, but rather changes the learning experience for students (Rosenberg as cited by O'Connell, 2002). Students learn how to connect information literacy skills with content area information through lessons developed through interactions between the librarian and teachers. The advent of information technology has strengthened the need for teacher/librarian interaction to integrate curriculum, technology, and standards (Cataldo, 2000). Although the literature indicates that technology and interaction with teachers and students are important, the literature does not explain how "electronic access to information facilitates

effective relationships" between and among librarians, teachers, and students (Lance, 2002, p. 9).

<center>Statement of Research Problem</center>

Access to information technology (networked computers with Internet access to reference sources) and collaboration of the school librarian and faculty in developing learning opportunities often result in increased student achievement (*School Libraries Work*, 2006). However, a gap exists in the information known about the connection of technology with the interactions between school library media specialists and teachers.

Todd (2001) suggests that local studies can provide the most useful evidence of the importance of the contribution of school library media centers to student achievement. He recommends micro-research studies using case studies, interviews, and survey questionnaires to gather useful and practical data. He further suggests "actions and evidences that show initiatives and energies make a real difference to student learning, that they contribute in tangible and significant ways to the development of human understanding, meaning making and construction knowledge" (p. 18).

The purpose of this research is to explore the interactions of school library media specialists and teachers as they use technology resources in selected school library media centers in southern Louisiana to determine whether or not the use of technology affects the interactions between school library media specialists and whether these interactions lead to collaborative lessons that teach information literacy skills. To explore best practices, the research will be conducted in three Louisiana secondary schools with exemplary school library media centers that provide access to information technology through networked computers that include access to the Internet, reference databases, and

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an automated library management system. Through (a) a survey of the members of a school library professional organization, (b) observations and interviews of school library media specialists, (c) interviews and a survey of teachers, and (d) interviews of administrators, the collaborative activities and use of technology by school library media specialists will be studied to explore the role of information technology on the interactions of librarians and teachers in the planning and teaching of information literacy skills through student research assignments.

Significance of the Study

National and state educational goals include student learning of information literacy and technology skills (AASL, 1998; Louisiana State Department of Education, 2004; International Society for Technology in Education, 2004). School library media specialists are faced with the responsibility of this task (Arnone, Small, & Hardy, 2003). A push toward high stakes testing and the more recent No Child Left Behind Act on the federal level means that schools are looking for methods to increase student performance in those all-important standardized test scores. The school library impact studies that began with the Colorado study of Keith Curry Lance in 1993 and that now include data from sixteen states (*School Libraries Work*, 2006) suggest that an effective school library program can raise standardized test scores. The studies look at student access to electronic information and collaboration of school library media specialists with teachers (among the many other variables such as staffing, resources, and funding), so they provide a background of information to support this research. An exploration of current practices by school library media specialists in the use of information technology for student research projects will add to the knowledge base, as well as provide information

on the efforts of librarians to promote interactions with teachers regarding the use of technology in educational activities.

Although this study is limited to three schools and the membership of one professional organization, the findings will provide information to support a change of practice in the use of the information technology in school library media centers. An additional benefit of such a study would be to utilize the resulting data to plan and implement effective professional development programs that teach ways of fostering effective interactions between school library media specialists and teachers to increase student proficiency in locating, accessing, evaluating, and presenting information.

<u>Research Questions</u>

School library media specialists have typically found that technology has created more opportunities for interactions with the faculty, although these interactions do not always result in information literacy lessons (D. Henson, personal communication, October 13, 2004). The central question to be addressed in this study is: What are the interactions of school library media specialists and teachers associated with the use of information technology? Sub questions to be addressed are:

- What is interaction as perceived by school library media specialists? By teachers?
- What interactions are created or encouraged by information technology?
- What is the contextual climate of the interactions?
- What is the frequency of interactions between the school library media specialist and the teachers? In what content areas?
- What are the ways that technology is being used to teach information literacy skills to students?

<u>Limitations of the Study</u>

This case study was limited to three sites in three parishes of southern Louisiana; therefore, the results may not be generalizable to a larger geographical area. Limited to the secondary level (grades 9-12), the results of the case study may not be generalizable to the elementary or middle school level. The sample was chosen from exemplary school library media centers that nevertheless represent the larger population. Since a survey instrument that gathers the descriptive data needed for this study does not exist, the researcher created one. Thus, the validity and reliability of the entire instrument has not been established. However, the survey was piloted before the actual study. Another limitation is that the survey information is self-reported and subject to participant bias.

<u>Definition of Terms</u>

For the purposes of this study, the following pertinent definitions are listed:

Automated library management system: computerized circulation program, cataloging program, and card catalog access.

Channel One – a commercial enterprise that provides television equipment to schools in exchange for the school's showing the daily broadcast of two minutes of advertising and ten minutes of news to its students.

Collaboration – formal or informal planning of lessons based on curriculum.

Core subjects – English, math, science, social studies; those subject areas tested by Louisiana's Graduate Exit Exam (GEE21).

Curriculum – all of the courses taught at a specific educational institution.

Database – a digitized file of information that is regularly updated and related to a specific subject or field.*

Graduate Exit Exam (GEE21) – standardized criterion high stakes test which secondary students in Louisiana must pass with a specific proficiency before graduating high school.

Information fluency – ability to combine information literacy and technology skills with critical thinking skills to solve an information need.

Information literacy – ability to recognize an information need and to locate, evaluate and effectively use the information.

Information need – a gap in a person's knowledge that leads to a search for an answer.*

Information technology – hardware and software that provides information resources.

Inservice - a planned experience or activity designed to develop competencies or increase knowledge.

Interaction – communications, contacts, exchanges; reciprocal action.

Local area network (LAN) – a communications network, often within one building or a group of buildings (such as a local school or college).*

Magnet high school – a public school offering a specialized curriculum, often with high academic standards, that allows students outside the geographic attendance area to enroll.

Network – computers connected through a local area network (LAN).

Parochial school – a private school run by a religious group organization.

School Performance Score – the label describing a school's level of performance based on its Baseline School Performance Score (SPS). These are designated as five star (SPS of 140 or higher), four star (SPS of 120 – 139.9); three star (SPS of 100.0 – 119.9); two star (SPS of 80.0 – 99.9)); one star (SPS of 60.0 – 79.9); academic warning (SPS 45.0 – 59.9); academically unacceptable (SPS below 45). ***

Professional development – ongoing learning activities that train the faculty to utilize resources and tools to teach their students more effectively and efficiently.

Secondary school – grades 9-12 (often called high school).

T1 – a dedicated digital circuit provided by telephone companies that can transmit data at the rate of 1.544 megabits per second, with 24 individual channels that can each transmit data at 64 kilobits per second.*

Technology integration - the incorporation of technology resources and technology-based practices into the curriculum of a school.**

*adapted from *Online Dictionary for Library and Information Science* (Reitz, 2004)

**adapted from *Technology in Schools: Suggestions, Tools, and Guidelines for Assessing Technology* (National Center for Educational Statistics (NCES, 2003)

*** Louisiana Department of Education, School Report Card for Principals

CHAPTER 2. REVIEW OF RELATED LITERATURE, MAKING CONNECTIONS

Discussion of the positive impact that effective school library programs have on student achievement is prevalent in library literature, including at least sixteen empirical statewide studies involving hundreds of schools. All of these "impact studies" resulted in data that show the "provision of information and information services makes a difference to the lives of people" (Todd, 2003, p. 3) through a well-planned and effective school library media program. In addition, Ratzer (2004) cites an ASCD report and a NCTE study that correlates an eight percent to fifteen percent improvement in reading scores with effective school library media programs.

According to Todd (2003), the role of the school librarian must be an "explicit, systematic and planned pedagogical intervention" (p. 4), with the school library media specialist actively collaborating with teachers to produce the desired outcomes. New technologies in the information society require an inquiry-based learning environment in which students can learn to manage information. In order for this to happen, the teacher (content expert) and school librarian (resources and process expert) must collaborate in "planning, teaching, and evaluating student learning across the curriculum" (Kulthau, 2001), utilizing all of the available resources - print, nonprint, and electronic- in a constructivist approach. According to Loertscher (2000), collaboration, reading literacy, enhancing learning through technology, and information literacy comprise the major programs of a school library media program.

<u>Media Debate</u>

Over the last couple of decades, schools have made significant monetary investments in technology: facilities, equipment, software, training, staff development,

and upgrades. The question of whether or not the technology is worth this investment has been, and is still being, debated. Fleming and Raptis (2000) conducted a topographical analysis of the research from 1990-1999. Their study found that (a) only 25% of the educational literature was empirical research, (b) 25% was discussion/opinion, (c) only 6% studied the attitudes and opinions from the student perspective, and (d) 44% of the articles described multimedia use in specific institutions and specific learners. The authors conclude that while anecdotal evidence asserts positive effects on student learning, empirical evidence does not justify the cost of technology. A case study by Larry Cuban (2001) of classrooms in Silicon Valley found no substantial evidence that using information technology increased students' academic achievement.

Richard Clark contends that media are merely the vehicles that "deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in our nutrition" (Clark, 2001, p. 2). Kozma (Clark, 2001) takes issue with Clark, stating that both medium and method are part of the educational design and that students can utilize media to construct knowledge. In a recent international study, Kozma (2003) investigated the use of technology by teachers and students. The data from the observations that focused primarily on student Internet projects suggest that students are using technology to collaboratively "search for information, publish results and create products" (p. 13).

However, some recent correlational studies indicate that technology is beneficial to the education of students. Integrating the technology into the curriculum with carefully selected software aligned with content-area standards provides the greatest impact on student achievement (Cradler, McNabb, Freeman, & Burchett, 2002). An extensive study

of 55 New York State school districts involving 4,041 teachers, 1,722 students, 159 principals, and 41 superintendents concluded that increasing the use of technology encourages student achievement. Gains in student academic achievement were also found in schools and districts with differing policies and of various sociodemographic backgrounds (Mann & Shafer, 1997). Data from a study of the statewide West Virginia Basic Skills/Computer Education technology implementation also points to the positive educational impact of technology. This data indicate that at least 11 % of the reason for the increase of student scores was linked to Basic Skills/Computer Education (Mann, Shakeshaft, Becker, & Kottkamp, 1999). An analysis of 176 research reviews by Bialo and Sivin-Kachala (1996) found a significant positive effect on student achievement. They also found that the development of information skills was a factor in this achievement and that attitudes and self concept about learning were also positively affected by technology. Data from a study of computer use and mathematics achievement by Wenglinsky (1998) suggest a positive correlation was dependent on the computers being used to teach higher-order skills.

Technology, therefore, must be integrated into the curriculum and into the library program for it to be a successful educational tool. Loertscher & Achterman (2003, p. 97) summarize the research on the expected benefits of technology for learners and teachers, as shown in Table 1.

Recent literature (National School Boards Association, 2004) points out that the goal of education is not simply to increase standardized test scores, which provide only limited information about successful learning. Loertscher (2000) asserts that "one of the primary arguments made for equipping each child and teenager with technology skills is

Table 1. Benefits of Technology (Loertscher & Achterman)

Expected Benefits of Technology for Learners	Expected Benefits of Technology for Teachers
Affecting what they know: o Enhancing their ability to grasp and retain concepts o Enlarging their knowledge base	Affecting what they teach o Enhancing the sophistication and amount taught o Enabling the teaching of a full range of state standards
Affecting what they can do o Building their efficiency o Enhancing their *information literacy* o Enhancing their productivity o Building their skills for the world of work o Connecting them to a quality information-rich environment at the elbow	Affecting how they teach o Enhancing the ability to reach every learner o Assisting in management of classroom operations o Diversifying role, location, and time
Affecting their attitude o Engaging them as learners	Affecting their expectations of learners o Expecting learners to learn more in less time o Responding to higher student engagement

that most jobs nowadays require some technology sophistication" (p. 134). His model of the potential impact of technology on education details the areas of (a) building technology tools, (b) encouraging process skills, (c) delivery of quality resources, and (d) building content knowledge. Advocating "just-in-time instruction" (p. 136), Loertscher asserts that integrating information literacy and technology skills into the classroom instruction is more effective than isolated skills teaching.

An information-rich and technological society demands strong technology as well as problem solving skills, and educators should prepare students for lifelong learning and the tasks required to succeed in a technology-rich work place. This is an area in which the expertise of the school library media specialist can be of particular importance, not only by training teachers on technology skills, but also by teaching them how to incorporate

technology into their curriculum. Indeed, school library media specialists are involved in technology at their schools. According to a survey by *School Library Journal* (Brewer & Milam, 2005) of 1,571 school library media specialists from 50 states, 48% of elementary school media specialists responded that they collaborate with their teachers to integrate technology into the curriculum. Only 36% of the high school respondents indicated the same. Ninety-five percent of the respondents instruct students to locate information using electronic resources. More than two-thirds of the respondents are on the technology committees at their schools, and 30 % are on their district technology teams. In addition, 84% of media specialists who responded to the survey are providing technology staff development to their teachers. With the responsibility of professional development, school library media specialists are finding models of technology adoption and diffusion helpful to understand the progress, or perhaps the non-progress, of their faculty.

Diffusion

Everett Rogers (2004) describes diffusion as "the process through which an innovation, defined as an idea perceived as new, spreads via certain communication channels over time among the members of a social system" (¶2). His Diffusion of Innovations model (Wilson et. al., 2000) moves linearly in these five stages: Knowledge, Persuasion, Decision, Implementation, Confirmation. Rogers classifies the users of an innovation into these groups: Innovators, Early Adopters, Early Majority, Late Majority, and Laggards (as cited by Wilson, et. al., 2000). The Concerns-Cased Adoption Model (CBAM) described by Hall and Hord (Anderson, 1997) lists seven Stages of Concern: Awareness, Informational, Personal, Management, Consequence, Collaboration, and Refocusing. CBAM also addresses the Levels of Use, which are listed as: Non-use,

Orientation, Preparation, Mechanical Use, Routine, Refinement, Integration, and Renewal.

The preferred goal for technology use in educational settings is for colleagues to reach a level of use that will allow the user to integrate the technology into the classroom lessons. Christiansen (1997) adapted a state of learning from Russell to come up with the Stages of Adoption of Technology model that has these stages that can be used with almost any technology: Awareness, Learning the Process, Understanding and Application of the Process, Familiarity and Confidence, Adaptation to Other Contexts, and Creative Application to New Contexts.

<u>Technology in the Library</u>

The library often is one of the most technologically-rich places in a school (Logan, 2001). The use of resources provided by technology changes the learning environment from providing just a few information resources to providing access to so many materials that it can easily become an overload of resources. School library media specialists have the task of organizing this information overload and providing users with the tools and knowledge with which to access the resources, thus becoming a facilitator of learning rather than a transmitter of knowledge (Arp & Woodward, 2002). Often technology change is viewed as simply integrating a new technology (Dusky, 2001). However, technology is only a tool to facilitate learning, teaching, information access, and delivery activities (Bland, 2002), with the actual change in the minds of those using the technology (Dusky). The role of technology in education has been debated for years; however, the following studies empirically establish its importance to the school library program.

A national study (Center for Applied Special Technology, 1996) on the role of online communications in schools indicates that students with online access to information sources perform better. The work of 500 students in fourth and sixth grade classes in seven urban school districts in various parts of the United States (half with online access and half without) was compared. All classes were encouraged to use multimedia reference materials, but only the experiment classes were allowed to use online resources. Those students with online access showed significantly higher scores managing, communicating, and presenting ideas.

Texas. A study (Smith, 2001) of 600 Texas school library media centers was conducted, and the data from the school library program was supplemented with data on school characteristics and student performance on the Texas Assessment of Academic Skills (TAAS). In examining the relationship between libraries and TAAS performance, over 200 school, library, and community variables were used. The study collected a wide range of data on technology resources in libraries. Technology variables identified as being positively and highly correlated include:

- Computers in or under the library's supervision
- Library computers with Internet access
- Library computers with access to the library catalog
- Library computers with access to the library's databases
- Library computers with CD ROM drives
- Library computers with networked access to CD ROM resources.

The bivariate correlation coefficiences of these variables increased with

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educational level (Smith, 2001). The findings of this study emphasize that effective use of technology resources in the library has a positive impact on higher student achievement.

Pennsylvania. Another empirical study was conducted by Lance, Rodney, & Hamilton-Pennell (2000b) of 435 Pennsylvania schools, with each of the three grades (5, 8, 11) in the sample being treated as distinct samples. Correlations between the Pennsylvania System of Student Assessment (PSSA) and information technology access in the library were greatest at the fifth grade level. The study further concluded that higher PSSA reading test scores were linked to the numbers of computers giving access to the ACCESS PENNSYLVANIA database, other licensed databases, and the Internet/World Wide Web. This study also supports the findings that technology in the library has a positive impact on student achievement.

Alaska. A recent study of school library media centers in 211 Alaska public schools during 1997-98 included surveys to assess the impact on academic achievement. A limitation of this study is that the schools were self-selecting. The data on technology showed that almost 75 % of schools with Internet-accessible computers in the library media centers were among the higher-achieving schools. A positive and statistically significant relationship was found between higher CAT5 test scores (grades 5, 8, 11) and schools with telecomputing capabilities (Lance, Hamilton-Pennell, Rodney with Petersen & Sitter, 2000).

Colorado. These findings have been corroborated by another statewide study called the "second Colorado study" (Lance, Rodney, & Hamilton-Pennell, 2000a); this study also found test scores increased with access to networked computers, especially when

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Internet, World Wide Web access, and licensed databases were available. Thus, two more statewide studies, both the Alaska and Colorado studies, resulted in data that connects the use of technology in the library with higher student achievement.

Massachusetts. Questionnaires were mailed out (one to every public school) to school library media centers in Massachusetts. Among the findings of this study was that at the high school level, higher average scores on the Massachusetts Comprehensive Assessment System was found at schools with automated collections (Baughman, 2000).

Iowa. A study of self-selected Iowa public school library media centers which included data from 169 fourth grade classes, 162 eighth grade classes, and 175 eleventh grade classes found that the strongest correlations with student achievement were for library computers linking to the school or district home page and library databases (Rodney, Lance, & Hamilton-Pennell, 2002).

North Carolina. A total of 216 schools were studied through questionnaires sent to North Carolina school library media centers. This study found a statistically significant correlation between expenditures on electronic access to information and student achievement. Also of significance was the finding that school library media centers in the high-performing schools were twice as likely to subscribe to CD ROM services as were those in the low-performing schools (Burgin, Bracy, & Brown, 2003).

Ohio. Data from 13,123 students in thirty-nine schools with effective school library programs in Ohio revealed that technology ranked higher than reading in their perception of what is important in their libraries, commenting on its importance to information access (Whelan, 2004). In fact, 84.9% responded that computers in the school library helped them to do their school work better, and 94.3% responded that the school library

is effective in providing them with effective Internet searching strategies, as well as evaluating information (Todd & Kuhlthau, 2004).

Oregon. Lance, Rodney, and Hamilton-Pennell (2001) in their summary of the data from Oregon's *Good Schools Have Good Librarians* study suggest that successful school library programs have:

- o Diverse collections in multiple formats
- o Information technology that extends throughout the school and provides access to the library catalog, licensed databases, and Internet access.

Florida. Baumbach (2002) used data from 1,715 surveys of Florida's public schools, along with data from standardized test scores and demographic data, to study the impact of school libraries. The results show that high school student scores from the Florida Comprehensive Assessment Test (FCAT) are higher when:

- o There are more visits to the library media center to use technology.
- o There are more networked computers in the school and more computers with Internet access.
- o There are more computers in the library media center and more computers have Internet access.

Furthermore, for high schools that scored in the top third of the FCAT, there were

- o 50% more computers in the school library media center
- o 42% more library media center computers connected to the Internet.

New Mexico. According to data from this study, "school library development alone accounts for 7.9 % of variation in average achievement scores among high schools"

(Lance, Rodney, & Hamilton-Pennell, 2002, p. vii). The study found that scores of tenth

grade students improved with the availability of library computers with Internet and card

catalog access. Achievement scores also improved when students visited the school

library more, and the library was visited more often when the students had access to more

library computers with Internet and card catalog access.

Minnesota. Responses from 1,172 schools to the School Library Media Program

Project Census and site visits to 131 elementary and secondary schools provided data for

a study of Minnesota's school library program (Baxter & Smalley, 2003). The census

findings show that the number of networked computers in the school library media

center, access to databases from home, and whether or not the library has an automated

card catalog is affected by school size. Site visit findings show that curriculum "drives

the technology investment" (p. 12) when professional media specialists plan with

teachers to use technology. District level technology integration support was beneficial in

ensuring that the technology was effectively used to increase student learning. Qualitative

data from the site visits revealed that the use of technology has added to the workload of

the school library media specialist, reducing the time that can be used to teach students.

Another theme discovered through this data supports the premise that technology by itself

will not increase academic achievement. School library media specialists and teachers

must "integrate the technology meaningfully into the curriculum" (p. 77) and school

districts must invest in training in this area.

California. Noting that high stakes testing is driving California school districts to

search for methods of improving student achievement, SBS Pacific Bell under the

direction of Jackie Siminitus (2002) studied California's public K-12 schools through

telephone interviews with curriculum leaders. The top technology issue discussed by respondents was quality of service, followed by professional development activities and technical support. Also of note was that often the school library media specialist becomes the technical support for the school's computer workstations. The curriculum leaders indicated that high school library media specialists were instrumental in teaching students to become more effective in their research, as well as more responsible in their Internet use.

Michigan. A six-page questionnaire was returned by 38.1% of the school library programs that served eleventh grade students (Rodney, Lance, & Hamilton-Pennell, 2003). The findings on technology and high school libraries include:

- o Hands-on technology experiences can be the key to learning
- o Supporting computer networks and planning with teachers are the activities of high school librarians most strongly linked with the availability of more computers in the library and elsewhere in the school
- o With only a few exceptions, schools with better test scores have more extensive and sophisticated computer networks extending the reach of the school library.

Missouri. Data collected from 782 participating schools in Missouri to study school library media centers and their impact on student learning show a 10.6% statistically significant impact (Miller, Want, & Whitacre, 2003). The three components that had a statistically significant impact were usage, summer reading program, and access. Since online and print resources impact both access and usage, it was concluded that school library media centers should provide a wide variety of these resources.

Illinois. A survey of 657 Illinois school libraries provided data that shows higher average test scores on the Illinois Standards Achievement Test (ISAT) were associated with a higher Internet computer/student ratio (Lance, K., Rodney, M., & Hamilton-Pennell, 2005). In fact, the data reveal that the "presence of more library computers is associated with percentage increases of almost 11 % for eighth- grade ISAT writing performance and just over 5 % for eleventh-grade ACT scores" (page ix).

Collaboration and Information Literacy Skills

In a review of the literature on teacher/school library media specialist collaboration, Lindsay (2004) found these themes: (a) students need information literacy skills taught jointly by teachers and teacher-librarians; (b) teachers and principals know little about information literacy; (c) integrating information skills into the curriculum requires the leadership of the principal and the support of teachers; and (d) trust of teachers, principals, and teacher-librarians is essential.

Just having access to technology is not enough. Several studies (Todd, 2001) indicate that students often have problems effectively connecting with, interacting with, and utilizing information, such as effective use of search engines and evaluation of Web site information for accuracy, currency, and authority. Technology must be integrated into the information literacy curriculum for it to be effective in teaching students to become lifelong learners and to know how to find the answers to their information needs.

Information Literacy

Information Power: Building Partnerships for Learning (American Library Association, 1998, p. 8, 9) lists nine literacy standards that are essential for student learning (see Table 2).

Table 2. Literacy Standards for Student Learning

Information Literacy	*Standard 1*: The student who is information literate accesses information efficiently and effectively. *Standard 2*: The student who is information literate evaluates information critically and competently. *Standard 3*: The student who is information literate uses information accurately and creatively.
Independent Learning	*Standard 4*: The student who is an independent learner is information literate and pursues information related to personal interests. *Standard 5*: The student who is an independent learner is information literate and appreciates literature and other creative expressions of information. *Standard 6*: The student who is an independent learner is information literate and strives for excellence in information seeking and knowledge generation.
Social Responsibility	*Standard 7*: The student who contributes positively to the learning community and to society is information literate and recognizes the importance of information to a democratic society. *Standard 8*: The student who contributes positively to the learning community and to society is information literate and practices ethical behavior in regard to information and information technology. *Standard 9*: The student who contributes positively to the learning community and to society is information literate and participates effectively in groups to pursue and generate information.

All nine of the standards contain the phrase "information literate" (p. 8), emphasizing the importance of one's "ability to find and use information" (p. 1), which is the American Library Association's definition of information literacy. Information today is abundant and easily accessed, so finding resources to meet information needs is not always difficult. However, users of these resources are often overwhelmed when they try to select, organize, analyze, apply, and present the information to answer an information need. Sometimes information literacy skills are taught separately from other curricula in schools or just added on to the English/Language Arts curriculum. However, Haycock (2002) suggests that school library media specialists should "translate librarian-ese into the specific language of each discipline" (p. 21). That many students are not being taught adequate information skills is evidenced by a comment from a university preservice

teacher's comment after an information literacy project described by Asselin and Lee (2002): "I wish someone had taught me how to develop my information literacy skills through resource-based learning in these ways in school. I might not have had such a horrendous time of it when I came to university" (Introduction).

Models. There are many research models in existence that provide guidance in teaching students to effectively utilize the available information. One of the most widely known is the Big6 model (Eisenberg, 2003), developed by Eisenberg and Berkowitz. This model divides the process into six steps, which are:

> **Task Definition**
> 1.1 Define the information problem
> 1.2 Identify information needed
>
> **2. Information Seeking Strategies**
> 2.1 Determine all possible sources
> 2.2 Select the best sources
>
> **3. Location and Access**
> 3.1 Locate sources (intellectually and physically)
> 3.2 Find information within sources
>
> **4. Use of Information**
> 4.1 Engage (e.g., read, hear, view, touch)
> 4.2 Extract relevant information
>
> **5. Synthesis**
> 5.1 Organize from multiple sources
> 5.2 Present the information
>
> **6. Evaluation**
> 6.1 Judge the product (effectiveness)
> 6.2 Judge the process (efficiency)

Carol Kuhlthau (2004) calls her model The Information Seeking Process (ISP) and divides the research process into seven steps, with each step addressing feelings, thoughts, and actions. According to Milam (2004), Kuhlthau's process applies the

constructivist theory and emphasizes building on prior knowledge. She lists these steps

as: (a) Initiating a topic, (b) Selecting a topic, (c) Exploring information, (d) Forming a

focus, (e) Collecting information, (f) Preparing to present, and (g) Assessing the process.

David Loertscher's Information Literacy Model (Loertscher, 2000, p. 159) is a non-

linear process. His model begins with the student questioning and wondering, then

moving through the steps of finding and sorting, consuming and absorbing, thinking and

creating, summarizing and concluding, communicating, and reflecting on the process and

the product. Since it is a non-linear model, students move between and among the steps

throughout the process.

Jamie McKenzie (1997) created The Research Cycle to "meet the need for a more

robust approach to school research which would involve teams of students working on

essential questions" as shown in Figure 1.
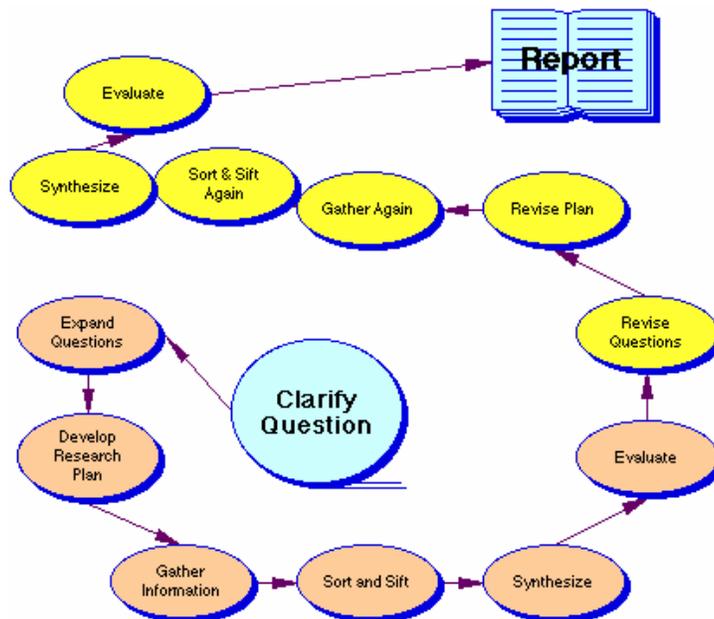
Reprinted with Permission
from Jamie McKenzie

Figure 1. The Research Cycle by Jamie McKenzie

The *Guidelines for Library Media Programs in Louisiana Schools* (2004) includes

the Louisiana Information Literacy Model for Lifelong Learning, sometimes called the

"Louisiana Seven." Designed to be integrated into the curriculum in all content areas, this framework is an effort to produce "independent lifelong learners" (p. 70). The seven steps are:

1. **Defining/Focusing**: The first task is to recognize that an information need exists. Students make preliminary decisions about the type of information needed based on prior knowledge.
2. **Selecting tools and resources**: After students decide what information is needed, they then develop search strategies for locating and accessing appropriate, relevant sources in the school library media center, community libraries and agencies, resource people, and others as appropriate.
3. **Extracting and recording**: Students examine the resources for readability, currency, usefulness, and bias. This task involves skimming or listening for key words, chunking, reading, finding main ideas, and taking notes.
4. **Processing information**: After recording information, students must examine and evaluate the data in order to use the information retrieved. Students must interact with the information by categorizing, analyzing, evaluation, and comparing for bias, inadequacies, omissions, errors, and value judgments. Based on their findings, they either move on to the next step or do additional research.
5. **Organizing information**: Students effectively sort, manipulate, and organize the information that was retrieved. They make decisions on how to use and communicate their findings.
6. **Presenting findings:** Students apply and communicate what they have learned (e.g., research report, project, illustration, dramatization, portfolio, book, book report, map, oral/audio/visual presentation, game bibliography, hyper stack, etc.).
7. **Evaluating efforts:** Throughout the information problem-solving process, students evaluate their efforts. This assists students in determining the effectiveness of the research process. The teacher and also other qualified or interested resource persons may evaluate the final product.

Barriers. According to a four-page questionnaire from 783 school library media specialists (Whelan, 2003), the biggest barrier to information literacy in the curriculum is the lack of buy-in and support from teachers (64%). This was followed by a lack of understanding in general about the educational efficacy of information literacy (59%), by students not motivated to act because information literacy is not part of their grade (44%), and by a lack of support from the principal/administrator (29%). Twenty-five

percent of the respondents listed "other," and the author does not elaborate on this category.

  Suggested Activities. In their empirical study, Schroeder and Zarinnia (2002) suggest that teams of teachers and librarians can collaborate through problem-based learning to develop information literacy skills. Their project concentrated on grades six, seven, and eight, with about fifty teachers and librarians participating. One of the goals was to examine the role of the librarian in the information problem-solving process and the technology skills associated with it. Since technology lends itself so well to collaborative activities, this area provides opportunities for librarians to intervene through collaborative activities that address information literacy. Schroeder and Zarinnia state that the "interaction between teachers and library media specialists in the design of curriculum is delicate and requires trust, acceptance and mutual respect" (p. 55). According to Ken Haycock (2001), these studies show that the more effective means of impacting student achievement is course integrated instruction with a school librarian who is (a) certified, (b) trained in collaborative methods, (c) an equal teaching partner, and (d) active in the instructional program.

Information Fluency

  According to Annette Lamb (2004b), a technology-rich environment means that educators must change from teaching information literacy skills to ensuring that students are information fluent. She uses the analogy of a keystone to produce The Technology Keystone method of promoting information fluency, based on three components: Thinking (critical, creative, content area, metacognition), Reading (formats and type), and Technology (tools and approaches) as shown in Figure 2.

Reprinted with permission from Annette Lamb

Figure 2. Information Fluency Model by Annette Lamb

As cited on the Eduscapes Web site (2004a), Annette Lamb quotes Danny Callison's definition of information fluency as "the ability to apply the skills associated with information literacy, computer literacy, and critical thinking to address and solve information problems across disciplines, across academic levels, and across information format structures" (¶ 1). As shown in Figure 3, Danny Callison has developed a model for Selected Interactions and Relationships Defining Information Fluency.

The Associated Colleges of the South Information Fluency Project Task Force Report (2000) defined information fluency as the "optimal outcome when relevant computing skills are combined with information literacy and critical thinking skills" (p. 8). This model describes information fluency as the place where information literacy, computer literacy, and critical thinking skills overlap, as shown by Figure 4.

The Illinois Mathematics and Science Academy defines 21st Century Information fluency as a "combination of aspects of Information Literacy and Technology Literacy that people need to locate, evaluate and use digital information resources efficiently and effectively" (Illinois Mathematics and Science Academy, 2004). Their model creates twenty-seven categories from a cube comprised of attitudes, skills, knowledge, locating, evaluating, integrating, resources, strategies, and tools.

A pilot program at Washington and Lee University (Overholtzer and Tombarge, 2003) integrated information fluency instruction into a Quantitative Models course

Need Analysis:
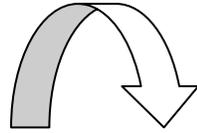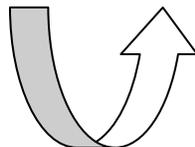
- Academic
- Personal
- Workplace

Critical
Thinking

Literacy Skills:

- Computer
- Information
- Media/Mass Communication
- Reading/Writing/Speaking

Learning Techniques:

- Guided
- Student-centered
- Constructivist

INFORMATION
FLUENCY

Strategy Selection from Models:

- Problem-solving
- Human sources/ personal
- In-depth information search process
- New questions & inquiry

Evaluation Levels:

- Formative or summative
- External or internal personal
- Written, spoken, recorded
- Checklist, journal, portfolio

Creative
Thinking

Communication Levels:

- External audience or internal self
- Entertain or inform

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Figure 3. Selected Interactions and Relationships Defining Information Fluency

and found that the final projects in the class were superior, with the lower end of the

projects showing a marked difference. Another finding was that the students were less

anxious about the projects than usual for the assignment. Information technology has, in

the experience of the researcher, increased the need for librarians to collaborate with

other educators in order to successfully teach information literacy and information

fluency skills. Integrating this instruction into the curriculum also requires collaboration

between the school library media specialist and content area teachers.
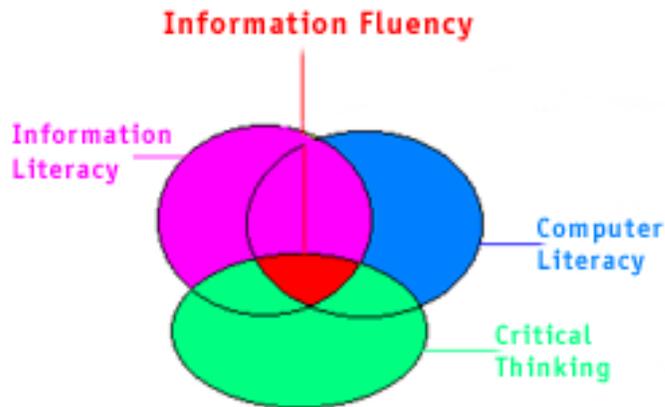
Figure 4. Information Fluency Model by Associated Colleges of the South

Interactions between School Library Media Specialists and Teachers

According to *Information Power* (AASL & AECT, 1998), the effective school

library media specialist collaborates with members of the learning community to

"analyze learning and information needs, to locate and use resources that will meet those

needs, and to understand and communicate the information the resources provide."

Traditionally, school library media specialist interaction with a teacher has been focused

on teaching students to link literacy skills with the content area (Cataldo, 2000).

However, Cataldo further states that school library media specialists must also make

connections across disciplines for information needs that reflect both technology and

standards. A case study by Cataldo (2000) revealed participant agreement that using

technology and the standards was beneficial in designing lessons that motivated their

students. Loertscher (2000, p. 70) describes true collaboration that:

> begins at the point when support becomes partnership. This is the point when
> 'What can I get you?" turns into 'What is our best strategy?' Suddenly the 'you'
> becomes 'we.' The participant's role changes from being helpful to being powerful,
> from being peripheral to being meaningful, from passive support to direct impact
> on academic achievement.

In *Helping Teachers Teach: A School Library Media Specialist's Role*, Turner and Riedling (2003) list levels of interaction, which they label as "instructional consultation" (p. 19), as: (a) no involvement, (b) initial, (c) moderate, and (d) in-depth, with in-depth being compared to formal instructional design consultation. They conclude by stating that school library media specialists must become involved as instructional consultants to teachers if they are to make an impact in the world of information technologies.

Too often the school library is conceptualized as having only a marginal role in education. For example, John D. Crowley in *Developing a Vision* (1994) reports that only a few librarians as compared to the number of teachers represented their schools in a High School Futures Consortium and Restructuring Consortium. Crowley also cites a survey by Patricia Cox that found school library media specialists were viewed as having little contact with other educational professionals in the school.

The aim of research conducted by The Library Association and the Survey and Statistical Research Centre at Sheffield Hallam University (Survey and Statistical Research Centre, 2000) was to build a picture of current secondary school library media centers and to identify good practices. A self-completed questionnaire was sent to 2,041 secondary schools in the United Kingdom, with a response rate of 56%. Among the findings was that only 22.7% of libraries worked closely with all departments, and 12.3% did not work closely with any department. This study also found that the librarian, or the person who was responsible for the library, was likely not to be involved in school meetings. Forty-nine percent did not attend departmental meetings, and 63% did not attend curriculum development meetings, showing a trend of lesser involvement than shown on a previous survey. Data from a survey by *School Library Journal* of 783 school

library media specialists (Whelan, 2003) revealed that they ranked information literacy planning and instruction as fourth, behind recommending materials, collection development, and providing materials for students and teachers. Yet collaboration is essential for the school library media specialist to have an effective program. This collaboration includes working with the staff and administration to plan, conduct, and evaluate activities that teach information literacy skills. Planning and collaborating are crucial in the collection, management, and use of resources in all formats to support authentic and information-based learning.

Collaboration with teachers, administrators, parents and all other stakeholders in the learning community in planning, designing, and implementing programs is necessary to ensure that the information needs of all users are met. The librarian is both an insider (member of the school staff) and an outsider (not a classroom teacher) on the curriculum team. With these perspectives, the school librarian can ask challenging questions about the curriculum (Donham, 1998). The school librarian, however, is on the same level as the faculty, so he or she finds it necessary to exert leadership while in actuality a member of the faculty. This is often called leading from the middle (AASL & AECT, 1998). An indirect finding from an empirical study by Schroeder and Zarinnia (2002) in selected middle schools on developing information literacy through solving real world problems found that the librarian was not considered a typical member of the team of teachers constructing problem-based learning scenarios.

School Library Journal's survey of 783 school library media specialists nationwide (Whelan, 2003) showed that there is little awareness of information literacy among educators. In fact, from those surveyed, only 15 % of elementary teachers and 21 % of

junior high and high school teachers responded that they collaborated with school library media specialists on teaching information literacy skills. Of the librarians who reported collaborative activities, only 11 % responded that they "often" plan and teach units with teachers; 51 % responded "sometimes"; 35 % "rarely."

Impact Studies

Texas. Librarian collaboration with teachers was found to be significant in a study of Texas school library media centers, with six activities identified as having a positive impact:

- Planning instructional units with teachers

- Teaching cooperatively with teachers

- Providing training to teachers

- Providing information skills instructions to individuals or groups

- Identifying materials for instructional units developed by teachers

- Serving on curriculum committees (Smith, 2001).

Alaska. Crosstabulation of results of data from the study of Alaska school library media centers indicate that at both the elementary and secondary levels, schools that allow library programs the time for cooperative planning are more likely to have higher achieving students. Almost 75 % of the secondary schools that spent either average or above average amounts of time for cooperative planning had higher achieving students (Lance, Hamilton-Pennell, Rodney with Petersen & Sitter, 2000).

Pennsylvania. Data from the Pennsylvania study of school library media centers supports the Alaska study. The Pennsylvania study asserts that "the constellation of staff activities that help to integrate information literacy in the school is a consistent predictor

of test scores for all tested grades" (Lance, Rodney, & Hamilton-Pennell, 2000b, p. 50).

Integrating information literacy is defined as the combined hours spent teaching cooperatively with teachers, providing in-services for teachers, meeting with curriculum committees, providing instruction for and managing information skills and information technology.

Colorado. Reading scores of students who took the Colorado Student Assessment Program (CSAP) in elementary and middle schools rose as school library media specialists and teachers planned cooperatively with and identified materials for teachers and taught information literacy skills to teachers (Lance, Rodney, & Hamilton-Pennell, 2000).

Florida. The findings of this study support the findings of the other studies that students learn and achieve when school library media specialists work collaboratively with teachers and administrators to teach information literacy skills (Baumbach, 2002).

New Mexico. Data from the New Mexico study (Lance, Rodney, & Hamilton-Pennell, 2002) found higher student achievement was linked with school library media specialists who were involved in teaching cooperatively, providing in-service training, attending faculty meetings, and attending library staff meetings.

Oregon. Data from this study (Lance, Rodney, & Hamilton-Pennell, 2001). revealed that student achievement was higher in those Oregon school library media centers whose specialists participated in (a) planning with teachers, (b) teaching students with teachers, (c) identifying materials for teachers, (d) attending faculty and staff meetings, and (e) meeting with the principal. This study shows that interaction with teachers and the principal can be beneficial to the school's educational program.

Massachusetts. While this study (Baughman, 2000) focused on other variables rather than specifically targeting collaboration, study of the data showed that:

Achieving good MCAS (Massachusetts Comprehensive Assessment System) scores depends precisely on the good working combination of successful administrative leadership, of team building for the implementation of the curriculum frameworks, of excellent teaching, and of strong school library resources in every school (p. 18).

Michigan. According to survey results, significant correlations were found when school library media specialists: (a) taught with teachers, (b) taught information skills without teachers, (c) provided inservice training to teachers, (d) met with other librarians in the district, (e) attended faculty meetings, (f) served on school committees, and (g) met with the principals (Rodney, Lance, & Hamilton-Pennell, 2003).

Minnesota. Analyzing data from the number of classes that were scheduled into the school library media center for instruction, the study concluded, "This collaboration between the media specialist and teachers is the preferred method of teaching students information literacy and research skills" (Baxter & Smalley, 2003, p. 52).

California. Second on the list of top high school issues for school library media centers (only staffing ranked higher) in the California study was staff development and collaboration with teachers. The authors of the study state that "while teacher collaboration on lesson plans is a goal and responsibility for LMS [library media specialists], classroom teachers do not necessarily share that goal" (Siminitus, 2002, p. 14) and often do so only at the urging of the principal.

Iowa. Findings from this statewide study led to the observation that strong school library media programs have a staff with a "collegial, collaborative relationship with classroom teachers…students succeed where the LMS [library media specialist] is a

consultant to, a colleague with, and a teacher of other teachers" (Rodney, Lance, &

Hamilton-Pennell, 2002, p. ix).

Missouri. Analysis of data from this study, contrary to the results of the other

studies, finds that collaboration as a library staff activity was not statistically correlated

with student achievement, as represented by the Overall Weighted Average Map Index

(Miller, Want, & Whitacre, 2003).

Staff Development

Teacher learning enhances student learning. Many school library media specialists

are finding they are responsible for providing technology training for teachers, yet

another opportunity for teacher/librarian collaboration with technology (Hayes, 2001)

since school library media specialists are often the technology leaders in their schools.

According to the Michigan impact study (Rodney, Lance, & Hamilton-Pennell, 2003),

Michigan school library media specialists are spending time training teachers in

technology.

A school district in Louisiana appointed its school library media specialists as the

first technology coordinators of their schools. They were responsible for troubleshooting,

reporting problem tickets, handling inventory and ordering, and inservicing teachers.

Shortly after this, an automated textbook management system was implemented, and the

school library media specialists were selected to be the textbook coordinators at most of

the schools. All of them found the extra duties overwhelming and felt their information

literacy lessons were being shortchanged because they had to spend so much of their time

troubleshooting and maintaining the technology equipment (D. S. Henson, personal

communication, September 26, 2004).

However, a study of California school library media centers found that even though high school teachers must use technology integration in their lessons, they do not necessarily turn to the school librarian for help. In fact, staff development and collaboration was ranked as second only to staffing and student ratios as the top high school issues for library media centers (Siminitus, 2002). Being willing and available are keys to successful collaboration (Buzzeo, 2002), and leadership by the school library media specialist often leads to collaboration. Anderson (2003) suggests that school library media specialists give individual attention to those teachers who feel intimidated by technology, offer small sized classes in the library, and keep in mind the way in which adults learn.

The Colorado study (Lance, Rodney, & Hamilton-Pennell, 2000a) found that while it does not appear to have a direct effect on the test scores, leadership involvement does have an impact on collaboration, and collaboration does have an impact on achievement. This study also showed that test scores increased with increased librarian/teacher collaboration and with the involvement of the librarian in teacher inservice training.

Hayes (2001) states that her role as a school library media specialist was ever changing; she became a "trainer/designer, coach, resource provider, program manager, consultant, task facilitator or process facilitator, and a catalyst for change" (¶ 2). She suggests that school library media specialists should lead job-embedded practices by coaching and mentoring, networking, and conducting study groups. She further states that technology provides a platform for the school library media specialist to become more involved with teachers. Being involved in and/or providing technology integration training to teachers can create opportunities to interact with teachers. This interaction can

lead to opportunities to collaborate with teachers on integrating technology into the information skills curriculum. Anderson (2003) asserts that effective staff development can be as informal as a casual conversation, and she states that unless the learner can immediately apply what he or she has learned, then the training is worthless.

Doll (2005) says that collaboration means that the "school library media specialist and teachers in the school will work together to plan for, design, teach, and evaluate instructional events for students" (p. 4). Suggesting that this kind of collaboration is often not occurring, Doll further states that sometimes collaboration does not happen because of the school environment. She then goes on to discuss some of the reasons, including unawareness of administrators as to the value of the library program so that the school library media specialist's time is spent monitoring study halls or providing a preparation period for teachers.

Montiel-Overall (2005) defines collaboration as a "trusting working relationship between two or more equal participants involved in shared thinking, shared planning and shared creation of integrated instruction" (Defining collaboration, ¶6). From this definition and from research on school library media specialist/teacher collaboration, Montiel-Overall has developed four models of collaboration that describe various levels in working relationships that can develop between school library media specialists and faculty:

- Model A – coordination (schedules, activities, resources, time, space, etc.)
- Model B – cooperation/partnership (working toward similar goals)
- Model C – integrated instruction (integrating expertise to contribute to instruction)
- Model D – integrated curriculum (integrating content and information literacy).

Johnson (2005) has a different view of faculty/school library media specialist

collaboration, saying that he has:

> a real difficulty with how the library profession tosses the word 'collaboration'
> about like it is the Holy Grail…Too many library studies say 'such and such' led to
> greater collaboration. Big whoop. Did it lead to more measurable learning? If I am
> a principal or teacher who worries about literacy rates, I DON'T worry about my
> teachers being collaborative – I worry about them doing what needs to be done to
> raise kids ability to read (Saturday, May 32, 2005 blog).

Young (2003) asserts that collaborative efforts between school library media

specialists and teachers may also play a role in teachers' feeling empowered to do more

than they had felt they could do.

<div align="center">Summary of Literature</div>

As established by significant findings from numerous empirical studies, school

library media centers have a positive impact on student achievement, an impact that

cannot be explained away by school and community differences. This literature review

focused on the impact of technology and on the interactions of librarians with teachers.

Both were found to be positively correlated (although not causal) with increased student

achievement. Technology has opened new opportunities for collaboration, both with

teachers and with students. However, there appears to be little known about the impact

that technology has upon the interactions of teachers and librarians. Local studies of

evidence-based practices will not only add support to the macro statewide studies, but

also provide direction for successful integration of technology and information literacy

skills. School library media specialist and teacher collaboration has been firmly

established as an effective method in teaching lifelong learning and information literacy

skills to high school students. Reidling (2004) believes that technology skills are critical

for the school library media specialist to be an effective leader and to collaborate with

faculty to integrate information skills. She challenges school library media specialists to

be leaders and to "entice collaboration within the school community" (p. 109).

CHAPTER 3. RESEARCH METHODOLOGY

The purpose of this triangulation mixed methods research study was to explore the interactions between school library media specialists and teachers as they use technology. Creswell (2002b) explains the rationale for a triangulation mixed method design, stating that "one data form supplies strengths to offset the weaknesses of the other form" (p. 565). He further elaborates, stating that the results from the quantitative data "provides for generalizability while qualitative data offers information about the context or setting" (p. 566). Tashakkori and Teddlie (1998) state that using both qualitative and quantitative methods allows for triangulation of data, thereby adding to the credibility of the study.

The study consisted of two parts, as shown by Figure 5. Part 1 consisted of a survey (see Appendix A) of school library media specialists who were members of the Louisiana professional association for school library media specialists and who were working in a secondary school setting. Powell and Connaway (2004) state that the descriptive survey is of use in describing the characteristics of a population. Therefore, the researcher chose a descriptive survey to gather data, asking for both quantitative and qualitative data. Part 2 of the study consisted of a case study of three exemplary Louisiana school library media centers. Creswell (1998) defines a case study as an "exploration of a 'bounded system' or a case (or multiple cases) over time through detailed, in-depth data collection involving multiple sources of information rich in context" (p. 61). Data from the multi-site case study were collected from (a) interviews with school library media specialists, administrators, and teachers, (b) observations of school library media specialists, (c) written documents, and (d) a survey of core content area teachers in the selected schools.

Survey of Members of the Louisiana Association of School Librarians

Participants

The participants in the survey were selected through purposive sampling. Tashakkori and Teddlie (1998) define purposive sampling as the "selection of

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┌─────────────┐  ┌──────────────┐  ┌──────────────┐                    ┌──────────────┐  ┌──────────────┐
│ LASL        │  │ School library│  │ Core content │  ┌──────────────┐  │ Core content │  │ School library│
│ Members     │  │ media         │  │ teachers     │  │ Administrators│  │ teachers     │  │ media         │
│             │  │ specialists   │  │              │  │              │  │              │  │ specialists   │
└─────────────┘  └──────────────┘  └──────────────┘  └──────────────┘  └──────────────┘  └──────────────┘
```
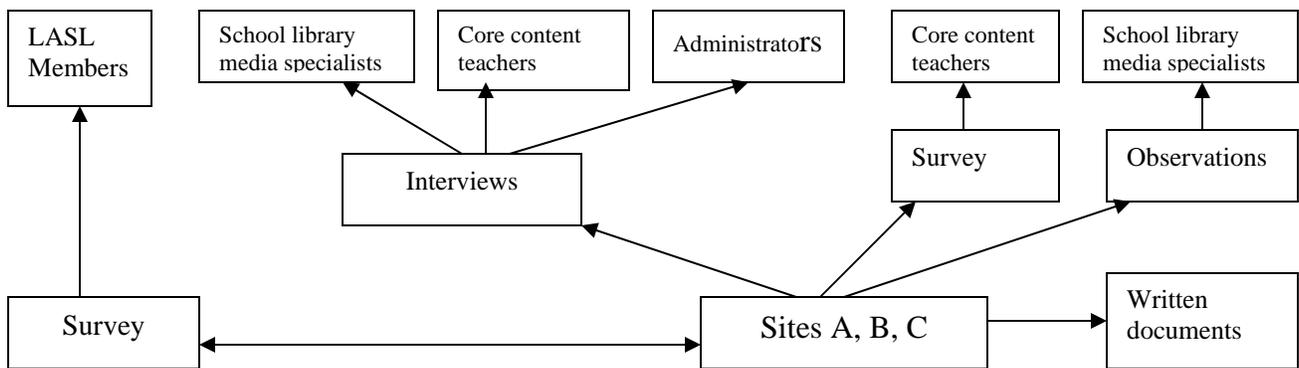
Figure 5. Design of Study

individuals/groups based on specific questions/purposes of the research in lieu of random

sampling and on the basis of information available about these individuals/groups" (p.

76). Since members of a professional organization are perceived to be those who are

more active in their professions, the researcher chose to survey members of the Louisiana

Association of School Librarians (LASL), a section of the Louisiana Library Association

(LLA). School library media specialists were identified from a list of members of LLA in

the Membership Directory of the association. From this list, members of LASL were

identified. Those 143 members of LASL who were in a secondary school library media

center comprised the sample. School library media specialists were from both public and

private schools, urban and rural, small and large – a sampling that is representative of the

larger population of school library media specialists and ensured that all socio-economic

status groups, ethnic groups, and student performance levels were represented.

Permission was granted to the researcher from the University's Institutional

Review Board. The president of LASL and the executive director of LLA were made

aware of the study. The researcher also asked a group of librarians who had attended a

conference session at the LASL Midwinter Conference 2005 if they would be willing to

participate. From this effort, six additional names were added to the list.

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Participation in the study was completely voluntary, with the identity of the respondents kept confidential. Those who responded to the print survey signed a consent form, and those who responded to the online survey signified their willingness to participate by clicking on the "I Agree" button.

Instrument

The objectives of the survey were to: (a) discover the number and type of interactions created or promoted by technology and to (b) determine the perceptions of school library media specialists, teachers, and administrators on the use of technology in teaching information fluency skills. A search of *Mental Measurements Yearbook* and a search of the literature on school library media centers did not reveal an appropriate instrument. Therefore, the researcher created an instrument. In an effort to establish content validity, the researcher asked for input from other school library media specialists, as well as teachers, a school library professor, and a doctoral candidate whose area of concentration is educational technology. The input from these peers was especially valuable in adding to both credibility and validity by keeping the instrument consistent with the research questions and in ensuring that the wording was clear enough that the respondents would not mistake the meaning.

The survey also asked respondents for demographic information, number and kinds of technology in their school library media center, and type and frequency of interactions with teachers. One section was a survey of the Stages of Adoption of Technology (Christiansen, 1997). Knezek, Christensen, Miyashita, and Ropp (2000) describe this instrument as a quick self-assessment that asks the respondent to choose the level of adoption of technology from these stages: (a) Awareness, (b) Learning the Process,

(c) Understanding and Application of the Process, (d) Familiarity and Confidence,

(e) Adaptation to Other Contexts, and (f) Creative Application to New Contexts.

Christensen and Knezek (1999) report a high test-retest reliability estimate of .96 from a

survey of a sample of 97 K-12 teachers. Time of completion was important since this was

part of a longer survey; the Stages of Adoption of Technology Survey typically takes less

than five minutes to complete (see Appendix B).

Administration of Survey

A RAND publication (Schonlau, Fricker, & Elliott, 2001) on e-mail and Internet

surveys states that an Internet survey should be considered when the target population is

but a small part of the total population. The authors indicate that respondents "give longer

answers to open-ended questions in electronic surveys than open-ended questions in

printed surveys" (p. xv). They further state that Internet surveys may be preferable to

mail or telephone surveys when the researcher has access to a list of e-mail addresses for

the targeted population. Since the survey in this research contained open-ended questions

and since the researcher had access to an e-mail list, the researcher decided to make use

of an electronic survey.

The survey was piloted with five selected school library media specialists in the

researcher's school district. The pilot allowed the researcher to test the dissemination

method and to gain input on the clarity of items on the survey. Adjustments in the

wording of the questions were made on two questions when the question was

misunderstood by the respondents. A follow-up interview with one of the librarians after

she answered the survey provided more helpful suggestions on the wording of the

directions on the homepage of the Internet survey, as well as suggestions on the time

required to take the survey. All of these school library media specialists were on the same

network as the researcher, so all of them used Internet Explorer to open the link to the

Internet survey. To further test the administration procedures, the survey link was sent to

at least six volunteers with various browsers. This test revealed that some of the browsers

did not recognize the format of the online survey. Because of this problem, the directions

on the homepage of the online survey were amended to include the message that the

survey worked better with Internet Explorer and provided a link for download if the

respondent desired to download Internet Explorer. Assuming that some of those

contacted would not wish to download Internet Explorer, the researcher sent the survey as

an attachment in Rich Text Format in all e-mail messages.

Schonlau, Fricker, and Elliott (2001) indicate that Web surveys can be conducted

quicker than either mail or phone surveys if the initial contact is by e-mail. Therefore, the

researcher contacted the participants by e-mail; the e-mail contained the link to the

survey posted on the Internet. The message in the e-mail explained the purpose of the

survey and assured confidentiality. In an effort to encourage the school library media

specialists to participate in the survey, respondents were told that each respondent would

have his/her name entered into a drawing for a $20 gift certificate to Barnes and Nobles

bookstore if an optional name and address form were completed.

Some of the e-mail messages were returned as undeliverable. The researcher sent a

print copy of the survey to these Louisiana Association of School Librarians members by

United States Post Office mail, with a cover letter that also provided the Uniform

Resource Locator (URL) of the online version so that the respondent could respond to the

electronic version or return the print survey by mail. To ensure maximal response, a

follow-up message was sent to all non-respondents (e-mail addresses and United States Post Office addresses) after two weeks. Another reminder was sent two weeks later.

Limitations

Data are from the southern region of only one state. However, the sample encompassed all socioeconomic and student performance levels, as well as ethnic groups. Although the instrument (survey) was created and therefore has not been tested for validity and reliability from other users, it was piloted with secondary school library media specialists in one parish before being administered to the larger sample. Content validity was established through input from colleagues.

Data Analysis

Research often proceeds in "overlapping stages" with data collection and data analysis an integrated activity (Mellon, 1990, p. 25). Initial data analysis consisted of reading and thinking about the data. Themes began to show up as patterns, sometimes determining a new direction. The initial data were analyzed in an effort to answer the main research question: What are the interactions of school library media specialists and teachers associated with the use of information technology? Data were further analyzed in relation to these sub questions:

- What is interaction as perceived by school library media specialists? By teachers?
- What interactions are created or encouraged by information technology?
- What is the contextual climate of the interactions?
- What interactions, if any, lead to collaborative lesson planning between the librarian and the teachers? In what content areas? How often?
- What are the ways that technology is being used to teach information literacy skills to students?

The descriptive statistics from the survey provided insight into the practices as related to the use of technology and the impact this has on the interactions of school library media specialists and teachers. Using Excel, Access, and SPSS, the survey data were described, using text, tables, and graphs. The response rate was calculated, the data were checked for bias, and the descriptive reports of both aggregated and disaggregated data were analyzed for general patterns. This data were then added to the data gathered from the observations, interviews, and analysis of documents in the case study.

<div align="center">Case Study of Three Exemplary School Library Media Centers</div>

According to Gorman and Clayton (1997), qualitative research methods suit the "background of many information professionals better than quantitative methods" (p. 35) because it contributes to triangulation and allows for study of the complex information society in which we live. Interviews, observations, written documents, and a survey of selected core content area teachers were used to collect data.

Participants

The target population for this study was high school library media specialists. Using purposive sampling, three secondary schools with exemplary school library programs were chosen for study, based on recommendations from the leaders of the Louisiana Association of School Librarians (of which the researcher is a member), secondary school principals, a professor and a former professor at a university with a graduate program in library and information science, lists of award-winning school library media centers, and through the researcher's own networking of contacts (the researcher is a secondary school library media specialist). The researcher also used these criteria in deciding upon the school library programs to be studied: (a) there must be a

certified librarian staffing the library, (b) access to technology through computers with Internet access that are networked to other computers in the school through a local area network must be available, and (c) there must be evidence of librarian/teacher collaboration in using information technology and teaching information literacy skills. The selected school library media centers were from three different parishes in south Louisiana so there would be a broader geographical base offered. Of the three school library media centers selected, one is a public high school with a high poverty rate, one is a private parochial high school, and one is a magnet school. The researcher chose three different socioeconomic and academic levels in order to get different perspectives (Creswell, 1998). Libraries that offered opportunities for the richest description of effective interaction between librarians and teachers were chosen so that the data would contribute to the existing knowledge base on school library media centers. The data also contributes knowledge to an area not previously studied in the literature – that of the role of technology on school library media specialist/teacher interactions.

<u>Design</u>

In this comparative case study, the activities of four school library media specialists were studied, with the resulting data providing insight into the role of technology in the interactions between school library media specialists and teachers. Multiple forms of data were collected in an effort to develop an in-depth understanding of this issue (Creswell, 2002a). Naturally occurring interactions on a "typical" day were emphasized as data were collected through interviews, a survey, observations, and written documents. The researcher conducted the research as an observer-participant or observer. Participation by the researcher was kept to a minimum. A method essential to qualitative research, the use

of observations allows the researcher to record actual behavior, rather than what the participant said occurred (Powell, 1997). Unstructured observational data were obtained by observing and taking field notes at all three of the sites. School library media specialists were also interviewed, using the one-on-one approach in a semi-structured format. School administrators were interviewed to get their perspectives.

Also studied were perspectives of teachers. All core content area teachers (math, English, social studies, science) were given a survey to complete. One teacher from each of the core content areas was selected by the school library media specialist for the researcher to interview in a semi-structured format. Each person interviewed received a bookmark as a token of appreciation for his or her participation.

Procedures

Permission forms from the participating school library media specialists, administrators, and the selected teachers were obtained. These participants were assured of confidentiality and privacy, as well as being assured that there would be little disturbance to their daily routine.

The researcher contacted the selected school library media specialists by e-mail to arrange face-to-face meetings with the school library media specialists and their administrators to explain the study and what was expected of them if they chose to participate in the study. The first three sites contacted agreed to participate in the study. At the initial meeting and with the school library media specialist consulting his/her calendar to choose an appropriate time, appointment times were set for the observations, surveys, analysis of documents, and interviews to be conducted. School library media specialists and administrators were advised that the researcher planned to examine:

(a) the library calendar of scheduled classes, (b) students' standardized test scores, (c) specific student research assignments, and (e) school performance data in an effort to provide a detailed and rich description.

According to Sara Lawrence-Lightfoot (1997)**,** context "becomes the framework, the reference point, the map, the ecological sphere; it is used to place people and action in time and space and as a resource for understanding what they say and do" (p. 41). Therefore, the context was examined and carefully considered in each situation. The nine dimensions of social situations (space, actor, activity, object, act, event, time, goal, feeling) as described by James Spradley (1980, p. 82) in his Descriptive Question Matrix were carefully considered. As an observer-participant (Creswell, 2002b), the researcher collected data through field notes with both objective description and reflection of the observed activities. Field notes for the observed behavior were written promptly to prevent a loss of important data from the researcher's forgetting what was observed (Mellon, 1990). Pertinent communication in the form of mail, e-mail, or memos was collected, as well as photographs of the school library media center and the school campus. Written documents were examined.

Semi-structured interviews with school library media specialists, administrators, and teachers were conducted, using a predetermined protocol for each (see Appendix C). General questions provided a focus on the topic, and others were included as needed to elicit data on important points. In an effort to obtain richer detail, the interviewee was at times encouraged to give examples (Mellon, 1990). After the interviews, administrators and teachers were given a bookmark as a token of appreciation for their participation, and school library media specialists were given a Barnes and Noble gift certificate.

Observations of the school library media specialists at each site took place on two

different days when classes were scheduled into the library media center for research. At

School A, the researcher was an observer-participant. At School B, the researcher was an

observer. At School C, the researcher was an observer-participant.

Member checking is important to ensure accurate data. Therefore, a transcript of

the interviews, along with a stamped envelope and a label with the researcher's address

on it, was mailed to the interviewees, asking that they verify and clarify the information

to be accurate as reported. Three of the interviewees did return the transcript, with minor

errors marked (such as English III, rather than English IV).

<u>Data Analysis</u>

Data were collected to answer each of the research questions. The sources of data

for each question are displayed in Table 3. Powell and Connaway (2004) describe

qualitative data analysis as a cyclical process in which the "collection of data affects the

analysis of data which, in turn, affects the gradual formation of theory which, in turn,

affects the further collection of data" (p. 196). The qualitative data from the interviews,

observations, and short answer questions from the surveys were analyzed through the

constant comparative method by comparing incidents and assigning categories

(Tashakkori & Teddlie, 1998). Powell and Connaway further suggest that perhaps the

most useful method of grouping categories in library and information science studies is

clustering. This method worked well in this study, as the researcher clustered those

interview statements that involved technology and those that involved collaboration. Data

analysis moved in analytic circles from data managing to memoing and reading to

describing, classifying, and interpreting to visualizing and representing (Creswell, 1998).

Table 3. Research Questions and Source of Data

Research Question	Source of Data
What are the interactions of school library media specialists and teachers associated with the use of information technology?	- Survey of school library media specialists - Interviews of school library media specialists - Observations of school library media specialists - Survey of core content area teachers - Interviews with core content area teachers - Interviews with administrators
What is interaction as perceived by the school library media specialists?	- Observations and interviews of school library media specialists - Survey of school library media specialists
What is interaction as perceived by the teachers?	- Survey of core content area teachers - Interviews with core content area teachers
What interactions are created or encouraged by information technology?	- Survey of school library media specialists - Interviews of school library media specialists - Observations of school library media specialists - Survey of core content area teachers - Interviews with core content area teachers - Interviews with administrators
What is the contextual climate of the interactions?	- Interviews of school library media specialists - Observations of school library media specialists - Interviews with core content area teachers - Interviews with administrators
What is the frequency of interactions between the school library media specialist and the teachers? In what content areas?	- Survey of school library media specialists - Interviews of school library media specialists - Observations of school library media specialists - Survey of core content area teachers - Interviews with core content area teachers - Written documents (calendar/library schedule)
What are the ways technology is being used to teach information literacy skills to students?	- Interviews of school library media specialists - Observations of school library media specialists - Written documents - Teacher surveys - School library media specialist surveys

The descriptive statistics from the survey of the core content area teachers provided insight into practices as related to the use of technology and the impact this has on the interactions of school library media specialists and teachers. Using Excel for data input by the respondents to the school library media specialist survey, Access to print out the reports, and SPSS to analyze descriptive statistics, the survey data were described with the use of text, tables, and graphs. The response rate was calculated and the descriptive reports of aggregated and disaggregated data were analyzed for general patterns. This data were added to the data gathered from the observations, interviews, and analysis of documents.

<div align="center">Credibility and Validity</div>

The credibility of the qualitative components requires that the researcher ensure trustworthiness through credibility, transferability, dependability, and confirmability. Trustworthiness in this study was established by triangulation that included (a) use of more than one method of data collection (observation, interviews, analysis of documents), (b) member checking by asking for participants' feedback on the rough draft of data collected from the interviews, (c) data collected from three cases on more than one day and in three locations, and (d) prolonged engagement with the participants. Credibility of the study was also established from the literature review, the careful selection of participants, and the credentials of the researcher (Creswell, 2002b). Content validity was addressed through the use of a pilot study and from peer debriefing by a colleague. Thick description contributed to the transferability of the results, and the use of field notes contributed to the dependability of the research.

CHAPTER 4. DATA COLLECTION

Survey of Members of Louisiana Association of School Librarians

An e-mail message was sent to 143 members of the Louisiana Association of

School Librarians (LASL) identified as school library media specialists at secondary

schools, asking them to respond to an online survey. Of these 143 messages, 17 were

returned as undeliverable; a print copy of the survey along with an introductory letter was

sent to these members. An introductory letter provided the Web site address for the

survey if the addressee wished to respond online. Two weeks after the initial contact, a

reminder was sent to all contacts, and two weeks later, another reminder was sent to all

contacts.

The researcher received nine printed copies of the survey and 33 online

responses, a total of 41 responses, or approximately a 29% response rate. Ten of the

school library media specialists asked for a copy of the survey results, and two

commented that the survey was a little difficult to read on their computer screen because

of its green background. Data from the online survey were entered directly into an Excel

database from the Web site itself. Data from the printed surveys received via mail were

manually entered into an Excel database. This data were then transferred into an Access

database so that reports could be printed. The Access reports were particularly helpful in

providing a printout of the short answer data so that this could be analyzed for themes.

Finally, the quantitative data were entered into SPSS for descriptive analysis.

Case Study: School A – Public High School

School A is located in south Louisiana near a major metropolis of almost 500,000.

The 2000 census reported a population of 22,226 for the city, a median household income

of $30,010, and a racial makeup of 45% White non-Hispanic, 42% black, 5% Hispanic, and 4% Vietnamese. For those over 25 years of age, 71% have completed high school or higher, 14% have completed a bachelor's degree or higher, 4% have completed a graduate or professional degree, and 9% are unemployed (City-data, 2006).

There were 1,510 students enrolled at School A in 2004, with 106 faculty members. Of the total student population, 86% were regular education students, and 14% were students with disabilities. School A is accredited by the Southern Association of Colleges and Schools and for the past two years has been labeled as having "Exemplary Academic Growth" by Louisiana's accountability program, even though it still ranks as "one star" school for its low School Performance Score. The School Performance Score (SPS) assigned by the Louisiana Department of Education for 2004 was 63.6, a 10.8 increase over the 2003 score of 52.8. The state average SPS for 2003-2004 was 84.1.

The Spring 2004 GEE21 Test Performance by Achievement Level, as reported by the Louisiana Department of Education, is shown in Table 4. The average ACT scores by subject area and the ACT composite for School A, as reported by the Louisiana Department of Education, are shown in Table 5. English/Language Arts performance is low, but, according to the school library media specialist, students ranked in the 67th percentile on the Information Sources section of the Iowa Test of Basic Skills.

Table 4. GEE21 Scores, 2004, School A

Achievement Levels	English/Language Arts	Math	Science	Social Studies
Advanced	Less than 1%	2.4%	2.2%	1.3%
Mastery	11.5%	11.9%	11.1%	8.3%
Basic	38.1%	34.9%	35.4%	49.7%
Approaching Basic	23.0%	15.8%	30.3%	28.7%
Unsatisfactory	26.8%	35.0%	21.0%	12.1%

Table 5. ACT Scores, 2004, School A

Composite	18.4
English	18.1
Math	18.1
Reading	18.2
Science	18.7
Total taking test	228

Of first time freshmen in Louisiana colleges and universities from School A, 53% were in developmental math courses; 32% were in developmental English classes; and 11% were in developmental reading classes. The attendance rate was 90% (with the state average being 93.5%), and the dropout rate at School A was 9% (with the state average at 5.4%). The percent of core courses taught by highly qualified teachers was 95%. Sixty percent of the students were on the free and reduced price lunch program, indicating a high poverty rate for the student population. The school did not offer the Accelerated Reading management program; however, Read 180 (a reading intervention program) had just been implemented. Read 180 was housed in a classroom separate from the library media center, and the school library media specialists did not administer this program.

Finding a parking place not marked as "Reserved," the researcher entered the school bus loading/unloading area on the morning of the first visit. The school itself was part of a large complex that included areas for the sports programs and a large area of well-kept open grounds with trees and shrubbery completing the attractive campus. The friendly and helpful person on duty gave directions to the office. Walking through the gates onto the campus, the researcher found students (dressed in uniforms) sitting and

standing in the commons area, talking and enjoying the spring morning. There was no

misbehavior. After checking in at the office, the researcher was given a visitor's pass and

directions to the library media center. The school was located in an area that includes

both residential and commercial buildings. With a large campus of several buildings

(some temporary buildings) connected by covered walkways, the halls were a maze to

navigate. A mural with the School A mascot covered one of the halls, a bright spot with

its red and black colors. In fact, there was a lot of color on this campus, from the colored

windowpanes to the red student lockers to the outside garbage cans with a red stripe

circling the center. Students and faculty were helpful in helping the researcher to find the

library media center, and she felt comfortable asking for help. The directions led through

the halls and outside on a sidewalk leading to a separate building. Large open spaces

attractively landscaped with beautiful live oak trees, crepe myrtle, and shrubbery

provided a feeling of spaciousness to the cleanliness and attractiveness of the campus.

School A had a well-designed Web site with frames that link to specific sites, such

as LA PASS, Groupwise, and United Streaming. Although there was not a separate Web

page for the library media center, it was evident that the school library media specialist

had an input into the Web design. The Educational Links button led one to links for

Virtual Fieldtrips, Federal Resources, Homework Central, Gale Group, Louisiana State

Legislature, and World Book Online.

School Library Media Center

School Library Media Specialist A welcomed the researcher to his office warmly,

and the conversation immediately turned to the school library media experience. He was

kind enough to recommend several professional books that would be beneficial to any

school library media specialist. His expertise was extensive, and his resume listed his many publications and presentations. Asking what kind of information was needed for the study, School Library Media Specialist A printed out the School Profile and a list of the databases available to his school. His print collection contained approximately 15,000 titles with 17,000 copies. To make the research stay more effective, School Library Media Specialist A had placed a note on the teachers' electronic mail, stating that a researcher was going to be at the school and asking for their cooperation. He then showed the teachers' schedules and suggested that the researcher take the content area teacher surveys to the teachers at the planning period for each of the core content area teachers (all had the same planning period and were located in the same hall). He then began a tour of the school, taking care to go to each of the halls where the surveys would be handed out to teachers. School Library Media Specialist A also provided a copy of the schedule so the teachers' names could be checked off as the surveys were given out to make sure that every teacher would be contacted. He also introduced the department chairs and asked each of them to cooperate in the study.

The school library media center was attractive, with a magnolia painting and several posters on the walls titled Thinking about Questions, Evaluating Web Resources, Choosing a Search Tool, What's Not on the Free Web, and URL's: Clues to Content. The circulation desk was at the entrance, and to the right of this desk was a teachers' technology room with five computers, scanners, printers, and the professional collection. This resource had just been added this year, with the equipment available for teachers to use whenever they wish. To the left of the entrance was the reference room with seating for students to work.

There were two school library media specialists at this library media center, and both had an office. School Library Media Specialist A's office was overflowing with books, both professional and student-oriented, including entire encyclopedia sets. As a committee member for many organizations and as a prolific author, School Library Media Specialist A received many of these books at no cost to him or his library. He had a computer workstation at his desk, but shared the printer in the main room of the library. As a member of the School Improvement Plan committee, he was involved in all areas of the curriculum at School A. Active in several professional library organizations, School Library Media Specialist A had been a school library media specialist for eight years.

In the main room of the library were eight student computer workstations lining a wall that had a window overlooking School Library Media Specialist A's office, one circulation desk computer, and a laser printer. The workstations had these desktop icons: PowerPoint, Word, Acrobat Reader, MSReader, Library catalog, Wordpad, Internet Explorer, SIRS Researcher. Internet Explorer was password protected, and the homepage was set to Google. Links were provided to Infotrac, School A Parish Schools, School A Mascot with Selected Sites (on Backflip). Tables and chairs offered enough room for an entire class to work. To the right of the tables was the fiction section, with new books tagged with a "New Book" sticker. Signage was good, with large posters labeling the fiction and nonfiction section.

During the conversation with School Library Media Specialist A, students were coming and going from the library. If no one was at the circulation desk, the students came into School Library Media Specialist A's office to ask him their questions. He always stopped to help them with their information needs. A class came in for research;

the atmosphere was comfortable with both teacher and students. School Library Media Specialist A constantly moved around the room, helping students find information. His no nonsense voice and attitude kept the students on task. There was some talking among the students, but it was low and controlled. The teacher, English Teacher A, had good rapport with both her students and with School Library Media Specialist A. Few students used the Internet, and School Library Media Specialist A explained that only 436 of the 1,510 students had returned their parental consent forms for Internet use at school. Therefore, all students can use the databases that are on the local area network (and were encouraged to do so), but most cannot use the Internet.

In between visits to the various departments, the researcher observed School Library Media Specialist A as he worked with classes in the library media center. The researcher also interviewed him on both days of the site visits, asking questions as they came up with students or faculty or as they occurred in conversation as well as in a formal interview. After this first visit, the researcher reflected on the field notes and made a list of the areas not covered so that these could be addressed at the next visit. Numerous e-mails were sent after the visit to ask for additional information or for clarification, and further information was gathered when the school library media specialist attended a class meeting with the researcher during the following summer.

The Halls and Classrooms

At the science department planning period, the researcher went to the science hall to personally hand out the teacher surveys to each teacher and to find a science teacher who would agree to an interview. The cover letter explained the research study and asked teachers to complete the survey and to return it to the library media center or put it in

School Library Media Specialist A's mailbox. Those completing the survey at each school would be entered into a drawing for a $20 gift certificate to Barnes and Noble. Some teachers were not in their classrooms or the lounge; those would be contacted the next morning. Some of the teachers were welcoming; others made the researcher feel as though she were trespassing on their all-too-short planning period. School Library Media Specialist A had suggested that Science Teacher A, the biology teacher, would likely agree to an interview. Science Teacher A did agree to an interview. Yet his actions implied that he hoped this would not take too long because the interview was conducted while the researcher was standing by his desk. However, he was cooperative and articulate, answering all questions. He had computer equipment in his room, and it was apparent that he used it.

Next was the social studies planning period, and the same method of delivering the surveys was followed. Again, some of the teachers were not in their rooms or in the hall, making it necessary to find them the next visit. The social studies chairman said he did not have time for an interview; however, another social studies teacher who was in the teachers' lounge readily agreed to an interview. He taught World History, World Geography, and Free Enterprise. His room was a typical classroom in a fifty-year-old school building. Social Studies Teacher A was friendly, cooperative, and seemed happy to cooperate. He sat at his desk, and the researcher sat at a student desk for the interview.

Walking down the math hall (this school is a maze of halls!), one could see posters on the walls, such as "You can't be positive if negative." School Library Media Specialist A had previously introduced the math department chair to the researcher, and she agreed to an interview for the next day at her planning period. Surveys were given to

as many of the math teachers as could be found in their rooms or the halls during this time.

At the English planning period, surveys were delivered to all of the available English teachers. Then the researcher interviewed English Teacher A, who was vivacious and articulate. She made the researcher feel as if she were happy to be interviewed. Both the researcher and the teacher sat at student desks. English Teacher A was interested in the current research and extremely complimentary of School Library Media Specialist A and his library media program. Her classroom was cheerful and inviting.

School Library Media Specialist A suggested to the researcher that she sit at the desk where teachers sign in the next morning to deliver the rest of the surveys. This proved to be a good idea, because several teachers either returned their surveys or mentioned that they would complete it that day and return it. Then during the homeroom period, the researcher circulated the halls to see if any had not received a copy of the survey and to encourage others to complete the survey. Many were taking attendance or otherwise busy, so this was not too successful. School Library Media Specialist A agreed to mail any surveys that were turned in after my visit. He did mail two the following week.

Content Area Teacher Survey at School A – Public High School

When all the surveys had been collected, a total of seventeen teachers had returned the survey at School A. Six (43%) English teachers from a total of fourteen returned the survey; four (33%) math teachers from a total of twelve returned the survey; two (17%) social studies teachers from a total of twelve returned the survey; five (42%) science teachers from a total of twelve returned the survey.

Case Study: School B – Magnet High School

School B is located in the mid-city area of a city with a population of just over 400,000. The 2000 census from the United States Census Bureau reported a median household income of $37,224 and a racial makeup of 56% white, 40% black or African American, and 21% Asian. For those over 25 years of age, 31% had bachelor's degree or higher. There was a 5% unemployment rate (City-data, 2006).

Founded in the early 1890's, School B has moved its campus several times throughout the years. In an urban setting, the present campus was built in 1925, with additional buildings and renovations in the 1950's. In 1976, School B was designated as a magnet school. The school was twice named a National Blue Ribbon School of Excellence by the United States Department of Education and was accredited by the Southern Association of Colleges and Schools (SACS). Recently the school was named a Creative School Ticket of Excellence.

The enrollment of 1,270 was made up of 44% white, 47% black or African American; 9% Asian/Pacific Islander; and less than 1% American Indian/Alaskan Native, with girls outnumbering the boys by a 2:1 ratio. The majority of the students were from middle to middle-upper class homes, with 24% qualifying for the free or reduced price lunch program. The curriculum offered Advanced Placement programs and honors classes. Students in the ninth and tenth grades were required to participate in the Accelerated Reader program. The attendance rate was 96%, and the dropout rate was less than 1 %.

The average ACT score of 24.1 (state average is 19.8; national average is 20.9) reflected the strength of the academic program at School B. Approximately 96% of the

2004 graduation class attended a four-year college, and School B had seventeen National

Merit Semifinalists in 2004. Few of the students were placed in developmental courses

when they attended college: 8% in developmental math; 2% in developmental English;

and less than 1% in reading. Ninety-six percent of the core courses were taught by highly

qualified teachers.

The results of the Graduate Exit Exam (GEE21) for 2004 as reported by the

Louisiana Department of Education are listed in Table 6. Average ACT scores for 2004

(as reported by the Louisiana Department of Education) are listed in Table 7.

Table 6. GEE21, 2004, School B

Achievement Levels	English/Language Arts	Math	Science	Social Studies
Advanced	5%	40%	16%	7%
Mastery	55%	31%	34%	42%
Basic	30%	28%	38%	52%
Approaching Basic	.3%	2%	5%	1%
Unsatisfactory	0%	0%	7%	0%

Table 7. ACT Scores, 2004, School B

Composite	24.1
English	24.7
Math	23.3
Reading	24.7
Science	22.9
Total taking test	252

The School Performance Score (SPS) for 2004 was 159, which designated the school as a five-star school of academic excellence as named by the Louisiana State Department of Education.

The school had a well-designed and maintained Web site that was easily navigated, and the library media center's Web page was linked from the school's homepage. The library page included the mission of the library media center and stated library procedures, as well as providing links to reference databases and Web sites arranged by topic.

After receiving permission from both the school library media specialist and principal for their voluntary participation in the study, the researcher contacted the school library media specialist by e-mail to set up a date for the first visit to the school. Parking was a problem, so the researcher parked at a small shopping area a couple of blocks from the school and walked to the campus, which took up an entire city block. The campus was beautifully landscaped with majestic live oak trees and shrubbery bordering the street and sidewalks leading up to the front of the main building. Benches under the trees invited one to sit to enjoy the beauty of this historical building and the grounds. The architecture style and building materials dated the buildings; however, the entire campus has been so well maintained that the building is listed as a historical site on the National Register of Historic Places. The newer buildings do not detract from the overall historical aspect, as they obviously were built to complement the original structure. There was plenty of green with the trees, shrubbery, and grass in the large front "yard" of the complex. Upon entering the main building to register as a visitor at the office, the researcher was impressed to see how well kept the building was. A center hall ran the

entire length of the building. The main office was a busy place with faculty signing in and students (dressed in uniforms) asking questions and announcements being read over the intercom. However, the receptionist was friendly and welcoming, providing directions to the library. Many foreign language festival trophies were displayed, as well as a banner announcing the school's designation as one of academic excellence. Concrete stairs at each end of a center hall led to the second floor, where the school library media center was located along one side of the hall.

School Library Media Center

Arched windows along the back wall of the school library media center allowed a beautiful view of the front grounds of the campus with its live oak trees and shrubbery. Other windows also offered a view of the outside. Although obviously originally classrooms, the allotted space had been utilized to not only allow efficient use of the available space, but also to make it attractive. Posters were everywhere, and there was a rack filled with Pathfinders and other helpful information, such as tips on how to research effectively. To the immediate left as one entered the school library media center was the circulation desk, which had colorful posters on it. The researcher was met warmly by School Library Media Specialist B, who introduced the other staff member, a retired teacher on temporary appointment for the other school library media specialist who was on medical leave. The library was busy with students checking out books, using the computer workstations, and browsing the collection. An additional computer lab was in a classroom that opened into the school library media center.

The library had opened at 6:15 a.m. (as it did every morning) to accommodate the students who wished to take advantage of its resources. When asked about so many

students, both School Library Media Specialist B and her assistant stated that it was the norm to have students waiting for the library media center to open in the mornings. Students also filled the room during the lunch break.

School Library Media Specialist B introduced the researcher to Principal B and Assistant Principal B. Both welcomed the researcher to the campus. Principal B, a former school library media specialist herself, exhibited a passion for student learning that was transmitted to the listener through her excitement for the academic environment and achievements of the school. An articulate, high-energy person, Principal B gave the appearance of one who was accustomed to successfully instituting programs for the purpose of increasing student achievement. Praising the school library media program, Principal B portrayed her respect, admiration, and appreciation for School Library Media Specialist B and the excellent work she did, not only for the school library program, but also for the entire school.

School Library Media Specialist B gave a brief synopsis of her program and set up the days for return visits to observe her program, to interview one teacher from each of the core content areas, and to administer the survey to content area teachers, as well as to interview Principal B. School Library Media Specialist B's interview took place in the library media center. Content area teachers were interviewed at the library media specialist's desk. Although her desk was not in an enclosed office, the location did provide enough seclusion from the library media center activities that the interviewees could feel confident that their responses were confidential and not overheard by anyone. While these interviews were being conducted, the school library media specialist was working on a project in another part of the library media center.

<u>Content Area Teacher Survey at School B – Magnet High School</u>

School Library Media Specialist B suggested that the researcher mail the core content area teacher surveys to her so that she could give out the surveys personally to the teachers before the next visit, hoping that this would ensure a better return rate (in actuality, it did not). She mentioned that she had a good rapport with the teachers, and she felt they would respond better to her request for them to complete a survey rather than one from a researcher whom they did not know. This plan gave the researcher less personal contact with the teachers than at School A; in fact, this meant the researcher never saw most of them. The content area surveys were mailed to School Library Media Specialist B, but she did not give them out until the morning of the second visit. Teachers returned them to the researcher in the library media center.

A total of fifteen teachers (31%) returned the survey at School B from a total of 45 given out. Six (43%) English teachers from a total of fourteen given out returned the survey; five (42%) math teachers from a total of twelve returned the survey; two (17%) social studies teachers from a total of twelve returned the survey; and two (17%) from a total of twelve science teachers returned the survey.

<div align="center"><u>Case Study: School C – Private, Parochial School</u></div>

School C is located in a city of just over 100,000 in south Louisiana. The 2000 census reports a median household income of $35,996 and a racial makeup of 68% white, 30% black or African American, less than 1% American Indian and Alaskan Native, and 1% Asian. For those over 25 years of age, 82% have completed high school, and 31% have a bachelor's degree or higher. The unemployment rate is approximately 5% (City-data.com).

With an enrollment of 1,081, the school's population is 4-5% nonwhite. The free and reduced lunch rate is less than 1%. Accredited by the Southern Association of Colleges and Schools and approved by the Louisiana State Department of Louisiana, School C is a private parochial school that has been named a Blue Ribbon School of Excellence by the United States Department of Education three times in recent years. According to the school's Web site, the school offers a college-preparatory curriculum, but does provide academic support for students with special needs. Nine Advanced Placement (AP) classes are offered, and nineteen students earned the designation of AP Scholar by the College Board for exceptional achievement on the AP Exams. Relatively few of first time freshmen who attended Louisiana colleges and universities were enrolled in developmental classes in the 2003-2004 term: 9% in developmental math; 2% in developmental English; none in developmental reading.

After receiving permission from the administration and school library media specialists to conduct research at their school, contact dates were set up for the site visit through e-mail messages. Arriving at the school just before school began in the morning, the researcher was faced with the early morning traffic of faculty, students, and parents dropping off their students. The school building was built in 1982 and sits on 25 acres, of which 3.5 is under roof. Additions and an athletic complex were completed in 1998.

The main entrance was bustling with students coming in to the commons area, which was located at the center of the main lobby. A large awards display of trophies indicated that this school was a high achieving one. The Chapel area was to the right as one entered the main entrance. Walking through the crowded commons area to find the office meant navigating through throngs of students (dressed in uniforms) who were

visiting with their friends. By the office was a wall of faculty awards. The office staff was busy with check-ins and other typical early morning tasks. The students, lively, animated, but so well behaved, were friendly to someone who was obviously a visitor. They willingly and cheerfully gave directions to the school library media center. Everyone, including custodians, students, and the teachers in the hall, was friendly.

In the halls of School C, the walls were decorated with posters, displays of student work, and a Wall of Achievement that announced the honor roll students' names. Student lockers were also in the halls. South of the main building was an open field, which added to the pleasant appearance of the campus. During class time, there were few, if any, students walking through the halls; the halls were quiet.

The first twelve minutes of school were for announcements. A student assigned to the library for "study hall" because he was enrolled in more than one AP class was responsible for running the rolling announcements that were played through Channel One equipment to the entire school.

School Library Media Center

School Library Media Specialists C and D were in the library assisting the 100 or so students who were in the library media center busily working on various projects. Students were talking softly among themselves, and most were using the provided technology to search for information, to complete an assignment, or to print out information or an assignment. The atmosphere was inviting and comfortable, with both school library media specialists addressing individual students by name to ask if they had been able to find what they needed. Attractive and framed, student artwork was displayed around the room. Especially interesting was the display of colorful self-portraits.

Having been recently redecorated, the school library media center was attractive and bright. Contrasting squares of carpet placed randomly around the room gave an artistic feel to the room (the school library media specialists told me later that these squares actually replaced worn spots in the carpet!). A bulletin board near the entrance highlighted National Poetry month with colorful excerpts of poems. The bulletin board correlated with a celebration of poetry for National Poetry month, and students who came in and recited a poem had their fines deleted. A book display created interest by spotlighting specific titles. As one walked into the library media center, the circulation desk, workroom, and staff offices were to the immediate right and the development office and audiovisual storage rooms were to the immediate left. The ceiling of this area extended the height of both floors. Stairs lending the feeling of a balcony led to the second floor computer lab, which had 30 student workstations. Upholstered and comfortable armchairs provided an inviting reading area in the center of the room. The print collection and eight student computer workstations were on the first floor, as well as a mobile laptop computer lab and sufficient tables and chairs for two classes to work. The school library media specialists also scheduled the English department wireless lab.

A colorful flyer in the library gave the mission of the school and described what was available on the library network: Alexandria (computerized catalog), EBSCO (fulltext magazine and newspaper database), Opposing Viewpoints Resource Center; Gale Databases, Noodlebib (creates MLA Works Cited Page); Turnitin.com (plagiarism detector) Internet/e-mail access, Accelerated Reader (reading comprehension testing), AppleWorks for word processing, Microsoft Word for word processing, Microsoft PowerPoint for presentations, Writer's Helper to identify strengths and weaknesses of

writing styles, and Inspiration for concept mapping and outlining. The library media center provided a video editing station for student and faculty use and circulated digital cameras, laptops, and seven projectors for classroom use. The collection consisted of over 13,000 books, with access to over 400 periodicals. The flyer gave a link to the library's Web site.

The busy life of school library media specialists who have many "other duties as assigned" was immediately evident by School Library Media Specialist C's first task of the morning after students had gone to homeroom. Sponsors of the school's literary magazine, the school library media specialists must see that it is camera ready for publication. School Library Media Specialist C invited the researcher to go with her to the art teacher's room, where she conferred about the upcoming deadline. School Library Media Specialist C presented the researcher with a personal copy of the editions for 2003 and 2004. At the school library media center, Assistant Principal C welcomed the researcher warmly to the school, making the researcher feel that it was an honor for their school's library media center to be chosen as one of the exemplary programs for this research. She had nothing but good to say about the school library media program; it was evident that both school library media specialists were highly respected by her and that their program was considered critical to the learning environment of their school.

Another warm welcome was extended to the researcher when the Principal C came to the library expressly to offer any help that the researcher might need. Principal C mentioned that his school's softball team had met the softball team from the researcher's school more than once at the state championship games. He joined Assistant Principal C in praising the school library media specialists, commenting that his school knew they

had a good school library media program. He, as had Assistant Principal C, made the researcher feel as though she were doing them a favor by choosing their school as one of the sites for the study.

Subscriptions to two software programs had proven to be popular with the faculty. One was Noodlebib, which allowed the creation of a bibliography page in the Modern Language Association (MLA) format. The other was Turnitin, a program that provided a deterrent to plagiarism. Students must submit their papers to Turnitin, which scanned it for terms and phrases that might be plagiarized. Originally implemented by the English department, Turnitin became the responsibility of the library as more and more of the faculty used the program in an effort to prevent plagiarism by students.

The researcher observed the school library media specialists on two days that were not consecutive. During this time, the school library media specialists were interviewed, with the formal interviews taking place on the second site visit. School Library Media Specialist D scheduled the interviews with content area teachers and the administrator for the second visit. Math Teacher C and Science Teacher C were interviewed at a table in the media room, which was a room in the library. Principal C, English Teacher C, and Science Teacher C were interviewed in the equipment room of the library media center, which had a seating area. Both places were private, and the interviewees could feel their answers were confidential.

Content Area Teacher Survey at School C – Private, Parochial School

School Library Media Specialist C and School Library Media Specialist D kept the copies of the content area teachers' surveys, suggesting that they would attach a personal note asking for cooperation for their colleague to study their school library

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media center. They hoped that a personal note would result in more responses. This, in fact, did not happen; the return rate was not better than School A, where the surveys were personally delivered by the researcher.

A total of fifteen teachers (33%) returned the survey at School C, from a total of 45 surveys given out. Five English teachers (36%) returned the survey (fourteen were given out); five math teachers (46%) returned the survey (eleven were given out); one social studies teacher (.09%) returned the survey (eleven were given out); four science teachers (44%) returned the survey (nine were given out).

CHAPTER 5. FINDINGS

For the case study of three selected school library media centers with exemplary programs, four school library media specialists were observed and interviewed, two school principals were interviewed, twelve core content area teachers were interviewed, and a total of 46 core content area teachers returned surveys.

All three of the schools were accredited by the Southern Association of Colleges and Schools, and all four of the school library media specialists were certified as school librarians as defined by the Louisiana Department of Education guidelines. All of the teachers were certified teachers, according to the same guidelines. All four of the school library media specialists were active in their professional organizations, often presenting at conferences. On the Stages of Adoption of Technology Survey, all of the school library media specialists and one of the administrators rated as a 6: they could use technology in creative applications to new contexts. Not all of the teachers were at that level, but only one ranked below a 5, with the others indicating that they could adapt technology to other contexts and/or apply technology to new contexts.

According to the data from this study, interactions concerning technology with both teachers and students were taking place in Louisiana school library media centers. Several recurring themes emerged:

- Interaction between the school library media specialists and the teachers was occurring, but it required work on the part of the school library media specialists. More often than not, this collaboration was informal (conversations with individual teachers rather than planned departmental or curriculum meetings), and much of it centered on technology.

- Technology should be one of the tools used in teaching information literacy skills to students. It was considered critical that students be taught how to use technology resources effectively and responsibility.

- The school library media specialist was considered by teachers and administrators to be the person on campus with the expertise in technology and information literacy skills.

- A comfortable climate was considered important for collaborative activities with teachers of information literacy skills. This non-threatening environment must extend to both students and faculty.

<u>Order of Discussion of Data</u>

Discussion of the data will begin with the presentation of data from the case study of the three selected exemplary school library media programs. Data from the observations of the school library media specialists, along with the data from the interviews of the school library media specialists and selected core content area teachers, will be presented first. Data from the survey of core content area teachers at these three selected schools will be presented next. Finally, data from the survey of members of the Louisiana Association of School Librarians will be presented.

<u>Interviews and Observations of School Library Media Specialists and Teachers</u>

<u>Climate</u>

The school library media centers were busy, and the acquisition of technology seemed to have added to the duties of the school library media specialists. In the midst of all this "busy-ness," the school library media specialists had made their library media centers welcoming. The libraries were attractive and clean.

Students. The quiet library of the past is no longer. Students were allowed to talk among themselves while working on research projects, with friendly but quiet talking among students. In the observation of School Library Media Specialist A, he and English Teacher A, whose students were working on a project, specifically encouraged the students to share with each other the resources they had found for their career assignment. Evidently feeling comfortable, students were constantly asking for assistance with research assignments, with printing, with using the electronic databases, to find print resources, or to check out pleasure reading materials, not only during the class visits, but also in their visits to the library at other times of the day. This climate did not allow misbehavior, however, with School Library Media Specialist A freely admitting that some students felt he was "mean" because he required students to adhere to the school dress code and to have the required hall pass when coming to the library. While he was providing a tour of the campus, School Library Media Specialist A saw a student who was not adhering to the dress code, so he told the student to "tuck that shirt in." However, the request was tempered with a smile and by his calling the student by his name.

Observation of School Library Media Specialist B revealed that students were waiting for her to open the library at 6:15 a.m. in the morning. At lunch break so many students crowded into the library that an additional teacher was placed in there as a duty station to help monitor and assist students at the lunch shifts. In her interview, School Library Media Specialist B stated that she had been out to attend a workshop on the use of PalmQuests in the classroom for a couple of days before one of the observations. Upon her return, a student worker asked her, "Where have you been? My life has been miserable for two days while you were out!" School Library Media Specialist B further

stated that her motto concerning school library media center use by students was: "This is

your library; make sure you use it!" During her interview, she demonstrated a Blackboard

forum she had set up for students to give suggestions for books or make any other contact

with her about the school library media program; she did reply to the students who

offered comments. This library, too, required that students have a hall pass when coming

into the library during class time.

      While observing the school library media specialists at School C, the researcher

noted that both school library media specialists addressed most of the students by name.

When a student came in to use the video editing equipment, frantic because she had lost a

file, both school library media specialists stopped what they were doing to try to help the

student retrieve her information. While waiting for the teacher to come in for the English

I research assignment, both School Library Media Specialists C and D assisted students

in deciding on a topic for their paper. However, misbehavior was not tolerated here,

either; there was a sign posted that reminded students they would be fined $1.00 if they

were caught chewing gum while they were in the library.

      Observation and interview data revealed that all of the school library media

specialists provided individual assistance to students as they worked on research

assignments, with School Library Media Specialist A making sure that he talked to each

student at least twice during the scheduled class visits. School Library Media Specialist A

asserted that today's students "need individual assistance," and he found it more effective

to go from table to table, student to student, rather than deliver whole class blanket

instructions. School Library Media Specialist C and School Library Media Specialist D at

School C talked to individual students before going to the computer lab, making sure

each student had a topic on which information could be found in the library. When in the computer lab and while students were searching for information, these school library media specialists constantly monitored the students and offered helpful suggestions on more appropriate search terms or gently guided the off-task students back to the assignment.

Teachers. The comfortable environment extended to the teachers, who were bringing their classes for research assignments, scheduling classes for future research projects, scheduling checkout of equipment, or asking for assistance in using technology at all three schools. It was apparent that English Teacher A had worked with her school library media specialist on other research projects. In her interview, she confirmed that School Library Media Specialist A and she had worked on projects together since he was "so knowledgeable about technology and could direct her students to so many relevant sources for their research." She further stated that the "wonderful thing" about School Library Media Specialist A was that he was always prepared with resources, not only when her class was scheduled into the library, but also if she were doing a project in the classroom. In his interview, Social Studies Teacher A stated that "the librarians take their job seriously; they will put the material that you need in your hands."

From the observation of School Library Media Specialist B, it seemed as if she were the person to ask at School B when teachers needed something. In fact, the teacher on duty in the library media center at lunch stated that School Library Media Specialist B is "like a mama; she supports, but she also keeps us straight!" In her interview, Math Teacher B could not say enough good things about School Library Media Specialist B:

> Sometimes teachers can't work together with the librarian, but that is not true
> here. School Library Media Specialist B is phenomenal. She never alienates or

isolates herself. She is always busy, but is accessible at any time to give individual help. She develops friendships. I have always had good working relationships [with the school library media specialist], but this is phenomenal.

Throughout both days of observation, School Library Media Specialist B was constantly interrupted. Teachers asked for assistance with printing, a school counselor needed to schedule the computer lab for Advanced Placement testing, a teacher wanted a copy of an article in the local newspaper, and a coach wanted to schedule equipment to show a PowerPoint presentation in the gym. "I can give him a laptop and an Elmo," said School Library Media Specialist B, "but no TV or screen." No matter what the request, School Library Media Specialist B stopped what she was working on (technology report, video order, library circulation report) and cheerfully took care of the request.

Observation at School C revealed the same good rapport with faculty. Teachers and administrators continually came into the school library media center with requests for assistance, either to schedule classes, to return, schedule or use technology equipment, or to get input on a lesson they planned to teach. Sometimes the teacher just wanted to check on them to see how things were going (School Library Media Specialist C's husband was recovering from surgery). Yet neither was too busy to take care of the request. Sometimes they had three classes working in the library at one time – one using the wireless laptop computers, one using the upstairs computer lab, and another using the print sources. In her interview, History Teacher C marveled that "I have never been in a school with librarians like this. They anticipate needs. Anything you ask, you get!" In her interview, Science Teacher C commented:

> The school library media specialists at School C have their fingers on the pulse of the school…I can walk in at any time, and they will stop what they are doing and help me…they make everything so easy. They don't take things for granted, that

you know everything you need to know. I don't know how they can do better. They are very active!

In the interview with English Teacher C, she stated: "They know their job, but also know the school so well. I don't know how they could do better…over and above what I had expected from a librarian."

<u>Principal</u>

When the researcher asked for Principal B's permission to study the school library media center at School B, she readily agreed, saying that their program was "the best." This principal was a former school library media specialist herself, so she knew what constituted a good program. In the interview, she emphatically stated her respect, admiration, and appreciation for School Library Media Specialist B and the excellent work she did, not only for the school library program, but also for the entire school (School Library Media Specialist B was responsible for numerous grants that provided for a computer lab adjacent to the library media center and a wireless lab that circulated, among other things). In her interview, School Library Media Specialist B also sang the praises of her principal, stating that Principal B's hands-on involvement in the school library media program meant that she allocated money to purchase equipment and training that she felt would lead to increased student learning at her school. An example was the implementation of the Accelerated Reader (AR) program. Feeling that reading comprehension skills was an area of needed improvement, Principal B collaborated with School Library Media Specialist B to implement AR with mandatory participation by the ninth and tenth grade students. Principal B, School Library Media Specialist B, and English Teacher B felt that this program had accounted for the increase in reading comprehension scores of eight points on the Iowa Test of Basic Skills.

At School C, there was the same mutual respect and appreciation between the principal and the school library media specialists. In an interview, Principal C stated that "the librarians have always been progressive here; they totally support the teachers. They are the best! We have a great library program, and I also totally support them." Both school library media specialists asserted during their interviews that Principal C did totally support their program, allowing them to implement new programs and buy new equipment as they felt necessary for their students to learn information literacy skills for lifelong learning.

Unfortunately, a tragic health problem of the administrator and then a natural catastrophe precluded the researcher from interviewing the principal at School A. However, School Library Media Specialist A stated that the principal did support the library media program by allocating money to buy new technology equipment and other resources. School Library Media Specialist A also appreciated his principal allowing him to take more than the usual allotted days for his numerous professional activities with national and international library associations and publishers.

<u>Technology and Information Literacy Skills</u>

While all of the school library media specialists and all of the teachers agreed that technology was useful in teaching information literacy skills, they differed on whether or not it was crucial to teaching these skills. Most felt that in our information- and technology-rich society, it was difficult, if not impossible, to separate technology skills from information literacy skills, but a few felt that technology was a useful, but not critical, part of teaching information literacy skills. Yet no one disagreed that technology had become an integral part of the workforce, necessitating that students be taught

technology skills before graduating high school. Each of the exemplary school library media centers studied provided both hardware and software to teachers and students.

<u>Available Technology</u>

School A, the school with the highest poverty rate, offered the least technology access to its students. According to interviews with School Library Media Specialist A, Social Studies Teacher A, and English Teacher A, their students were unlikely to have computers at home. Because the majority of students had not returned their permission form signed by a parent/guardian allowing Internet access, most students could not search the Internet. Access to the Internet was password protected. Students were allowed to use the reference databases under direct supervision and could use the online card catalog whenever they wished. In addition to the Gale Group databases offered to all public schools through legislative funding, School A also offered access to SIRS Researcher and the resources of ABC-CLIO, a reference publisher. The library media center provided eight student workstations. During the observed classes, only honors English students in a pilot program using wireless laptops were accessing the Internet. At School A, a new teachers' technology room in the library media center was just being equipped. The lab provided five computers, scanners, printers, and the professional collection. Teachers were welcome to use the equipment whenever they wished. Social Studies Teacher A commented that he enjoyed using this equipment, which he did not have in his classroom.

Observation at School B revealed that the student permission form was in the student handbook, and the Internet was not password protected, although students must sign in to access the computers. Two computer labs of approximately thirty workstations each were available to students who came to the school library media center. In addition

to the Gale Group reference databases funded by the Louisiana legislature, a grant written by School Library Media Specialist B provided for Geometer's Sketchpad, and the library provided for Noodlebib (a bibliography citation software program). Merit software (designed to improve reading comprehension, writing, vocabulary, grammar and math skills) and Accelerated Reader software (an electronic reading comprehension program) were also provided for students. Interview data from the school library media specialist and teachers indicated that School B provided its teachers with a desktop computer and an AverKey or an Elmo, as well as scanners, digital cameras, and laptops circulated through the library. The English department also had a circulating mobile laptop cart that was obtained through School Library Media Specialist B's writing and being awarded a grant from the Board of Secondary and Elementary Education called the "8g Competitive Grant." At the time of the observation, School Library Media Specialist B and a teacher from each of the core content areas had just returned from a workshop that demonstrated the use of PalmQuest, a handheld computer that has a digital camera, MP3 player, and an eReader. School Library Media Specialist B was considering buying classroom sets for those teachers who wanted them. School Library Media Specialist B's obvious delight with the PalmQuests was shared with several teachers as she demonstrated the equipment.

Interviews with School Library Media Specialists C and D revealed that School C students and teachers were provided access to even more software and hardware than those at School B. In addition to the computer lab and the wireless lab in the library media center, the science and foreign language departments had computer labs that circulated through their departments. All of the teachers had at least one computer in their

classrooms, since they must complete attendance through an automated program. The library media center had seven projectors and three DVD players for circulation. The school library media specialists posted a wish list in the school newsletter, and much of the equipment was bought with donations from parents or other interested community members.

Available on the library network (as described in a colorful flyer in the library that also stated the mission of the school) were Alexandria (automated card catalog), EBSCO (fulltext magazine and newspaper database), Opposing Viewpoints Resource Center, Gale Group Databases, Noodlebib (works cited creator), Turnitin.com (plagiarism detector), Internet/e-mail access, Accelerated Reader (reading comprehension program), Appleworks for word processing, Microsoft Word for word processing, Microsoft PowerPoint for presentations, Writer's Helper (to identify strengths and weaknesses of writing styles), and Inspiration (for concept mapping and outlining). The library also provided a video editing station.

Purposes for Using Library Technology

Interview and observation data revealed that all four of the school library media specialists agreed that the most common purpose for students using the library technology was for research, with English teachers scheduling more visits than other departments. The researcher observed two different English classes at School A. One class was conducting research on selected careers for a documented essay, while the honors English class was beginning research for a literary criticism paper. At School B, English students were completing a WebQuest, the final part of a short story unit that was comprised of a series of assignments including analysis of character, a preliminary paper,

journals, biography, career, and critical commentary. A PowerPoint presentation had to include a critical commentary, audio, pictures from the digital cameras (some students inserted video), and evaluation of project. At School C, English students were beginning research on a selected topic from the Elizabethan era.

As a reminder to the reader, in addition to interviewing the school library media specialist at each school, the researcher interviewed one teacher from each of the core content subjects: English, math, science, and social studies. According to the interview with the math teacher at School B, more of the math teachers used the library's technology because Geometer's Sketchpad was installed on those computers. At School A, the math teacher who was interviewed said she did not use the library technology, partly because she was not technologically "savvy." She did, however, use graphing calculators with her students. The math teacher who was interviewed at School C stated that she had access to a classroom with fifteen computers and Geometer's Sketchpad, so she did not need the library's lab as much. She had, however, scheduled the library's wireless mobile lab four times this year because that lab also had the needed software.

Science teachers also used technology with their students. According to the science teacher interviewed at School A, within the first week of school he always scheduled a time for his students to learn to use the library; a parishwide effort required science teachers to teach science inquiry the first ten days of school. An interview with the science teacher from School B reported she used her NetTV every day and PowerPoint frequently, both for her own and student presentations. She stated that when she had only one computer in her classroom she had used the library technology more often; now she had five computers in her classroom. She still used the digital cameras, scanners, and

video equipment in the library, stating that the students had to go to the library media center for research and to check out the digital cameras. An interview with the science teacher at School C stated that she seldom used the library computers any more because the department had a mobile lab with thirteen computers that students used to gather information for experiments using software and probes.

Social studies teachers reported using the library technology primarily for research projects. At School A, the social studies teacher who was interviewed admitted that sometimes he did not use technology or take his students to the library media center because so many of the students waste time when they are in the library or computer lab. Another problem for him was that so many of his students did not have parental/guardian permission for Internet use, so that limited his ability to do research or projects. At School B, the social studies teacher who was interviewed said that her students used the library technology to gather information for research on a history topic or an event, because "everything else they can do in my classroom." She did, however, use technology with her students for TrackStar assignments, creation of brochures or timelines, and PowerPoint presentations on key figures, topics, or events. At School C, the social studies teacher who was interviewed admitted that she was about to retire and did not consider herself to be technologically literate except to input grades, send attendance records, and use the word processor. However, she did use the school library technology for projects that she and the library media specialists had developed, primarily for research. During their interviews, the school library media specialists at School C listed the purposes their students use their library as the following: online catalog searching of available resources, checking out books for the Accelerated Reader

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assignments, typing papers, finishing homework assignments, copying notes, researching, using productivity tools such as Word and PowerPoint, and searching the Internet.

<u>Is Educational Technology Beneficial?</u>

School library media specialists, teachers, and administrators mentioned the benefits of technology in their schools. Most often mentioned was that technology provided motivation for their students. In fact, while observing the English I honors class working with their laptop computers in the library media center, the researcher did not see one student who was off-task during the two class periods observed. Admittedly, the students had only had the laptops for three days, so the novelty had not yet worn off. Yet this same scene was repeated at School C by sociology students who were using the wireless laptop lab in the library – and these students were accustomed to using the technology.

At School A, the English teacher who was interviewed said that her students felt that "technology is play, not work! Technology allows students to be independent learners. It guides others." At School A, the science teacher who was interviewed believed that technology "absolutely" impacts student learning because the software programs he utilized in his classroom were valuable for reinforcing, as well as teaching, information. At School B, the English teacher who was interviewed changed her former concept of technology as not being beneficial when she realized that technology "opens the door to so many more resources" and that students were so complimentary of the lessons that utilized technology.

Yet in their interviews, the teachers, school library media specialists, and the administrators also emphasized that technology is a tool and should not (in the words of

Math Teacher B) "replace everything; it should be used at the right time." Further elaborating, this math teacher stated that sometimes technology would give the student an answer without the student's understanding of the concept he or she should have learned. As another example, this same teacher stated that she had just attended a workshop presented by PalmQuest, and she felt that there was no use for this handheld computer in high school math. "You must see if technology fits the need, not use it just because it is technology," she stated. The math teacher at School C agreed, stating that there is a danger of over using technology so that students are not learning basic skills. Sometimes students may be challenged to go a little further when using technology since their mistakes are easier to change on the computer than when they are writing the answers, according to the math teacher at School B. English teachers also noted this same positive benefit of making it easier to change mistakes when their students used word processing software to write their research papers. Others mentioned that technology is a hands-on experience that allowed simulations and easy presentation of examples.

According to Science Teacher B, we can "still teach adequately without technology, but it makes the lessons more motivating and better accommodating to students' needs." Both school library media specialists at School C felt that technology should not be the end, but the means to get there.

Information Literacy/Fluency and Technology

All of the school library media specialists, administrators, and teachers who were interviewed agreed that students must be information literate to be successful in our society. What all did not agree on was the importance of technology in teaching information literacy skills to students.

It was perhaps natural to assume that the English teachers, social studies, and school library media specialists taught information literacy skills to their students. Yet in the interviews, it quickly became evident that the other content area teachers felt information literacy skills were also important to their content. When given the definition of information literacy skills as the ability to recognize an information need and to locate, evaluate and effectively use information, the science teachers who were interviewed at Schools A and C quickly said that they taught these skills to their students as the scientific method. The science teacher from School A felt that while technology can be beneficial in teaching information literacy skills, especially in presentation, technology was not completely essential. He further felt easy access to information had made students want the answers handed to them without the difficulty of searching. This was supported by comments from Math Teacher B, who said that she could still teach information literacy skills to her math students without technology (even though technology added to the interest of students), and by Math Teacher C, who said that she did not have to have technology to teach the concepts of math information literacy.

In response to the Information Fluency diagram as discussed in Chapter 2 on page 34 that illustrates the interrelationship of information literacy skills, computer skills, and critical thinking skills (Associated Colleges of the South, 2000), interview data revealed that these results were also divided. School Library Media Specialist A emphatically stated that computer skills were an added component to information literacy and not critical. Perhaps because his students had access to less technology, both at school and at their homes, School Library Media Specialist A was forced to teach information literacy with little technology at times. However, both school library media specialists at School

C felt that students would never reach information fluency without all three components. School Library Media Specialist B felt critical thinking and engaged learning to be crucial to information fluency, and technology "can be a part of that."

Both interview and observation data indicated that all four of the school library media specialists taught their students with guided searches, emphasizing that students were to first search print resources and the reference databases (because they have been evaluated for accuracy, validity, and reliability) before searching the Internet for sources. They felt that students were lacking in effective searching and evaluation tools, often using invalid and inaccurate information just because they believed anything they found on the Internet. In her interview, English Teacher C laughingly told of a student finding a "good" map of the Civil War, only to realize later that it was a map of a park. In their interviews, School Library Media Specialists C and D, as well as a teacher at School C, commented that a social studies student had tried to use content from "Timmy's Webpage," constructed by a fourth-grader. From the observations, it was apparent that all four of the school library media specialists who were studied consistently offered individual assistance to students when teaching information literacy skills such as effective search skills within the context of a scheduled class visit. School Library Media Specialist B told her students, "What you do at home in finding information, I can't help. But here, I can. We will not use invalid or inaccurate information, such as is often found on the Internet."

When asked to respond to the Information Fluency model (as discussed in Chapter 2 on page 34), interview data revealed that teachers also were divided in their answers as to the necessity of computer literacy in the teaching of information literacy skills. All of

the English and most of the social studies teachers agreed that computer skills were a necessity, but not all of the math and science teachers agreed. The science teacher at School C stated in her interview that science is so technology driven that "all three have to come together." However, Science Teacher B found critical thinking steps to be the priority, with information literacy second in importance and technology as the last priority.

School Library Media Specialist B indicated in her interview that all the scheduled visits to her library media center by content area teachers now involved the use of technology. This was affirmed by her teachers. At School A, the English teacher interviewed commented that it was now impossible to separate the teaching of information literacy skills from using technology. In her interview, English Teacher C echoed this sentiment, at first stating that one could teach without technology, but the lessons were not as relevant or practical. Then she stopped and, upon reflection of her words, said, "No, perhaps you can't teach without technology because students must be able to evaluate Internet sources." Also mentioned in the interviews was that students should be responsible in their use of technology. Social Studies Teacher A commented that the biggest problem he had with his students was their copying and pasting and turning in that printed copy, rather than thinking critically about the information and actually writing an original report.

Expertise in Technology and Information Literacy Skills

According to the data collected from interviews with teachers and school library media specialists and from the observations of the researcher of the school library media specialists, the school library media specialists were perceived to be the experts in not

only teaching information literacy skills, but also in technology. All of the school library media specialists were active in their professional organizations, gaining knowledge and adding to their expertise by attending conferences and workshops.

School Library Media Specialist A's resume was fifteen pages long (quite unusual for a high school library media specialist) and documented his many and various professional activities. These ranged from facilitating a conference in the Ukraine to publishing numerous articles in professional journals to presenting at national and international conferences. In addition, he had served on committees for local, state, and national organizations.

School Library Media Specialist B has remained active in the Louisiana Association for School Librarians. Her school library program received an award for being the "best" secondary school library media center in the state in a recent year. She also had presented at several conferences and workshops, as well as taken advantage of the activities provided by the central office in her parish, notably Librarians Learning Together, a Blackboard Course.

Both of the school library media specialists at School C were involved in professional activities. They regularly attend the national conference of the American Association of School Librarians and training offered by the parish public school system. Their parochial school library media specialists group meets four times a year. Both had presented at workshops not only for their faculty, but also at conferences around the state, such as Louisiana Computer Using Educators, National Writing Project, Technology Training Sessions, and the LASL state conference. Their most recent presentations highlighted the importance of making opportunities to interact with the teachers.

The observations revealed that all of the school library media center programs had printed brochures or handouts outlining the available technology at their schools. At School A, both teachers and students were given a newsletter and brochure that explained the reference databases and how they could be accessed. School B had handouts available on a rack in the library media center. School C had a colorful flyer listing the available technology.

English Teacher A stated that she took her students to the library media center with their "new" laptops rather than just having them conduct the research in the classroom because she wanted to take advantage of School Library Media Specialist A's knowledge of information sources, as well as his technical expertise. At School B, the school library media specialist was constantly being asked for assistance with technology problems, ranging from trouble with a printer to glitches with the wireless lab. At School C, both school library media specialists were also kept busy answering questions about technology or assisting teachers with adding technology as a component to their lessons. Because of their expertise, the school library media specialists at Schools A, B, and C offered technology training to their teachers.

According to School Library Media Specialist B, School B teachers were offered many opportunities for technology training, such as an all day training given by the Renaissance trainers for using Accelerated Reader. The parish central office trainers presented technology training with a required portfolio assignment. School Library Media Specialist B and the technology teacher presented technology training on Word, using the scanner, and PowerPoint. Informal training was also provided at times, such as when the principal was considering buying Elmos for whoever wished to use them and a

demonstration site was set up in the library for teachers to get some hands-on training. School Library Media Specialist B said that she used the Library Use Forum of Blackboard to teach lessons when she could find out ahead of time which lessons would be appropriate to the assignments. On the School B Blackboard site, School Library Media Specialist B had posted handouts with Quick Tips for the following topics: Six Trait Writing Rubric, Scanner, Connecting Projector to Laptop, Inspiration, PowerPoint, Digital Cameras, and Technology Tools. She also provided inservice training on United Streaming and use of reference databases.

Interview data from School Library Media Specialists C and D revealed that both of the school library media specialists presented inservices to their faculty, of whom about fifteen had completed INTECH training. School Library Media Specialist C stated, "Teacher education is the key. Students must be taught how to search, but teachers must be taught first." She added that it was unfair to throw technology at teachers without proper training. Both school library media specialists also taught informally, such as the time an inexperienced English teacher was apprehensive about teaching parenthetical documentation. Therefore, Noodlebib was demonstrated to her in an individualized lesson. They offered training in the summer to new teachers and whenever new products or equipment had been added to the library media program.

Interactions of School Library Media Specialists and Teachers with Technology

According to data from observations of the school library media specialists and interviews with school library media specialists and the selected teachers, interactions between teachers and the school library media specialists were occurring with frequency in all three of these exemplary school library media programs, with many of the

interactions involving technology. Print sources, and the school library media centers still had plenty of them, were being used in conjunction with the resources provided by technology. As mentioned above, the school library media specialists were perceived as having technical expertise, so technology had provided an additional avenue of interaction with teachers. Yet all four of the school library media specialists emphasized that collaboration required work on the part of the school library media specialists and some obstacles must be overcome. First, a comfortable environment must be established. Then the school library media specialist must take advantage of any opportunity to interact with the teachers.

School A – Public High School

In the interview with School Library Media Specialist A, he stated that he believed in the collaborative planning with other teachers to teach information literacy skills, and there was evidence of this happening at his school. Teachers scheduled the library media center for research projects, as shown by his calendar. Data from the teacher interviews supported this assertion. He also was a member of the School Improvement Team at his school, which provided another avenue of interaction. Since the School Improvement Plan for that year focused on reading comprehension skills, School Library Media Specialist A attended departmental chair meetings as often as he could. He worked with other school personnel to complete a book order totaling $30,000 from federal funding. These resources would be used in the activities implementing the reading comprehension strategies outlined in the School Improvement Plan. Yet, in spite of all these activities, he still felt that it was sometimes difficult to get teacher buy-in for collaborative planning and teaching. He discussed some possible reasons for this. Perhaps

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some of the faculty liked having complete control of their classes, and by bringing students to the library media center, they lost some of that control. Another reason he listed was that some teachers do not have good classroom management, so he or she is embarrassed to bring the class. Some teachers do not prepare for their classes in advance; scheduling the library media center would require advance planning. Perhaps the primary reason would be that teachers simply did not have time to add projects using library resources since they had so much material they must cover with their classes. This reason was articulated by Social Studies Teacher A as one of the reasons he did not often take his students to the library media center for research projects. The school library media specialist at School A felt that the new teachers' technology room would encourage their use of the library media center and provide more opportunities for interaction with teachers, as well as offer teachers newer technology than most of them had in their classrooms.

School Library Media Specialist A offered some suggestions for ways to foster interactions with faculty, including:

- Go to a teacher and say, 'I know you teach this, but I know nothing about it. Here is a list of resources. Help me choose what to order.' Play dumb!

- Ask a teacher to name the weakest lesson he has and then offer suggestions of how it can be made better using library media center resources.

- Collect assignment sheets from teachers. Share with other teachers, helping them adapt the activity.

- Ask a teacher or administrator to read a book. Videotape the talk and play to students.

<u>School B – Magnet High School</u>

The observation of School Library Media Specialist B and her program revealed almost continuous interaction with the faculty and administration. As mentioned previously, she had just returned from a PalmQuest retreat in order to see if these handheld computers would be useful to her teachers. On both days of the observation, she demonstrated the equipment to various teachers to get their opinions. It was obvious that the teachers respected her technology expertise. Every teacher who was interviewed at School B discussed the grantwriting activities of School Library Media Specialist B, which was responsible for many interactions with the faculty to plan activities.

In the interview with School Library Media Specialist B, she indicated that she had been funded no fewer than five 8g Competitive Grants, as well as other smaller grants. For the most recent 8g grant, English teachers were required to sign a contract that they would meet with the school library media specialist and other English teachers to plan ways to incorporate technology into the curriculum. The teachers had worked with her on completing the grant application, and all of them had worked diligently to fulfill the grant requirements, which required use of the mobile lab, scanners, and digital cameras that had been acquired with the grant funds. Noting that she kept a file of lesson plans and reading lists so that she could give appropriate resources to teachers who needed help with planning an assignment, School Library Media Specialist B commented, "When I read something of interest, I give it to the teachers."

Relating success stories of collaborative efforts with teachers and their use of technology, School Library Media Specialist B noted that she tried to touch a new teacher each year. "I tell them we have technology, so use it!" Supporting School Library Media

Specialist A's assertion that one must sometimes "go after the teachers," she offered as an example a music theory teacher who never came to the library. School Library Media Specialist B told him that she could show him how to make his class interesting by researching a musician. After that, he began scheduling his classes in both the fall and spring for a project involving downloaded music. Then there was the philosophy teacher who saw no need to come to the library, so School Library Media Specialist B said, "Let me help." She introduced him to research involving electronic sources, and he "loved it." Then she went to the chemistry teacher because he never used the library. Telling him that "the technology is here and the new textbooks have lots of technology" was enough to convince him to schedule his classes into the school library media center.

Another area of interaction involved School B's use of the Accelerated Reader (AR) management program that was required for all ninth and tenth graders. Because the program required the reading of print materials, School Library Media Specialist B collaborated with both teachers and students on ordering books and tests for the program.

During her interview, Science Teacher B commented that collaboration with her library media specialist occurred "all the time about technology and how I can use it." She felt that School Library Media Specialist B's taking the time to tell the faculty about the available technology was important because if they did not know it was available, they could not use it. Informal planning seemed more effective for this science teacher; she would plan a lesson and ask the school library media specialist for new ideas to add to her lesson plans. Social Studies Teacher B also planned lessons that included technology with the school library media specialist, such as directed research and creation of brochures or timelines.

Interview data indicated that Principal B ranked collaboration between the school library media specialist and teachers as extremely important, a five on a scale of one to five, with one "unimportant" and five "extremely important." She stated that collaboration did take place at School B, because teachers worked with the school library media specialist to "plan their lessons to incorporate the library resources and technology into the curriculum." She further stated that the benefits of collaboration are "enormous due to the fact that the teachers feed off of each others' ideas and the ideas of the librarians…doors are opened for communication of learning and the students are the ones who are the winners." Stating that technology is well integrated into the curriculum of her school, Principal B commented that the "librarians have taught mini lessons on how to use technology to the teachers on their own time," with these lessons focusing on areas where the teachers needed the help. She also stated that the library media specialist "role models" the use of technology to show the teachers the ease of using technology in the classroom. In discussing the effect that technology has had on the collaboration of teachers and school library media specialists, Principal B felt that collaboration created opportunities for students, as well as opened the doors for teachers to grow and to feel comfortable to communicate with each other as well as the librarians. She credited collaboration with contributing to an increase in the School Performance Score, as well as other test scores, by fostering morale within the ranks of the teachers.

School C – Private, Parochial High School

As at School B, the observations revealed almost continual interactions among the faculty and administrators and the school library media specialists. Within the first few minutes of being at the school, one of the school library media specialists was meeting

with the art teacher concerning the publication of the school's literary publication, for which the school library media specialists were sponsors. The first class period saw two classes scheduled into the library media center. Although the English teacher had not formally planned before bringing his class, he had talked to one of the school library media specialists before scheduling the class visit. In theory, teachers must fill out a request form to schedule the library media center, but often informal conversation served the purpose. The school library media specialists had prepared a guided research handout that required the students to use print sources, reference databases, and finally the Internet, documenting each step of the process.

Observation by the researcher when there was no class scheduled into the library media center revealed that School Library Media Specialists C and D stayed especially busy, delivering technology equipment to teachers, checking out books to students, and checking technology equipment in from teachers. The band teacher returned a projector and stayed to discuss an anticipated assignment using PowerPoint for his Fine Arts survey class. Another teacher came in to look for a folder she had left on the computer cart she had returned, and she stayed to discuss further use of the equipment.

Data from the interviews with School Library Media Specialists C and D revealed that students at School C participated in the Accelerated Reader reading management program, and the school library media specialists stated that this provided opportunity for collaboration with the English department. The English teachers quite readily listened to their suggestions for novels to include on the test database.

Interview data also revealed that formal collaboration most often took place with the department heads; the school library media specialists acted as liaisons between the

department heads. Once a month, School Library Media Specialist C printed a "For Your

Information" flyer containing pertinent information about the media center's resources

for the faculty. Occurring more often and more effective than the formal collaboration,

however, was the informal planning with teachers, with about 95% of the planning being

informal. School Library Media Specialist D commented:

> Either they come in and ask for help or we go to them. For example, after we get back from a conference, we will say, hey, we have a great idea for an English project. Would you mind giving up one of your projects and trying this one? Most often the teacher will respond that she was sick of the old project, anyway!

In her interview, Science Teacher C agreed that informal planning is the most

effective. "I can walk in at any time, and they will stop what they are doing and help me."

English Teacher C complimented the school library media specialists at School C during

her interview:

> Librarians have a lot of influence in all the departments; they pay attention to the whole school and national and local trends…they go to all the departments, looking for holes and will go to that department suggesting how they can help. When they want to start something new, they choose a person who is comfortable with technology, so it will be successful and then other will want to try…I can come in at the last minute with a request, and they will be gracious!

Other examples of interaction were given during the interviews with School

Library Media Specialist C and School Library Media Specialist D. They told of a project

utilizing technology that was developed with the American history teacher when the

school library media specialist went to that teacher and said, "We have a million books

on the Civil War. What can we do?" A chemistry teacher taught a unit on analyzing

painkillers, an idea the library media specialists had brought back from a workshop.

At a conference presentation, these school library media specialists presented their ideas

for promoting collaboration with their teachers. Included in their suggestions were:

- Offering a list of good books to read, along with some apple cider or coffee to drink

- "Read Me Something, Mister" – offering king cake and coffee in the library media center

- Informal presentations offered all day during the teachers' preparation hour to demonstrate new technology (and include food, of course!)

- A colored laminated cardstock "helpline" handout given to all teachers at the beginning of the year that outlined the procedures for scheduling class visits and/or technology, as well as a list of all the software and databases that were available through the library (also on its Web page)

- Creation of student research logs for teachers to give their students to use with their research assignments that involved use of electronic catalog, online databases, or Internet searching.

During the interview with School Library Media Specialists C and D, they commented that they often "go after" those teachers who do not schedule their classes for research. When they realized that two of their English teachers had not yet scheduled classes for their research project for this year, the school library media specialists wrote a memo to the teacher, suggesting a manageable research project (which they had designed) that would teach the students basic research skills. They outlined what they would do for the teacher, such as generating a list of possible topics for the students and making sure they had plenty of resources for those topics. These school library media specialists were convinced that collaboration worked; therefore, they created

opportunities that would offer the apprehensive teachers a safe and comfortable environment to use the technology while teaching information fluency skills.

Data from the interview with Principal C revealed that he felt collaboration ranked extremely high and was, in fact, the key to the strength of the school. Realizing that integrating technology is a slow process, the administrator gave high praise to his school library specialists for their part in training the faculty to utilize technology with their students.

<u>Survey of Core Content Area Teachers – Case Study</u>

<u>Demographics - Teacher Survey</u>

A total of 46 teachers responded to the survey (from all three sites). Of these 46, 16 (35%) were English, 14 (30%) were math, 5 (11%) were social studies, and 11 (24%) were science teachers. Based on her personal experience, the researcher was surprised that more math teachers than social studies teachers returned the survey. At the individual schools, these percentages showed relatively the same percentages, as shown by Table 8.

Table 8. Return Rate by Subject (in percentages)

	Total	School A	School B	School C
English	35	35	36	33
Math	30	24	36	33
Social Studies	11	12	14	7
Science	23	30	14	27

Slightly more than half (53%) of the total number of responding teachers had completed a master's degree. At School A, 53% had a master's degree; at School B, 64% had a master's degree; at School C, 40% had a master's degree. At the individual schools, School B had a more experienced faculty, with 39% having more than thirty years experience, as shown by Tables 9 and 10.

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Table 9. Total Years Experience and Years at School

Number of Years	Years of Experience			Years at Present School		
	Frequency	%	Cum %	Frequency	%	Cum %
1-5	6	14	14	17	38	38
6-10	10	23	37	17	38	76
11-15	12	27	64	5	11	87
16-20	7	16	80	4	9	96
21-25	1	2	82	2	4	100
26-30	1	2	84	0	0	100
31-43	7	16	100	0	0	100

Table 10. Years Experience and Years at Individual Schools (in percentages)

Number of Years	School A		School B		School C	
	Years Experience	Years at School	Years Experience	Years at School	Years Experience	Years at School
1-5	20	38	7	50	13	27
6-10	20	31	22	29	27	53
11-15	27	19	29	0.0	27	13
16-20	27	13	7	0.0	7	7
21-25	7	0	0.0	21	0.0	0.0
26-30	0	0	7	0.0	0.0	0.0
31-43	0	0	29	0.0	20	0.0

Available Technology - Teacher Survey

The school library media specialist at School A commented that few, if any, teachers would not know the technology that was available in other classrooms or labs, or even the school library media center. This proved to be correct because many of the respondents left much of the sections blank if the question concerned equipment in other parts of the campus. Since the analysis of this section would not produce accurate data, the researcher just looked at the technology available in the teacher's classroom. School library media specialists were aware of the technology that was available on their campuses, so this data were not in any way critical to the survey results.

At School A, fifteen of the seventeen respondents reported that they had a desktop computer in their classrooms; one science and one social studies teacher reported having no computer in the classroom. Five of the seventeen reported having projection equipment in their classrooms, with three of these in English classrooms and two in social studies classrooms. Three teachers reported having a scanner in the classroom, with one in an English classroom and two in science classrooms. No one reported having a PDA for the classroom. At School B, ten of the teachers reported having desktops in the classroom, with two English and two social studies teachers reporting no desktop in the classroom. Three teachers reported having a PDA for classroom use, with one each being in English, math, and social studies classrooms. As for scanners, five teachers reported having a scanner in the classroom, with two in English classrooms, two in math classrooms, and one in a social studies classroom. Projection equipment was reported in five classrooms, with one in an English classroom, three in math classrooms, and one in a science classroom. At School C, twelve of the fifteen respondents reported that they had a desktop computer in their classrooms, with two English and one math teacher not reporting a desktop computer in the classroom. Only one teacher, in a science classroom, reported having a scanner in the classroom. Seven teachers responded that they had projection equipment in their classrooms, with three in English classrooms, three in math classrooms, and one in a science classroom.

Use of Library Technology - Teacher Survey

An overwhelming majority of respondents used technology when their students worked on research projects in the library media center. At School A, all of the responding social studies and English teachers reported using technology with all of their

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student research projects, while science teachers reported 80% and math teachers reported 50%. At School B, all of the responding teachers reported using technology with all of their student research projects except for math teachers, who reported 40% of their research projects used technology when they visited the library for student research projects. At School C, all of the responding content area teachers reported technology was a part of their student research projects that were scheduled in the library.

Interactions - Teacher Survey

Data indicated that on average most departments devoted fewer than five times for formal (curriculum or departmental) planning with the school library media specialists. English classes scheduled class visits more often than other subject areas, but these teachers also reported little formal collaborative planning was taking place at their schools. Only the teachers from School C reported collaborative planning more than ten times for the year 2004. Data further indicated that teachers planned informally (short conversations; not a planned meeting) more often than formally.

Technology Impact on Information Literacy Skills and Interactions - Teacher Survey

The majority of respondents felt that technology did have an impact on the interactions between school library media specialists and teachers, as well as on student information literacy skills. However, the results varied site by site. When asked whether technology affected the number and effectiveness of the interactions between the teacher and the school library media specialist, 74% of the total number of respondents replied 'yes.' The majority of teachers at School C (87%) and the majority of teachers at School B (86%) felt technology made an impact on the number of interactions. Just over half of School A teachers believed there was an impact. When asked to explain their answers,

one teacher responded that the expertise of the school library media specialists made them the "final word in what technology we can use to teach our students more effectively." Another teacher stated that the "helpful technological sources/resources" provided by the school library media specialists increased the number of collaborations.

An even greater majority of teachers felt that technology had an impact on information literacy skills. In fact, at all three schools, only five respondents did not think so. When asked to elaborate on their answers, teachers explained that technology was "already the primary tool needed to access information." Others mentioned that computer literacy skills were necessary to become successful in school, in college, and in life after school. Increased motivation for learning by students was another aspect teachers felt was a positive impact of technology, as well as the hands-on experience that is beneficial to learners. Teachers also found technology involved using "critical thinking skills to create and problem-solve."

However, as more than one teacher found, sometimes the impact could be negative if students were not "educated in how to use the information [provided by technology] effectively."

Teachers most often had their students use the library technology to conduct research. The next most common uses were productivity tools such as Word, PowerPoint, and Excel. Other purposes mentioned were scientific or math software, tutorials, and even personal use.

Wireless Environment – Teacher Survey

While most of the teachers did not have access to a wireless environment, those who did were evenly split between those who felt the wireless environment increased the

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number of collaborations and those who felt it decreased the number of collaborations. "I probably have less physical contact with the librarians because we use the wireless laptops in class," said one teacher. Another said, "We do not have a need to go to the library as often." Those who felt the number of collaborations had increased with the use of the wireless labs said they needed both the technical expertise and the information expertise of the school library media specialists.

When asked if the wireless environment had an impact on the information literacy skills of students, the majority noted that students are "more receptive in the learning process because they enjoy the technology."

Examples and Suggestions – Teacher Survey

Only nine of the teachers gave an example of an interaction with the school library media specialist that led to a collaborative lesson using technology. One teacher stated that the library media specialist helped to develop each of her four research projects for that year, with the library media specialist suggesting the technology components. Others mentioned that the school library media specialists always were willing to teach their students the "how to" lessons on effectively conducting online research and using reference databases.

In offering suggestions of methods to increase collaborative opportunities, teachers suggested quarterly departmental meetings for school library media specialists to share new technology with teachers and visits to classrooms as guest speakers. Others focused on the necessity of the school library media specialist having a positive, gracious attitude so that teachers felt comfortable and welcome. Other ideas were an online scheduling system, open communication, and training on the computers and programs.

Using the Stages of Adoption of Technology adapted by R. Christensen (1997), teachers were asked to decide which numbered stage of technology best described their technology use. These stages are (1) Awareness, (2) Learning the Process, (3) Understanding and Application of the Process, (4) Familiarity and Confidence, (5) Adaptation to Other Contexts, and (6) Creative Application to New Contexts. The total mean score for all three sites was 4.9545, indicating that most teachers scored above the Familiarity and Confidence level. The highest mean score among the individual schools was at School C, with a mean of 5.43. School B's mean score was 5.14, and School A's mean score was 4.37. School C also had the highest percentage of teachers who rated themselves at the level of Creative Application to New Contexts, with 57% of the teachers rating themselves at this level. Math teachers at this school felt the most confident, with only one rating himself lower than the top level of adoption. Only 25% of the teachers at School A felt that confident with technology.

Survey of Members of Louisiana Association of School Librarians

The same themes mentioned above were supported in the data received from the survey of members of the Louisiana Association of School Librarians who worked in secondary schools. First, the demographics of the respondents are presented, showing a range of school situations was represented in the participants.

Demographics – School Library Media Specialists (SLMS) Survey

Student population at the schools of the respondents ranged from 250 to 1,960, with a mean of 916.87 and a mode of 1,050. Of the 38 who responded to the question concerning level of education, four reported bachelor's degrees, 29 reported master's

degrees, and five reported a specialist degree. Only one was not certified as a school

library media specialist. Years of experience ranged from two years to 39 years, with a

mean of 18.26. The years at the present school ranged from one year to 31 years, with a

mean of 15.46 years. The number of years of experience was evenly spread, as per Table

11. However, 57% had experience of over sixteen years.

Table 11. Years of Experience and Years at Present School for School Library Media Specialists

Number of Years	Years of Experience			Years at Present School		
	Frequency	%	Cum %	Frequency	%	Cum %
1-5	5	13	13	4	11	11
6-10	6	16	29	11	30	40
11-15	4	11	40	6	26	56
16-20	9	24	64	7	18	74
21-25	3	8	71	1	3	77
26-30	6	16	87	8	21	98
31-39	5	13	100	1	2	100

Available Technology – SLMS Survey

Only three (8%) of the 38 school library media specialists who responded to the

question of whether or not their library had a networked lab reported that their school

library media center did not have a networked computer lab. Of the thirty-six who

responded to the inquiry of the number of computers for student use, approximately 58%

reported 20 or fewer, and approximately 42% reported over 21 as shown in Table 12. The

mean was 19.5.

Table 12. Number of Computers in School Library Media Center for Student Use

Number	Frequency	%
0-10	9	25
11-20	12	33
21-30	8	22
31-50	7	17

Only one of the 37 responding to whether or not their school library media center offered Internet access reported no Internet access. Thirty-four school library media specialists responded to the inquiry of the type of Internet access. Twenty-seven of the school library media specialists, or 80%, reported their access as T-1; 21% reported a DSL connection. Of the school library media specialists who responded, 61% reported other computer labs on campus (other than the business education class computer labs), with 50% of these reporting only one other computer lab for student use other than the business classes, as shown by Table 13.

Table 13. Number of Computer Labs Other than Library or Business Education Classes

Number	Frequency	%	Cum %
1	12	50	50
2	6	25	75
3	4	17	92
5+	2	8	100

The results revealed that 19% of the school library media centers had wireless access, and 35% reported the school library media center housed a wireless mobile cart. Fifteen of the school library media center specialists reported that there were other departments on campus with wireless capability, with approximately 60% of those in the English and math departments, as shown by Table 14. Approximately 12% were in the science department.

Table 14. Other Departments with Wireless

Department	Frequency	%	Cum %
English	3	21	21
Math	3	21	42
Social Studies	1	7	49
Science	2	12	61
Other	3	21	82
English, Science, Social Studies	1	7	89
Science, Math	2	11	100

Laptops were available at many of the school library media centers, with more than 55% reporting at least 16-20 laptops available, as shown by Table 15.

Table 15. Laptops Available

Number	Frequency	%	Cum %
1-5	6	33	33
6-10	1	6	39
11-15	1	6	45
16-20	2	11	56
20-25	3	17	73
26+	5	27	100

For departments on campus with laptops available to students, both English and math accounted for 25% each, with science at a far distant 8%, as shown by Table 16.

Table 16. Departments with Laptops

Department	Frequency	%	Cum %
English	3	25	25
Math	3	25	50
Science	1	8	58
Social Studies	2	16	74
Other	3	26	100

The frequencies and percents related to the two variables concerning the availability of laptops and the departments reflect only those respondents who answered specifically to the item. Over half of the 41 school library media specialists who responded, however, did not indicate a specific choice, which leads the researcher to believe there was a problem with this section of the instrument. Of the respondents, the two tables present the results.

The school library media specialists reported other technology available at their schools besides the computer labs. Out of the 40 participants responding to all other media categories, 24 reported the availability of VCRs, ranging from a minimum of one to a maximum of 25. Sixteen respondents reported the availability of big screen TVs,

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again ranging from one to 25. Twenty-two respondents reported the availability of at least one LCD or Elmo projector.

Thirty-seven school library media specialists responded to the question of whether or not their school used a reading management program. Of the seventeen that responded "yes," nine required students to participate in the program. Accelerated Reader was the most commonly used program, with 80% of the school library media specialists indicating Accelerated Reader was used at their schools. Scholastic Reading Counts was used at 20% of the schools.

Interactions - SLMS Survey

When asked how many times in the current school year (2004-2005) core content area teachers had scheduled classes for student research projects, school library media specialists responses supported the researcher's own experience and that of the data from the content area teachers' survey that English teachers utilize the school library media center's resources more than other content area teachers. Table 17 shows the data that indicated 76% of responding English teachers had scheduled the library for more than sixteen times in 2004-2005, an increase from 60% for the previous year. In contrast, math teachers' visits were far lower, with only 6% having scheduled the library for more than sixteen times in 2003-2004. Responses did indicate that visits by math teachers increased dramatically in 2004-2005, with 51% scheduling for more than sixteen visits. However, 50% of the math teachers scheduled fewer than ten visits. Data for scheduled visits by science teachers were more evenly distributed. Data indicated that 70% of science teachers in 2004-2005 scheduled fifteen or fewer visits to the school library media center. An increase was also seen in the number of scheduled social studies visits: 51% of

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respondents indicated visits of over sixteen times for 2004-2005, while data for 2003-2004 revealed 32% of respondents indicated visits of over sixteen times, as shown by Table 19. Additionally, on average, most departments devoted fewer than five times for formal planning. Data indicated that school library media specialists planned formally the least with math teachers, with 62% of the respondents indicating no formal planning for 2004-2005 with math teachers. The responses for formal planning between the school library media specialist and science teachers indicated that 76% planned formally fewer than five times in 2004-2005. Table 18 shows that more often than not, technology was used with the student research visits.

As can be seen from Table 19, it appears that the school library media specialists devoted the most time to informal planning with the English and social studies teachers. More than 33% of the respondents indicated informal planning with English teachers for 21 times or more in 2004-2005, while approximately 30% of the respondents indicated informal planning with social studies teachers for 21 times or more in the same year. Only 3% of the school library media specialists reported informal planning with the math teachers for more than 21 times in the 2004-2005 school year, and 85% had no planning at all with math teachers. The data indicated that informal planning by school library media specialists with science teachers was also low: 47% with five or fewer informal planning interactions and only14% with 21 or more informal planning interactions.

The majority of school library media specialists (70%) indicated that they used technology to teach information literacy skills, and all of them had access to several reference databases. All of the school library media centers in Louisiana have access to the Gale Group reference databases, as well as World Book Online, and United

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Table 17. Scheduled Visits to the Library Media Center for Student Research Projects (in percentages)

Department	2003-2004							2004-2005						
	None	1-5	6-10	11-15	16-20	21-25	26+	None	1-5	6-10	11-15	16-20	21-25	26+
English	5.0	9	9	6	12	9	49	8	14	3	0	19	5	51
Math	37.1	46	9	3	0.0	3	3	25	22	0	3	11	8	32
Social Studies	25.7	31	9	3	9	3	20	11	11	14	14	16	5	30
Science	14.7	27	21	9	0.0	15	15	19	22	16	14	3	8	19

Table 18. Number of Times Technology Used with Student Research (in percentages)

Department	2003-2004							2004-2005						
	None	1-5	6-10	11-15	16-20	21-25	26+	None	1-5	6-10	11-15	16-20	21-25	26+
English	6	18	6	6	12	12	41	3	22	5	5	11	11	43
Math	33	52	6	3	0.0	3.0	3	34	38	6	6	3	3	9
Social Studies	12	21	9	6	18	6	30	11	26	3	11	14	9	25.7
Science	13	34	16	6	0.0	16	16	14	26	14	9	9	11	17.1

Table 19. Number of Times Planning (in percentages)

Department	2003-2004 Formal Planning							2004-2005 Informal Planning						
	None	1-5	6-10	11-15	16-20	21-25	26+	None	1-5	6-10	11-15	16-20	21-25	26+
English	3	38	11	19	0.0	0.0	5	6	17	17	28	0.0	8	25.0
Math	62	32	6	0.0	0.0	0.0	0.0	42	42	8	6	0.0	3	0.0
Social Studies	35	35	8	16	0.0	3	3	9	26	14	14	14	9	14
Science	38	38	8	14	0.0	0.0	3	11	36	17	14	8	6	8

Streaming (provided with state funding). Other databases mentioned were Grolier Online,

EBSCO, History Reference Center, SIRS Researcher, Bridges/Careers/Choices,

DISCAuthor, DISCBiography, DISCMulticultural, DISCScience, DISCU.S.History,

DISCWorld History, and Masterplots.

Technology and Information Literacy Skills - SLMS Survey

When asked to describe in what ways technology was used to teach information

literacy skills, one respondent commented, "Every project involves these skills." Another

commented that she did "necessary day-to-day instruction" as well as an extensive library

orientation for all incoming freshmen that included use of word processing, PowerPoint,

Internet, and reference databases. All of the respondents taught electronic reference

databases and effective Internet searching skills. Other technology tools mentioned were:

desktop publishing, word processing, PowerPoint, Accelerated Reader tests, WebQuests,

evaluation of Web pages, citation of sources, and online card catalog. "We incorporate

information literacy/fluency skills into pathfinders and scavenger hunts, particularly in

social studies and English," commented one respondent. One school library media

specialist stated that she had created "published guidelines for the construction of

PowerPoint presentations" and that the librarians taught and assisted upon request with

any research project that involved technology. Another commented that production tools

were more likely to be taught one-on-one as the need arose. A common thread throughout

all the comments was that technology skills were incorporated into almost all research

assignments, or as one respondent said, "everyday, hands-on." The school library media

specialists also mentioned collaboration with "teachers before they finalize assignments."

School library media specialists also used technology to create presentations to use in

teaching information literacy skills. "[I] collaborated with students to produce a fourteen-minute interactive CD using 'agent' characters…to deliver the orientation message to all freshmen and sophomore classes." This same school library media specialist used Publisher to develop a trifold handout describing her library's mission, services, inservices, technology tools, and useful Web sites.

Uses of Library Technology – SLMS Survey

Just how are students using the technology provided by school library media centers? According to the school library media specialists, the primary reason is for research on the Internet and in reference databases, followed by productivity tools (such as Word, PowerPoint, Publisher). Other purposes listed were instructional programs such as SkillsTutor, virtual science projects, and other school assignments. Also listed were accessing the online card catalog, taking Accelerated Reader tests, accessing teachers' homepages, e-mailing, and personal interest Internet research. While one school library media center indicated that students were not allowed to play games, another listed music/game/chat rooms as the number one purpose of student access to library technology.

Successful and Unsuccessful Collaborative Efforts – SLMS Survey

When asked to describe the success of attempts to work with teachers to plan lessons using technology for student research projects, more school library media specialists (31%) felt their efforts were quite successful than that their efforts had failed (11%). Others described their efforts as successful (22%) or limited (11%). Several of the school library media specialists indicated that some of the teachers were still resistant, with one respondent stating that, "I have had much more success in volunteering to assist

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in the projects they already have planned." One of the school library media specialists commented that "when teachers collaborate with us, the students do better with assignments." One school library media specialist lamented that "teachers welcome my help, but there is not much time to do so." Yet another respondent was unhappy, feeling that "the teachers at this school view me as a babysitter and one who has an 'easy' job." English teachers were listed as the ones who collaborated the most, and school library media specialists would like to "see the math department more."

When asked to describe any failures in attempts to work with teachers to plan lessons using information technology for student research projects, several responded that there were teachers who just did not want to be "bothered" to collaborate or learn to use technology, perhaps because of fear of technology. To alleviate this fear, one suggestion was to conduct formal workshops. However, one school library media specialist felt that whole group instruction to faculty was not effective, finding that targeting individual teachers worked best. Another reason for failure of collaboration with teachers on lessons involving technology was that teachers were often overwhelmed by "curriculum, testing, and extra duties" so they do not have time. Two school library media specialists commented that they have to teach classes themselves, so their time for collaborating is further limited. Another theme that ran through the responses was that teachers did not allow enough classroom instruction in the necessary skills for the assignment: "Teachers want to devote class time to students doing the research, rather than teaching them the process first."

The most common reason school library media specialists felt they had failed in working with teachers to plan lessons using technology was that too many teachers felt

that Google searches could provide all the research information students needed, so teachers did not feel the need to plan when they could just bring their students to the library to "do research." The school library media specialists suggested that teachers should require use of reference databases, or at the very least, written evaluations of any Web site students use in their research, which should include higher order thinking skills rather than just factual information in a report.

Examples of Interaction That Led to a Collaborative Lesson – SLMS Survey

The researcher found it interesting that even though this question was not worded to include technology, that all of the respondents made that connection. Of the 35 school library media specialists who responded to this question, 34 mentioned a specific content area. The percentages of the different content areas represented support the findings of those in Table 20; English (44%) was the most represented. A surprising finding in this section was that science lessons (26%) were mentioned slightly more often than social studies (24%). No math lessons were listed; however, there were two foreign language lessons and one special education project discussed. Responses ranged from teaching skills for the research paper to WebQuests to making a scrapbook of information found from print and electronic sources. One library media specialist made a bookmark of poetry Web sites for National Poetry week; this turned into a project with two English teachers that culminated in the creation of a brochure. Other examples of teacher/school library media specialist collaboration using technology to research, evaluate, and present included:

- Biology research projects on endangered species
- Physics research projects on weather patterns

- English research project on diseases

- Social studies WebQuest on ancient civilizations

- Chemistry 'ad campaign' for an assigned element

- Biology unit on ecosystems.

Impact of Technology on Collaborative Efforts in the Research Process – SLMS Survey

School library media specialists were asked to indicate the degree on a scale of 1 "strongly disagree" and 5 "strongly agree" with which they felt technology had fostered collaborative efforts with core content area teachers in the specified steps of the research process as defined by the *Guidelines for Library Media Programs in Louisiana Schools* (Louisiana State Department of Education, 2004). As shown in Table 20, the majority agreed that technology positively affected collaboration with core content area teachers in teaching information literacy skills to students. The average standard deviation range of .65 to 1.15 shows little variance between participant responses. However, the highest scores were in Presenting Findings, where 92% rated this variable as "agree" or "strongly agree." The next highest scores were for Selecting Tools and Resources, where 78% ranked this variable as "agree" or "strongly agree." Only 44% responded to "agree" or "strongly agree" that technology affected collaboration for Evaluating Efforts.

Table 20. Technology in the Steps of the Research Process, Louisiana Model (in percentages)

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Defining/Focusing	3	3	27	41	27
Selecting Tools and Resources	3	5	13	27	51
Extracting and Recording Information	3	5	15	38	35
Processing Information	3	11	19	38	30
Organizing Information	3	5	27	32	32
Presenting Findings	0	0	8	38	54
Evaluating Efforts	5	11	38	19	25

An overwhelming majority of the school library media specialists not only were confident when using technology, but they felt they could integrate technology into the curriculum.

Wireless Impact - SLMS Survey

Apparently, few of the schools represented by the respondents have wireless capability, or else the capability is too new for the school library media specialists to assess its impact. There were only nine responses to the question of the impact of wireless labs on school library media specialist/teacher collaboration. Respondents were evenly divided in their perception of the impact of wireless labs in other departments on their campuses. Three indicated no change in collaboration, three indicated increased collaboration, and three indicated decreased collaboration. Those who indicated decreased collaboration cited the fact that the departments who had their own computer labs seldom brought the classes to the school library media center (this has been the experience of the researcher and is supported by data from the content area teacher surveys). They noted that school library media specialists were better equipped to teach the information literacy skills than the classroom teachers. Those school library media specialists who noted a positive impact indicated that they assisted other departments as they used the laptops for research projects.

When asked if they felt wireless labs in other departments had an impact on student information literacy skills, again there were varying opinions. Some felt student learning of information literacy/fluency skills was greatly increased, because students "use [computers] on a regular basis in other disciplines." Another expressed a concern that teachers were not teaching the "same information literacy standards that we cover."

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<u>Importance of Collaboration in the Use of Technology to Teach Information Literacy –</u>
<u>SLMS Survey</u>

School library media specialists were asked to rate on a scale of 1 "unimportant"

to 5 "extremely important" how they perceived the importance of librarian/teacher

collaboration in the use of technology to teach information literacy skills. As indicated by

a mean of 4.37, school library media specialists overwhelmingly rated collaboration as

"very important" (32%) or "extremely important" (54%).

<u>Suggestions for Activities to Increase Collaboration in Integrating Technology – SLMS</u>
<u>Survey</u>

School library media specialists were asked to give suggestions for activities that

would increase collaboration between teachers and school library media specialists in

integrating technology into the information literacy curriculum. Twenty-two school

library media specialists replied to this question, and their responses were easily grouped

into these areas: public relations (getting message to faculty), staff development, allotted

time for planning, administrative support, mandatory projects for all content areas,

professional development of school library media specialists, and leadership of school

library media specialists. The area of public relations was mentioned most frequently,

followed closely by training of staff, and then allotted time and administrative support. In

the area of public relations, one school library media specialist stated "constantly making

teachers aware of how we can help them (and sneaking in the idea of using technology to

the reluctant) is probably the most important thing we do." Another phrased it like this:

"Continue banging on their doors…Telling them about new information and volunteering

to help." Others suggested using food as a lure, such as coffee in the morning, and others

suggested an open house to showcase the available technology and to suggest projects.

Staff development activities included mini-workshops at faculty meetings and library orientation for faculty (especially for new teachers). One respondent suggested that "librarians have to cultivate their relationships with administrators and encourage and educate them so that they will require this integration."

Stages of Adoption of Technology – SLMS Survey

Finally, school library media specialists were asked to respond to the Stages of Adoption of Technology survey (see Appendix B), which asked respondents to choose the stage which they believe corresponds to their adoption of technology in the educational setting. As can be seen in Table 21, an overwhelming majority of the school library media specialists not only were confident when using technology, but they also felt they could integrate technology into the curriculum. Although this percentage may seem high when compared to other educators, school library media specialists are forced to use technology if they are to keep up with the available resources for research.

Table 21 Stages of Adoption of Technology of School Library Media Specialists

Stage	Frequency	Percent
1: Awareness	0	0
2: Learning the Process	0	0
3: Understanding and Application of the Process	0	0
4: Familiarity and Confidence	4	11
5: Adaptation to Other Contexts	8	22
6: Creative Application to New Contexts	25	68

Summary of Findings

Data revealed that interactions between school library media specialists and teachers concerning the use of technology to teach information literacy skills were occurring at the three selected exemplary school library media centers and in the school library media centers of the respondents to the Louisiana Association of School

Librarians survey. However, there were barriers that sometimes prevented collaboration from occurring. Climate in the school library media center was felt to be crucial to collaboration. Therefore, school library media specialists must work to create a comfortable and non-threatening environment. Technology should be only one of the tools used in teaching information literacy skills to students, and computer literacy skills were perceived as increasingly important in this effort. According to the data from the surveys, interviews, and observations, teachers perceived the library media specialist to be the person with expertise in both technology and information literacy on their campuses, thereby necessitating involvement in continuing professional development.

CHAPTER 6. RESULTS, RECOMMENDATIONS, AND CONCLUSIONS

Based on the findings presented in Chapter Five - Findings, the following best practices have emerged among the school library media specialists and their programs. All of these best practices demonstrate interactions with teachers, administrators, and students in their efforts to teach information literacy/fluency skills. These interactions most often relate to information technology and its use as an educational tool. By following the practices of these four school library media specialists and the data from the comments and recommendations of the other participants, educators can initiate a change of practice to improve school library media programs that are not successful in teaching and utilizing information fluency skills. The results of the study, however, reflect the circumstances and personnel at the schools that were studied and may not be generalizable to other schools without those same circumstances and personnel.

Four key themes of best practices emerged from the data. These themes are:

- School library media specialists consider themselves as educators first

- School library media specialists are leaders and visionaries who model lifelong learning

- School library media specialists are committed to acquiring, utilizing, and promoting new technologies,

- School library media specialists consider technology as one of the tools to teach information fluency, although an increasingly important one.

Educators First

Across the three schools, the four secondary school library media specialists, and participants in the surveys, data indicated that school library media specialists think of

themselves first as educators. There was a shared belief among them that they could make a difference in their schools by actively contributing to the process of teaching and learning. Of utmost importance to this effort was a comfortable climate for both faculty and students, who must feel welcomed in the school library media center before learning can take place. All of the school library media specialists in the case study had created an attractive physical environment, but they were also aware of the environmental and personal factors that affect collaboration with teachers. These findings support the work of Branch (2004), who lists "departmental support, time for collaboration, and the public nature of collaboration" as adding to the stress and support of collaborative activities.

<u>Leaders and Visionaries</u>

The school library media specialists in the current study were leaders and visionaries, impacting the stakeholders at their schools by modeling lifelong learning in their interactions with students, administrators, and faculty. Often the school library media specialist finds him/herself leading from the middle since he or she is on the same level as the faculty (AASL & AECT, 1998), yet often training the faculty. The practices of the school library media specialists in the current study revealed their leading while still maintaining a comfortable relationship with their teachers.

These findings support the contention of Georges (2004) that school library media specialists have the "opportunity to positively impact the academic lives of all members of the school community" through professional development, library programming, membership in library and technology associations, and grantwriting. Committed to continuing education for themselves, the library media specialists in the current study encouraged their teachers to continue learning by offering and teaching technology

inservices. All of them kept up with the current library literature, with one being a prolific writer of this literature himself.

New Technologies

According to data from the case study and survey participants from this current study, the school library media specialists were committed to acquiring, utilizing, and promoting the use of new technologies. Internet access had become standard for most schools (NCES, 2005), but the newer technologies were not as prevalent on their campuses. Because technology is expensive and funding is always a problem, the school library media specialists gained administrative support to obtain technology, as well as to educate the faculty on methods of integrating the technology into the curriculum of the school. All of the school library media specialists took advantage of sources outside the school to obtain technology, such as grantwriting opportunities and "wish lists" to donors.

At workshops, retreats, and presentations at conferences, these school library media specialists learned of technological advances and methods of integrating technology into the classroom. After obtaining the technology, the school library media specialists trained their faculties. This finding supports that of a technology survey (Brewer & Milam, 2005) by *School Library Journal*, which reports that 84% of library media specialists train teachers in technology-related skills.

The school library media specialists in the current study tirelessly publicize their programs through bookmarks, instructional handouts, flyers, brochures, and individualized interactions with faculty, students, and administrators to promote the latest technologies available for teaching and learning.

Technology as a Tool

School Library Journal's Technology Survey (Brewer & Milam, 2005) reports that most of the technology activities of school library media specialists "directly impact student achievement" (p. 5) by training students to use technology resources to locate information, providing technology training to both students and teachers, and collaborating with teachers to integrate information literacy and National Educational Technology Standards. Data from the current study supports the findings from this survey.

Realizing that technology has become a vital part of our information society, the school library media specialists in the case study, as well as the participants in the survey, were committed to using technology as a tool to improve the critical thinking and information literacy skills of their students. All four of the school library media specialists in the case study were willing to provide training to their teachers not only on technology skills, but also on integration of technology into their lessons so that students would learn to locate, utilize, evaluate, and present information (Asselin, 2003). Their methods agree with a model by Sundar (2004) who finds constructivism has "obvious links to technology" (¶15). His model calls for students to access information using technology, evaluate the information using information literacy skills, and construct meaning from both the information and the process of obtaining the information.

Providing continuous individual and whole group assistance, the school library media specialists were diligent in requiring students to evaluate their information sources for validity, reliability, and accuracy, especially those sources found on the Internet. Print sources were not left, however. All four school library media specialists from the case

study required students to first search for sources from the print collection, then from the reference databases, and finally from the Internet.

Recommendations for Promoting Information Fluency in Secondary Schools

Based on the findings of the current study, the following recommendations will ensure that students leave our high schools with the necessary information fluency skills to succeed in this information- and technologically-rich world. The findings could also be used as a blueprint for administrators as they rethink and redevelop schools that were impacted by Hurricanes Katrina and Rita that devastated south Louisiana in 2005.

Principal Support

Principal support of a school library media program is crucial (Hartzell, 2003; Lindsay, 2004). Principals must realize that the school library media specialist is an education leader and has the power to improve the information fluency skills of students and faculty by becoming the information fluency liaison between the faculty and the students, between the various content area teachers, and between the administrator and the faculty. Therefore, principals should take care to choose a school library media specialist who can promote not only the school library media program, but also the lifelong learning skills (including information fluency skills) students need to survive in our society.

Self Promotion of Program

School library media specialists must self promote their programs. If they do not know what the school library media program has available, then the faculty and students cannot benefit from its resources. Becoming instructional consultants (Turner and Riedling, 2003) in their interactions with teachers, the school library media specialist can

build a program that impacts learning at the entire school. School library media

specialists must be active in pursuing interactions with teachers, such as offering to take

the teachers' weakest lesson and make it better with technology and library resources.

They should also make certain that their principals and supervisors know of the empirical

studies that associate student achievement with effective school library programs.

Time and Support

Collaboration with teachers requires time, so school library media specialists and

teachers should be given time to plan collaboratively. Many interactions are informal

conversations at the time the teacher schedules the activity; however, time for more

formal planning could result in more effective lessons that teach information fluency.

School library media specialists also should be provided with the clerical and technical

support so that these duties do not take time away from their professional role.

To gain this support, school library media specialists at the local level should

begin collecting and analyzing data that documents the effectiveness of their efforts

(Lange & Montgomery, 2003). This data should be used to identify goals of the library

media center, inform stakeholders, obtain funding, and develop a school improvement

plan that includes the resources of the library media center (Young, 2005).

Engaging Students in Their Learning

Students who are actively engaged in their learning show increased academic

achievement. Since students are motivated by the use of technology, school library media

specialists should work to integrate technology into the information fluency curriculum.

This integration requires collaboration by the school library media specialist and the

classroom teachers to see that information fluency skills are taught as relevant to the

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content of the various disciplines. For this to happen, school library media specialists

must "speak the language" of the teachers, such as connecting the steps of the Louisiana

Information Literacy Model for Lifelong Learning to the steps of the scientific process, to

content area standards, and to state and national conference standards.

Professional Growth

Continuing education is a necessity in a profession that utilizes such rapidly

changing resources. School library media specialists should be active members of

professional organizations as well as attend and present at conferences, workshops, and

retreats. Redelivering this information to their colleagues and faculty should be a

standard practice.

Implications for Information Fluency Model Development

Research of the information literacy skills literature reveals many information

seeking process models, such as the Big6 (Eisenberg, 2003), The Information Seeking

Process (Kuhlthau, 2004), Information Literacy Model (Loertscher, 2000), The Research

Cycle (McKenzie, 1997), and the Louisiana Information Literacy Model for Lifelong

Learning (Louisiana State Department of Education, 2004). Several researchers have

developed models that add technology as a necessary part of the information seeking

process. Annette Lamb (2004b) feels that our technology-rich environment means a

change from teaching information literacy skills to ensuring students are information

fluent. Using the analogy of a keystone, she created The Technology Keystone, a model

(see Figure 6) in which information fluency is made up of Thinking, Reading, and

Technology skills. Danny Callison (2003) developed a model for Selected Interactions

and Relationships Defining Information Fluency (see Figure 6), with critical thinking and

creative thinking as major components of information fluency. He also includes literacy skills, learning techniques, strategy selection, evaluation levels, and communication levels. The Associated Colleges of the South Information Fluency Project Task Force (2000) developed an Information Fluency model (see Figure 6) that shows the interrelationship of information literacy, computer literacy, and critical thinking to information fluency, with information fluency as the area where information literacy skills, computer literacy skills, and critical thinking skills overlap.

Data from the current study on the best practices of the selected exemplary school library media programs supports the inclusion of technology as a part of the information literacy process in an information- and technology-rich society. Further data from the current study indicate that in secondary school settings collaborative activities between the school library media specialist(s) and teachers to develop curriculum is important to student learning of information fluency skills. Therefore, based on data from the current study, as well as a study of the current information literacy/fluency literature, the researcher has developed the Integrated Model of Information Fluency for Student Learning (see Figure 7).

In the Integrated Information Fluency Model for Student Learning (see Figure 7), school library media specialists collaborate with teachers to produce a curriculum that incorporates information literacy skills (defining/focusing, selecting tools and resources, extracting and recording, processing information, organizing information, presenting findings, evaluating efforts), reading comprehension skills, technology skills, and critical thinking skills across the curriculum. Effective planning will ensure that information fluency skills are integrated into the curriculum of the school. After planning the

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curriculum, school library media specialists and teachers should cooperatively teach the lessons to students within the various content area subjects, rather than as isolated units of instruction.

Since teachers themselves must sometimes be trained to become information fluent, the model is interactive, with a cycle of learning from the school library media specialists to information fluency and then back to teachers. Successful teaching of the components of information fluency (information literacy skills, critical thinking skills, reading comprehension skills, and technology skills) leads to the ultimate goal of student learning of these skills. Information fluent students are students who are better prepared for life after high school, so it is imperative that these skills be taught in our schools.

How Does This Model Differ?

Figure 6 illustrates the three models from which the Integrated Model of Information Fluency for Student Learning emerged. Lamb's Information Fluency Model (2004b) includes critical thinking, reading, and technology skills, all of which have been incorporated into the Integrated Model of Information Fluency for Student Learning. From Callison (2003), the following components were incorporated from his model of Selected Interactions and Relationships Defining Information Fluency: critical thinking and information literacy. These are shown in bold text in his model, which is shown in Figure 6. The Associated Colleges of the South Information Fluency Project Task Force Report (2000) includes information literacy skills, critical thinking skills, and computer literacy skills in its model, all of which are incorporated into the Integrated Model of Information Fluency for Student Learning. Figure 6 allows a comparison of these three models.

Lamb's Information Fluency Model   Associated Colleges of the South Model
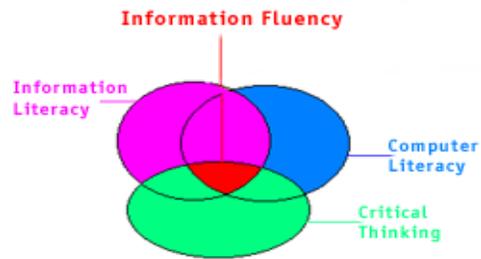
Reprinted with permission   Reprinted with permission of Marcia Poggione

Callison's Selected Interactions and Relationships Defining Information Fluency

Reprinted with permission

Need Analysis:

**Critical
Thinking**

- Academic
- Personal
- Workplace

Literacy Skills:

- Computer
- Information
- Media/Mass Communication
- Reading/Writing/Speaking

Learning Techniques:

- Guided
- Student-centered
- Constructivist

INFORMATION
FLUENCY

Strategy Selection from Models:

- Problem-solving
- Human sources/ personal
- In-depth information search process
- New questions & inquiry

Evaluation Levels:

- Formative or summative
- External or internal personal
- Written, spoken, recorded
- Checklist, journal, portfolio

Creative
Thinking

Communication Levels:

- External audience or internal self
- Entertain or inform

Figure 6. Comparison of Three Information Fluency Models

School Library Media Specialists ↔ Teachers

Curriculum

Information Literacy Skills | Critical Thinking Skills | Reading Comprehension Skills | Technology Skills

Information Fluency

Student Learning
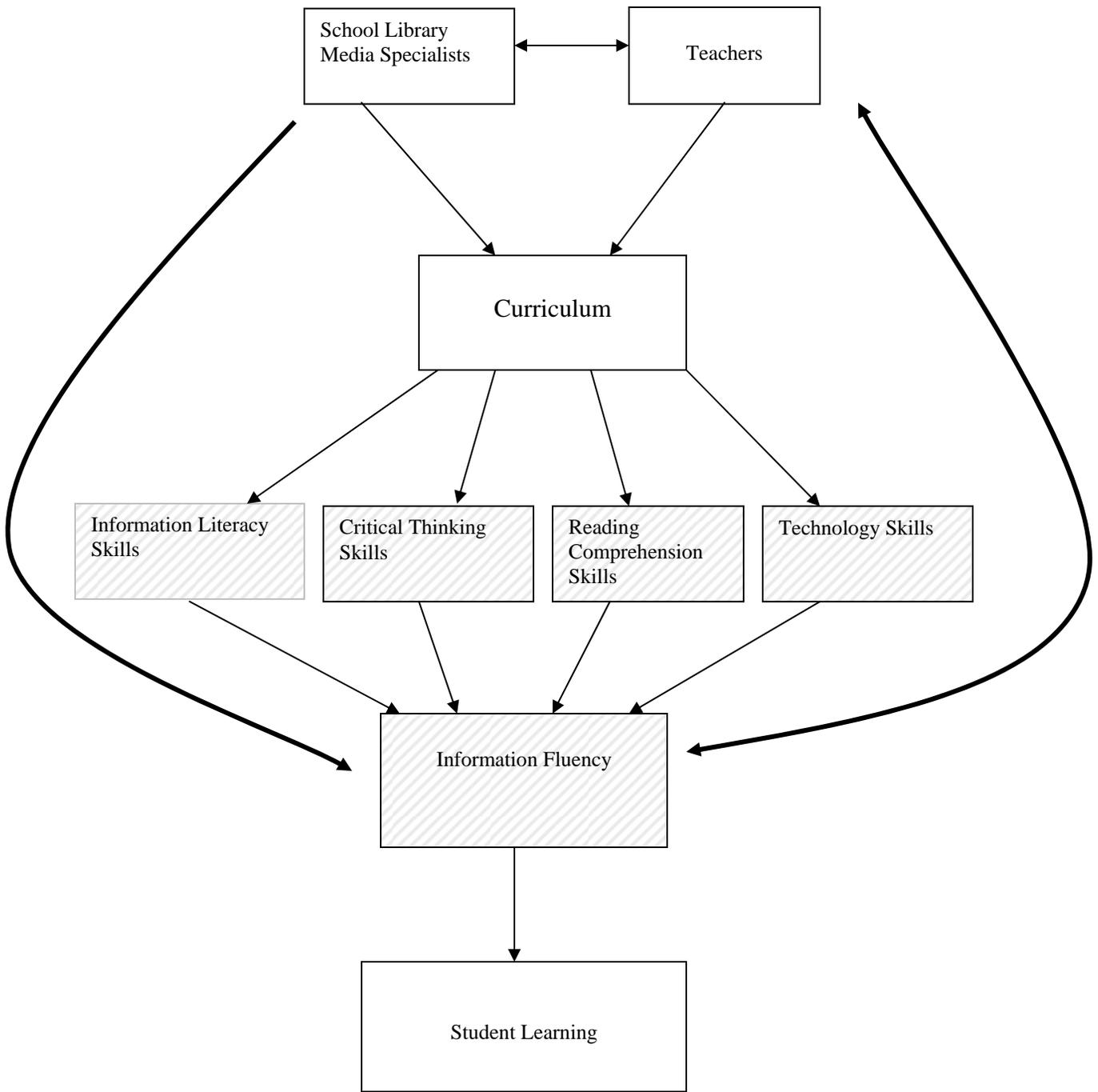
Figure 7. Integrated Model of Information Fluency for Student Learning

The Integrated Model of Information Fluency for Student Learning (see Figure 7)

includes some of the components of the Information Fluency Models discussed above.

These components are: Information Literacy Skills, Critical Thinking Skills, Reading

Comprehension Skills, and Technology Skills (represented in shaded boxes in Figure 7).

The researcher has added other components. Because the teaching of information fluency

skills should be integrated into the curriculum of a school for optimum student learning

of these skills, the Integrated Model of Information Fluency for Student Learning

includes the collaboration of school library media specialists and teachers in developing

the information fluency curriculum (represented in the unshaded boxes in Figure 7). Also

unique to this model is the interaction between school library media specialists and

teachers with information fluency skills, as well as the representation of the desired

outcome as student learning.

<div align="center">Reflections on the Current Study</div>

In retrospect, the researcher would change some aspects of the study in an effort

to obtain better results. Perhaps a better response rate from the survey of the school

library media specialists and the survey of the core content area teachers would have been

obtained had the surveys been shorter. Combining some of the questions would have

made the survey less intimidating and time consuming, yet could still have resulted in

relevant answers. Had a self-addressed stamped envelope been provided to the teachers

for their survey, perhaps it would have been easier for them to return the survey rather

than their returning it to the school library media center or the mailbox of the school

library media specialist. Although teachers are sometimes criticized for not returning

forms required by their administrators (based on the researcher's experience with school

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improvement efforts, conversations with administrators, and conversations with the school library media specialists at the schools), perhaps another visit to the schools to specifically address the non-return of the surveys would have resulted in a better return rate.

One of the school library media specialists commented that some of her teachers had felt intimidated by the consent form since they were not "accustomed" to research. Perhaps a shorter, more concise consent form would have caused less apprehension.

<u>Recommendations for Further Study</u>

From the current study of the interactions of school library media specialists and teachers involving technology in exemplary programs, several questions emerged that warrant further investigation.

- The wireless environment is relatively new to the secondary school setting, so questions about its effect on information literacy skills are still being addressed. Respondents to the school library media survey and the core content area teachers' survey expressed concern that classroom teachers do not have the time or the training to effectively teach information literacy skills as they relate to student searching of the Internet for resources. Respondents felt that the school library media specialist's expertise should be utilized. Since the departments with access to wireless labs seem to be scheduling the school library media center technology less, what effect does this have on the collaboration between the school library media specialist and teachers? A study could look at this lessened contact with the school library media specialist to assess the impact on information literacy/fluency skills of both students and teachers.

- Schools are more and more often being held to accountability programs that are at least partially based on standardized testing scores. All of the school library media specialists in the current study were aware of their school's standardized test scores and they were conscious of ensuring their students were information literate. However, the data did not reveal if they analyzed test scores to look for weaknesses or strengths or if they knew what specific information skills were addressed on the test. A study is needed to investigate the response of school library media specialists to this push for standardized testing. Are the school library media specialists "teaching to the tests"? If so, what are their methods and how successful have they been?

- Data in this study indicated that math teachers and school library media specialists collaborate less often than other core content area teachers. Would more collaboration be beneficial, or does the content of the math courses make collaboration less important than for the humanities classes? A study is needed to investigate the frequency and type of collaborative activities as well as the perception of the math teachers as to the value of such collaboration.

- A study of the relationship between the Stage of Adoption of Technology of teachers, administrators, and school library media specialists at exemplary school library media programs could reveal best practices for technology training of the faculty and administrators. Such a study could also address the need of additional training for those school library media specialists who have not reached the ability to apply technology to new concepts. With the line becoming blurred, or even

erased, between information literacy and computer literacy, it is imperative that

all school library media specialists be competent users and adopters of

technology.

- New technologies (iPods, PDAs, cell phones) continue to become a part of our

    world, and many have potential for increasing the information fluency of our

    students. Yet many schools have policies that preclude student use of these

    technologies at school. A study is needed to see the impact of school policies on

    student use of new technologies by students, as well as to investigate the positive

    and/or negative aspects of using the new technologies in the educational setting.

- The Integrated Model of Information Fluency for Student Learning that emerged

    from the data collected and analyzed in the current study has not been tested. A

    study is needed to test the model with students, teachers, and school library media

    specialists in secondary school settings.

<u>Conclusion</u>

According to studies from at least sixteen states (*School Libraries Work,* 2006),

effective school library media centers that impact student achievement have (a) a

qualified library media specialist, (b) adequate support staff, (c) current and large

collections, (d) access to information technology that is integrated into the curriculum,

and (e) time for collaboration with the faculty. The current study was developed to

explore the role of technology in the interactions between school library media specialists

and teachers. Data revealed that interactions between school library media specialists

and teachers concerning the use of technology to teach information literacy skills

occurred with frequency and in a variety of ways at the three selected exemplary school

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library media centers and in the school library media centers of the respondents of the survey of members of the Louisiana Association of School Librarians. Data further indicated that technology should be used as a tool, with the perception that computer literacy skills are increasingly important in this effort. A comfortable climate in the school library media center is crucial to both collaborative activities of the school library media specialist and the acquiring of information literacy skills by students and faculty. According to the data from the surveys, interviews, and observations, teachers and administrators perceived the library media specialist to be the person with expertise in both technology and information literacy on their campuses, thereby necessitating involvement in continuing professional development. Adopting the practices of the school library media specialists in this study could result in student and faculty learning of information fluency skills that will become a part of their lifelong learning.

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SURVEY FOR SCHOOL LIBRARY MEDIA SPECIALISTS

Part I – Demographics
School Name (optional)
Grades in School (circle all that apply)   1   2   3   4   5   6   7   8   9   10   11   12
Number of Students in School
Are you certified as a school librarian by the Louisiana State Department of Education?   Yes   No
Level of education: <table><tr><td>Degree</td><td>Major</td></tr><tr><td>Bachelor's</td><td></td></tr><tr><td>Master's</td><td></td></tr><tr><td>Specialist</td><td></td></tr><tr><td>Doctorate</td><td></td></tr></table>
Total number of years you have been a school librarian:
Number of years at this school:

Part II: Technology in your library

Please indicate correct response. :

Networked computer lab in library?   Yes   No   If yes, how many computers for student use?
Internet access in library?   Yes   No   If yes, what type? T-1   DSL   dial-up   don't know
Are there other computer labs on campus for classroom teacher use (other than the business and computer labs)?   Yes   No   If yes, how many?
List reference databases available to students:

Do you have wireless computers for student use in the library?   Yes   No
 	
  Do you house a wireless mobile cart for circulation?   Yes   No
  If yes, how many laptops are available to students/teachers?
   none   1-5   6-10   11-15   16-20   20-25   26+

Do other departments on campus have wireless laptops?   Yes   No   If yes, in which department(s)

Other technology available in library (please specify total # available)
   PDA (Palm Pilot, Pocket PC, etc)
   Digital cameras   _____
   Videorecorders   _____
   Projection equipment
     LCD or Elmo _____
     Big screen TV monitors _____

Reading Management Program?   Yes   No
If yes, is it required of students to participate?   Yes   No
Please indicate program:
   Accelerated Reader
   Scholastic Reading Counts
   Other (specify) _____

Part III: Collaboration

For purposes of this study, information literacy is defined as "the ability to recognize an information need and then locate, evaluate, and effectively use the needed information." (from *Guidelines for Library Media Programs in Louisiana Schools,* p. 73)

1. How many times have core class teachers scheduled classes for student research projects in this school year-to-date (2004-2005)?

English	none 1-5	6-10	11-15	16-20	20-25	26+
Math	none 1-5	6-10	11-15	16-20	20-25	26+
Social Studies	none 1-5	6-10	11-15	16-20	20-25	26+
Science	none 1-5	6-10	11-15	16-20	20-25	26+

Approximately how many of these included technology as part of the lesson?

English	none 1-5	6-10	11-15	16-20	20-25	26+
Math	none 1-5	6-10	11-15	16-20	20-25	26+
Social Studies	none 1-5	6-10	11-15	16-20	20-25	26+
Science	none 1-5	6-10	11-15	16-20	20-25	26+

2. How many times did core class teachers schedule classes for student research projects last year (2003-2004) for student research projects?

English	none 1-5	6-10	11-15	16-20	20-25	26+
Math	none 1-5	6-10	11-15	16-20	20-25	26+
Social Studies	none 1-5	6-10	11-15	16-20	20-25	26+
Science	none 1-5	6-10	11-15	16-20	20-25	26+

Approximately how many of these included technology as part of the lesson?

English	none 1-5	6-10	11-15	16-20	20-25	26+
Math	none 1-5	6-10	11-15	16-20	20-25	26+
Social Studies	none 1-5	6-10	11-15	16-20	20-25	26+
Science	none 1-5	6-10	11-15	16-20	20-25	26+

3. How many times, if any, have you formally (i.e., departmental or curriculum meetings) planned with teachers in the core content areas to use technology for student research projects in this year-to-date (2004-2005)?

English	none 1-5	6-10	11-15	16-20	20-25	26+
Math	none 1-5	6-10	11-15	16-20	20-25	26+
Social Studies	none 1-5	6-10	11-15	16-20	20-25	26+
Science	none 1-5	6-10	11-15	16-20	20-25	26+

4. How often have you informally planned (i.e., conversations when scheduling classes with teachers in the core content areas to use technology for student research projects in this year-to-date (2004-2005)?

English	none 1-5	6-10	11-15	16-20	20-25	26+
Math	none 1-5	6-10	11-15	16-20	20-25	26+
Social Studies	none 1-5	6-10	11-15	16-20	20-25	26+
Science	none 1-5	6-10	11-15	16-20	20-25	26+

Part IV: Assessment

Please respond to the questions below.

1. Are you aware that the English/Language Arts test of the Louisiana Graduate Exit Exam 21 includes a section on information skills?   Yes   No

2. Is technology (i.e., word processing, PowerPoint, Publisher, Internet, reference databases) used in your library to teach information literacy/fluency skills? Yes   No

       If yes, in what ways?

3. Do you feel that information technology impacts student learning of information literacy skills?   Yes   No

       If yes, in what ways?

4. For what purposes do your students use the library technology? (Please rank, listing the most common purpose first.)

5. How would you describe the success of your attempts to work with teachers to plan lessons using information technology for student research projects?

6. How would you describe any failures in your attempts to work with teachers to plan lessons using information technology for student research projects?

7. Please give examples of an interaction with a core content area teacher that has successfully resulted in collaborative information literacy lesson(s).

8. Please use the scale as defined below to indicate the degree that you feel technology has fostered collaborative efforts with core content area teachers in the specified steps of the research process as defined by the *Guidelines for Library Media Programs in Louisiana Schools,* p. 73?

   1 = strongly disagree   2 = disagree   3 = neutral   4 = agree   5 = strongly agree

Defining/Focusing	1 2 3 4 5
Selecting Tools and Resources	1 2 3 4 5
Extracting and Recording Information	1 2 3 4 5
Processing Information	1 2 3 4 5
Organizing Information	1 2 3 4 5
Presenting Findings	1 2 3 4 5
Evaluating Efforts	1 2 3 4 5

9. If your school has wireless capability in other departments on campus, how do you feel this environment has affected your interactions with the teachers in those departments?

   On student learning of information literacy/fluency skills?

10. Using the scale as defined below, how would you rate the importance of librarian/teacher collaboration in the use of technology to teach information literacy skills?

    1. Unimportant
    2. Somewhat important
    3. Important
    4. Very important
    5. Extremely important

11. Do you have any suggestions for activities that would increase collaboration among teachers and librarians in integrating technology into the information literacy curriculum?

APPENDIX B
STAGES OF ADOPTION OF TECHNOLOGY

Please read the descriptions of each of the six stages related to adoption of technology. Circle the number of the stage that describes where you are in the adoption of technology.

Stage 1: Awareness
I am aware that technology exists but have not used it - perhaps I'm even avoiding it.

Stage 2: Learning the Process
I am currently trying to learn the basics. I am often frustrated using computers. I lack confidence when using computers.

Stage 3: Understanding and Application of the Process
I am beginning to understand the process of using technology and can think of specific tasks in which it might be useful.

Stage 4: Familiarity and Confidence
I am gaining a sense of confidence in using the computer for specific tasks.
I am starting to feel comfortable using the computer.

Stage 5: Adaptation to Other Contexts
I think about the computer as a tool to help me and am no longer concerned about it as technology. I can use it in many applications and as an instructional aid.

Stage 6: Creative Application to New Contexts
I can apply what I know about technology in the classroom. I am able to use it as an instructional tool and integrate it into the curriculum.

From: Christensen, R. (1997). Effect of technology integration education on the attitudes of teachers and their students. Doctoral dissertation, University of North Texas. Based on Russell, A. L. (1995) Stages in learning new technology. *Computers in Education, 25(4)*, 173-178.

Administrators

- On a scale of 1 – 5, how would you rank collaboration between/among the librarian(s) and teachers?
  1   2   3   4   5

- Do you feel collaboration between/among the librarian(s) and teachers takes place at your school?   Yes   No

  If yes, in what ways?

  If yes, what are the benefits?

- Do you feel that technology has an impact on student learning?   Yes   No

  If yes, in what way(s)?

- How is technology used by students at your school?

- Do you feel technology is integrated into the curriculum at your school?

  If yes, what part, if any, has the librarian(s) played in this integration?

- What effect, if any, do you feel that technology has had on the collaboration between/among librarian(s) and teachers (i.e., creates more or fewer opportunities? fosters student learning?)

Teachers

- Could you tell me about your background and how you came to be a teacher of (core content area)?

- How would you define information technology? Information fluency?

- Do you collaborate with the library media specialist on information literacy skills lessons? In what ways?

- Do you collaborate with the school library media specialist on lessons using information technology? In what ways?

- Do you feel that information technology impacts student learning? In what ways?

- For what purposes do your students use the library computers?

- Give some personal examples of collaborative planning that led to an information literacy lesson.

- How do you assess your students' learning of information literacy skills?

APPENDIX D
SURVEY FOR CONTENT AREA TEACHERS

Part I – Demographics
School Name: St. Thomas More High School
What subject(s) do you teach?
Level of education:

Degree	Major
Bachelor's	
Master's	
Specialist	
Doctorate	

Total number of years you have been a teacher
Number of years at this school

Part II: Technology Available

Please circle the appropriate response:

Scanners
 Classroom   1 2 3 4 5+
 For checkout to classroom (other than
  library)   1 2 3 4 5+

Digital Cameras
 Classroom   1 2 3 4 5+
 For checkout to classroom (other than
  library)   1 2 3 4 5+

PDAs
 Classroom
 1-5 6-10 11-15   16-20 21-25   25+
 For checkout to classroom (other than
  library)
 1-5 6-10 11-15   16-20 21-25   25+

Number of Computers in Classroom
Desktop 1-5 6-10   11-15   16-20   21-25 25+
Wireless 1-5 6-10   11-15   16-20   21-25 25+

For checkout to classroom (other than library)
  Wireless 1-5 6-10   11-15   16-20   1-25   25+

Projection Equipment

Classroom
  LCD   Large Screen TV   Elmo   Other_____
 For checkout to classroom (other than library)
  LCD   Large Screen TV   Elmo   Other_____

Part III: Collaboration

For purposes of this study, information literacy is defined as "the ability to recognize an information need and then locate, evaluate, and effectively use the needed information." (from *Guidelines for Library Media Programs in Louisiana Schools,* p. 73)

1. How many times in this school year (2004-2005) have you scheduled your classes for student research projects in the library?   1-5   6-10   11-15   16-20   20+

How many times did the research project include the use of technology?
1-5   6-10   11-15   16-20   20+

2. How many times have you collaborated with the librarian in planning student research projects that included technology (i.e., reference databases, word processors, PowerPoint, Publisher, Internet)?

This school year (2004-2005)
    Departmental meetings   1-5   6-10   11-15   16+
    Curriculum meetings   1-5   6-10   11-15   16+
    Informal conversations   1-5   6-10   11-15   16+

Last school year (2003-2005)
    Departmental meetings   1-5   6-10   11-15   16+
    Curriculum meetings   1-5   6-10   11-15   16+
    Informal conversations   1-5   6-10   11-15   16+

Part IV: Assessment

Please answer the following short answer questions.

1. Are you aware that the English/Language Arts test of the Louisiana Graduate Exit Exam 21 includes a section on information skills?   Yes   No

2. Has technology affected the number and effectiveness of the interactions between you and your librarian?   Yes   No

    If yes, please explain.

3. Do you feel that technology impacts student learning of information literacy skills?
    Yes   No

    If yes, please explain.

4. When you and your students are in the library, for what purposes do your students use the library technology? (Please rank, listing the most common purpose first.)

5. If your students use wireless laptops in your classroom, how do you feel this environment has affected your interactions with the librarian?

What effect do you feel the wireless environment has had on student learning of information literacy skills?

6. Please give an example of an interaction with the librarian that successfully resulted in a collaborative information literacy lesson.

7. Please provide any suggestions you have that would increase the collaboration between teachers and librarians.

8. Do you have any further comments concerning the use of technology in the library for student learning?

IRB #: A114   LSU Proposal #:_____   Revised: 03/24/2004

LSU INSTITUTIONAL REVIEW BOARD (IRB) for   578-8692 FAX 6792
HUMAN RESEARCH SUBJECT PROTECTION   Office:203 B-1 David Boyd exempted by
Louisiana State University
APPLICATION FOR EXEMPTION FROM INSTITUTIONAL OVERSIGHT Institutional Review Board
203 B-1 David Boyd Hall
Unless they are qualified as meeting the specific criteria for exempt 578-8692
Institutional Review Board (IRB) oversight, ALL LSU research/projects using Mathews, Chair
as subjects, or samples or data obtained from humans, directly or indirectly, with or
without their consent, must be approved or exempted in advance by the LSU IRB. This Form
helps the PI determine if a project may be exempted, and is used to request an exemption.

Instructions: Complete this form.
Exemption Applicant: **If it appears that your study qualifies
for exemption send:**

(A) Two copies of this completed form,
(B) a brief project description (adequate to evaluate risks to subjects
and to explain your responses to Parts A & B),
(C) copies of all instruments to be used. If this proposal is part of a
grant proposal include a copy of the proposal and all recruitment
material.
(D) the consent form that you will use in the study

to: ONE screening committee member (listed at the end of this form) in the
most closely related department/discipline or to IRB office.

If exemption seems likely, submit it. If not, submit regular IRB
application. Help is available from Dr. Robert Mathews, 578-8692,
irb@lsu.edu or any screening committee member.

Principal Investigator Shirley McDonald   Student?_(Y)N

Ph: 225.664.7428 E-mail Shirleymcdonald@bellsouth.net Dept/Unit ELRC

If Student, name supervising professor Janice Hinson Ph:225.578.2280
Mailing Address 26054 Vincent Drive, Denham Springs, LA 70726 Ph_____
Project Title The Role of Technology on the Interactions between School
Library Media Specialists and Teachers

Agency expected to fund project N/A
Subject pool (e.g. Psychology Students) secondary school library media
specialists, core content area teachers, and school administrators
Circle any "vulnerable populations" to be used: (children <18; the
mentally impaired, pregnant women, the aged, other). Projects with
incarcerated persons cannot be exempted.
I certify my responses are accurate and complete. If the project
scope or design is later changed I will resubmit for review. I will obtain
written approval from the Authorized Representative of all non-LSU
institutions in which the study is conducted.

PI Signature Shirley McDonald Date 10-14-04 (no per signatures)
Screening Committee Action: Exempted X Not Exempt ___

VITA

Shirley Benson McDonald grew up in rural south Louisiana, graduating as valedictorian of her small school. She, however, did not begin her higher education studies until her daughter was five. Several years and another child later, she graduated from Louisiana State University with a bachelor of science in secondary education and a minor in library science. A couple of years later she was back in school to complete a master's degree in library and information science. Then several years later she completed an advanced certificate of studies in library science. Just as many of her friends were retiring, she decided to begin the doctoral program in educational technology, and along the way she picked up an educational specialist certificate. She has worked as an English teacher and in both public and school libraries. At the May 2006 Commencement, Shirley will receive a Doctorate of Philosophy degree in Educational Leadership and Research.